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**Dr. Madhu Gupta**  
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## DIGITAL INITIATIVES BY MPKV, RAHURI IN THE WAKE OF COVID -19 PANDEMIC

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**Abstract:**-As the world responds to the COVID -19 pandemic, most Governments have temporarily closed all educational institutions. These nationwide closures have impacted 90 per cent of the world's student population. Localized closures in other countries have affected millions of additional learners. Consequently, there is a transition to distance learning on an unprecedented scale. Institutes are racing to shift their courses online; students are engaging en masse with e-books and e-learning; and researchers are drawing chiefly on electronic journals. As an emergency response, UNESCO has launched the Global Education Coalition to help countries scale up their best distance learning practices. Digital libraries and publishers have risen to the occasion, offering more and more free content and curating personalized collections so that people can continue to read and learn without disruption. Indeed, as the demand for credible e-resources surges, digital libraries have emerged as vital pathways to high-quality e-books, journals and educational content. Devastating epidemics of Covid -19 has significantly changed routine functioning of the society worldwide. Socio-economic conditions of the society have had a great fall down which had been never thought of by anyone. Agriculture Universities are also one of the major affected areas during this pandemic. This paper attempts to study the digital initiative by the Mahatma Phule Krishi Vidyapeeth, Rahuri (MS) in the wake of COVID-19 pandemic.

**Keywords:** - Digital initiative, COVID-19, Jagteplus.com, e-krishishiksha, Krishikosh etc..

**Introduction-**The COVID -19 pandemic has forced governments worldwide to place their countries in full or partial lockdown to contain the spread of the virus. However, these lockdowns came with severe economic and social consequences, which has also presented unique challenges in the educational sector and has forced not just students but also policy makers and service providers including the librarians to adapt and adopt technology as a viable and valuable option to ensure fulfillment of the educational needs of the stakeholders and in overcoming various hurdles in this pandemic time. India, on 30 January 2020, reported its first positive case of the novel coronavirus (COVID -19) from the state of Kerala with a student, who was studying in Wuhan University and had travelled to India (Perappadan,2020). And as a precautionary measure to contain the spread of the virus, Government of India declared closure of all educational institutions across the country from 16 March 2020, which was initially for fifteen days (Times of India, 2020). However as on 10 October 2020 with 6,979,423 positive cases and 107,450 reported death, ("India Coronavirus," 2020) India is one of the worst hit countries and the educational institutions are still closed. Impact of COVID-19 on students: Face to face classroom centred teaching and learning has been now shifted to online learning (Virtual classrooms) with the help of ICT applications. Digital divide need to be addressed to combat this form of teaching learning experience. Teaching faculty has been significantly affected at professional and personal level. Not every faculty finding it easy to deliver the Virtual lectures and disseminate the information. Agriculture Universities and Research Institutions are forced to re-schedule and revise their administrative measures to safeguard education, financial sustainability and to train the human resources to deliver the most essential tasks at this crucial

time. One can witness in the wake the Covid -19 pandemic the emergence of new modes and models of learning, new perspectives and they will definitely continue post Covid -19 as well. Moreover, this pandemic has put the spotlight on the ever -increasing structural imbalances in school education in terms of rich and poor, rural -urban, male-female etc. which lead to digital divide. This situation challenged the ways academic libraries used to function. The suspension of in-person services and loss of access to physical collections at the institutions' libraries has left the students, faculty and library professionals with consideration of adopting the technology which is the only way out to resilience the challenging time. In fact library professionals have demonstrated their skills, empathy and flexibility during lockdown to respond to the rapidly evolving situation. And in such circumstances the website is an essential and dynamic platform to connect and serve the targeted users. Indian Council of Agriculture Research (ICAR), New Delhi is very much keen in drafting new education policy framework and taking utmost care to ensure the right to education for all. Many initiatives have been taken by the ICAR, Department of Agriculture Education, Central and state governments are involved in creating IT to ensure imparting quality education through virtual learning during the pandemic.

**Review of literature:-**The role of libraries in public emergencies has been discussed with much attention in the past. For instance Featherstone and others have highlighted the variety of roles that librarians can play in emergency. Through telephonic and email interviews the authors recorded the stories of twenty -three North American librarians who responded to bombings and other acts of terrorism, earthquakes, epidemics, fires, floods, hurricanes, and tornados. The study reports significant contributions of the librarians towards preparedness and recovery activities of library services surrounding disasters. Zach presents an overview of public libraries' responses to emergencies and discussed how public libraries have provided essential information services during time of crisis . The study suggests that public libraries need to build their position as a trustworthy source of primary information by providing quick and easy access to those patronages looking for information about what to do in an emergency. Tu -Keefner and others have conducted a situation -specific case study to identify health information services and technology access during and after the catastrophic flooding in South Carolina. The study investigated the role played by public libraries as partners of public health agencies during and after a disaster. Focus group meetings and oneon -one interview method was used to get the required data. The study recommended that public libraries should be proactively prepared to provide reliable disaster and health digital resources for adult users (Tu-Keefner, Liu, Hartnett, & Hastings, 2017). Bishop and Veil through their study titled “Public Libraries as Post -Crisis Information Hubs” reports that public libraries played a great role by providing internet access to community members to request aid, to help find missing family and friends, to file insurance claims, and, in general, to begin rebuilding their lives. This article reports the quality of services and activities public libraries performed in response and recovery in two lve different communities impacted by tornadoes.

**Objectives:-**The Primary objective of the study is to find out the facilities and services provided by the MPKV libraries during COVID-19 pandemic through multiple lenses:

- Type of facilities and services provided to the users.
- Mode of dissemination of services during the period.
- Preventive measures taken to combat coronavirus
- Adhoc services introduced

### 1. e-Krishishiksha : e- Learning Portal on Agriculture Education

<https://ecourses.icar.gov.in/>

Education Division undertakes planning, development, coordination and quality assurance in higher agricultural education in the country and, thus, strives for maintaining and upgrading quality and relevance of higher agricultural education through partnership and efforts of the components of the ICAR -Agricultural Universities (AUs) System comprising State Agricultural Universities (SAUs), Deemed to be universities (DUs), Central Agricultural University (CAU) and Central Universities (CUs) with Agriculture Faculty. Under financial support of NAIP, all the e-Course Contents available on this website have been developed by subject matter specialist of the respective disciplines at State Agricultural Universities in India and Deemed Universities of ICAR, New Delhi. The courses material is prepared as per ICAR approved syllabus for the benefit of under-graduate students already enrolled in Indian Agricultural Universities.

## 2. CeRA (Consortium for e-Resources in Agriculture)/ JGateplus.com

<https://jgateplus.com/search/>

J-Gate is an electronic gateway to global e-journal literature. Launched in 2008 by ICAR, New Delhi & Informatics India Limited, J-Gate provides seamless access to millions of journal articles available online offered by 12,759 Publishers. It presently has a massive database of journal literature, indexed from 59,173 e-journals with links to full text at publisher sites. J-Gate also plans to support online subscription to journals, electronic document delivery, archiving and other related services.

a. Table of Contents (TOC) - For 59,173 e-journals.

b. Database - A comprehensive searchable database with 73,396,407 articles, with 10,000+ articles added every day. In the pandemic period ICAR offered remote access facility to the Agriculture Universities for the benefit of students and faculties.

## 3. Krishikosh

<https://krishikosh.egranth.ac.in>

Krishikosh is a versatile open access digital repository catering to the needs of Indian National Agricultural Research and Education System (NARES) and has architecture of centralized hosting (at ICAR-IARI, Pusa, New Delhi) of content but decentralized management. Krishikosh is repository of knowledge in agriculture and allied sciences, having collection, institutional publications, technical bulletins, project reports, thesis, and various documents spread all over the country in different libraries of Research Institutions and State Agricultural Universities (SAUs). As decided by competent authority the item under this repository can only be viewed in viewer, but could not be downloaded. The responsibility for authenticity, relevance, accuracy, copyright and IPR issues of these contents rests with respective organization from where the contents are sourced. Krishikosh repository has no responsibility or liability for these contents. Every effort is made to keep this repository up and access smoothly to the end users.

## 4. NATIONAL DIGITAL LIBRARY (ndl) OF INDIA

<https://ndl.iitkgp.ac.in/>:-MHRD under in National Mission on Education through Information and Communication Technology (NMEICT) initiated this project. It is a digital repository of vast amount of quality academic content and provides framework for virtual repository of leading resources. It provides interface support for leading Indian languages for all academic levels including researchers and life-long learners. Recently MHRD through NDL developed and executed by IIT Kharagpur, has created special collection called “ **Corona Outbreak: -Study From Home**” which is equipped with quality academic and research materials to ensure distance and lifelong learning to the students and teachers during this pandemic situation. In addition to this, MHRD and IIT Kharagpur have also released first of its kind **Consolidated Covid -19**



**Research Repository** which can be accessed through NDL India platform. It is pooled with latest Scholarly content and also enables people to contribute their works to this repository.

#### **5. NATIONAL REPOSITORY OF OPEN EDUCATIONAL RESOURCES (NROER)**

<http://nroer.gov.in/>:-NROER is a collaborative platform, which brings together everyone interested in school and teacher education. Initiated by the Department of School Education and Literacy, Ministry of Human Resource Development, Government of India and managed by the Central Institute of Educational Technology, National Council of Educational Research and Training, the Repository runs on the Meta Studio platform, an initiative of the Knowledge lab, Homi Bhabha Centre for Science Education. A portal equipped with best quality informational content on diverse topics in multiple languages a total of 14527 files including 401 collections, 2779 documents, 1345 interactive, 1664 audios, 2586 images and 6153 videos on different languages

**6. e -Books:-**e-books are one of the important e -resource playing a key role for agriculture education, extension and research. In this pandemic situation all Agriculture Universities are requested to publishers for providing the remote access facility for the benefit of students and faculties. In this pandemic situation the use of e -books and online resources was increasing tremendously. As per usage statistics of all e-resources, it had shown the value of online learning and teaching as well. MPKV, Rahuri has below motioned e-books of various publishers –

1. [Astral ebooks](#)
2. [Cabi ebooks](#)
3. [Arts and Science Publisher](#)
4. [Taylor & Francis e-books](#)
5. [NIPA e - books](#)

#### **7. Online Test Series:**

<https://www.nipaers.com/signup>

JRF / SRF are one of the major criteria for accreditation in Agriculture Universities. We had subscribed this database for online test series of students. In this pandemic situation this said database used widely for access the discipline wise questions. The database contain more than 2 Laks online question on various agriculture subjects. It's also offers mock test facility to the students managing time as well national scenario.

#### **8. Shodhaganga <http://shodhganga.inflibnet.ac.in/>**

Shodhaganga is a digital repository of Indian Electronic Thesis and Dissertations (ETD) hosted, maintained and made available by the INFLIBNET to all the research community in open access. As on date 276171 full text theses, 7650 Synopsis/MRPs/PDFs/Fellowships are available with the contribution of 451 Universities in diverse discipline. The lockdown period has seen a huge upsurge in digital learning. The access to the above digital resources has grown nearly five times. In addition to these, many institutions are holding online classes through various platforms like Google classrooms, Zoom, Webex, etc.

**9. Library Training & Orientation** -For better use of electronic resources, user should know to access the same using online platform or tools. To get all e -resources at one location, university library MPKV Rahuri developed online public access catalogue (OPAC)

<http://mpkvlibrary.firstray.in/in> this pandemic situation we have organized three online training programme for students and faculties. With the help of this students can easily avail the online resources.

**10. Document Delivery Services (DDS)** - In Indian education system, students and faculty members are preferred print resources as compare to other media. To fulfil the demand, we have



started Document Delivery Services (DDS). Through this service we have send Articles, Some part of thesis, Agricultural Statistical Data, book chapters etc... This will help the user to meet their education literature demand.

**Conclusion:-**The outbreak of the COVID -19 pandemic has necessitated sudden and radical changes in delivery of library services, as strict social distancing and lockdown measures were imposed in the early phases of the pandemic. The Internet and web technologies have created a new and unparallel environment and enabling the libraries to enhance and strengthen the research, teaching and learning even in this difficult and uncertain time. The concept and practice of providing remote access of e resources by libraries is not new, but the user friendly way adopted by many libraries and the number of resources made available by them during the pandemic is exemplary. Considerable planning by the library professionals will be required even after the open of educational campuses. It will be imperative to re-assess every existing service and re-design it in view of the government protocols to deal with the situation. Following strict social distancing measures visit to library could be restricted when institutes re-open. Users may demand for additional digital resources if the situation does not improve much for a longer period of time. The points discussed in this article are aimed in providing evidence which can be the basis for sound decision making while selecting any new features or refining the existing features in the services to be planned even after post COVID – 19 which will at least reduce the gap that students are likely to experience if restriction to visit the physical facilities of the libraries will continue even after re-opening of the institutions. While many academic libraries in India are still struggling to build a strong e-platform to render their services, adoption of tech-led holistic approach is the only way out which can help tide over the challenge and keep the libraries functioning without a halt. Libraries have acted smart even this time and evolved as a continuous learning factory. It can be said from this study that libraries are emerging as new genre of knowledge hubs capable of playing a vital role in supporting our nation to settle into a new normal situation. Post Covid -19 pandemic the educational society will be transformed in a manner which was never thought off. Means and modes of dissemination of information and imparting the education among the students will be a hybrid one from now onwards. Digital divide, poor IT infrastructures, financial resources etc. are the challenges to be addressed by the HEIs and Governments. They must create coordination mechanisms that allow joint progress to be made in generating greater resilience in the higher education sector in the face of future crises, whatever their nature may be. Changes in the mindsets of Educationalists, policy making authorities are the dire need of the hour.

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## **A Study on the impact on the physical activities of the secondary School students due to the closure of schools in connection with the on-going Covid - 19 pandemic**

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**Abstract:-**Due to the COVID -19 all the schools are closed down and all the physical activities conducted for the students are cancelled. This study observed the impact on the physical activities of the secondary students due to the Covid -19 pandemic. The dissolution of physical activities for the secondary students around the state may lead to the difficult times to the students to achieve the recommended levels of physical activity among them. A survey was conducted for the assessment of the secondary students for the physical activities during this on - going pandemic covid- 19.

The Temporary changes in Physical activity and inactive behaviour in the students due to on - going COVID-19 may become forever rooted, leading to amplified risk of obesity, diabetes, and cardiovascular disease in the students. Some courses and plans should be geared towards promoting physical activity and reducing inactive behaviour among the secondary school students.

The most of the schools have made physical education an essential part of their education program because they know that physical education plays a key role in the growth of a student's life. The students who participate in physical activities are always happier and healthier than those students that spend all their time studying. It has been known physical activities help in providing more oxygen to the heart and brain and allows the body to maintain equilibrium between physical and mental health.

The Schools must reflect numerous issues in the development of physical activities and one of those is the age of the student. Schools need to have age -appropriate physical education classes for students. The significance of physical education and have a well fusion of academic, non - academic, and physical education activities for the holistic growth of the Students.

**Key Words:** Covid, Physical Activities, Education, Behaviour, Health

**Introduction:-**It is essential to note that physical activities and exercises not only maintain physical and psychosomatic health but also help our body to respond to the negative consequences of several illnesses like diabetes, hypertension, respiration diseases and heart diseases. The consistent exercise strength significantly decreases the risk of acute respiratory distress disease, which is one of the foremost roots of death in COVID -19 patients. Exercise and physical activities have important functions for individuals' mental well -being. When health promotion activities such as sports and regular gym exercises are not available in a pandemic situation like this (thankfully they are gradually opening them up now), it is difficult for individuals to meet the general WHO guidelines. The new WHO 2020 Rules strain that any

quantity of physical activity is better than none. Promoting satisfactory level of physical activities in students is a must. The Study have exposed that compulsory sitting behaviour has led to grim moods and low attitudes in healthy students. The physical education is an essential part of the total education process and aims at the enlargement of physically; mentally, socially, and emotionally fit citizens, through the medium of physical activities.

**Benefits of Physical Education :-**The number of non-educational events that children do in India has increased over the last few years. The informal obtain ability of non -academic activities, children are spending less time keeping themselves healthy. The rise of Smart mobiles, TV, and computers the children are no longer keen on health.

Physical education supports in developing students' skill and confidence. It helps them to take part in an inclusive variety of physical activities that are crucial to their lives both in and out of school. A high-quality physical education platform allows all students to enjoy and do well in many types of physical activities. The importance of physical education programs is to benefit students to develop a wide range of talents and capacity to use tactics, strategies, and original ideas to execute successfully at home and school. The following are the benefits of physical education:

**Teaches Moral Characters :-**The first benefit of physical education is that it teaches moral characters that students need to succeed in this competitive world. The main morals that they learn from physical education are resolution and work morals. In physical education or sports, differences often arise and only morals and persistence from the players can reduce the differences.

**Physical Fitness :-**Physical fitness is the key constituent for a healthy lifestyle. The physical education is an essential component in schools. When students have regular fitness activities as part of their everyday routine, they stay fit and healthy. Regular physical activities help in better absorption of nutrients in the body and also help in improving cardiovascular health and developing muscular strength.

**Improvement in Academic Performance:-**The Most important advantage of physical education is that it helps in improving the academic performance of the students. The maximum physical activities that students perform in schools are related to higher levels of concentration which in turn assistance with better behaviours. Physical activities and sports activities help in enhancing the knowledge learned in the classroom.

**Social Interaction :-**Apart from the classroom, physical education is the only period when students can meet and interact with their classmates and other schoolmates. It helps to improve their social behaviour. During the physical education period, they learn to cooperate through various group activities and get an intellect of identity from each other. These social activities continue to play a significant role in the growth of a student into a better professional. The sport is one of the best sources to develop leadership and management skills in students.

**Reduces Stress :-**There is massive academic pressure on the students. Many schools give significance to main subjects and students are under pressure to make better in these subjects. Even after spending several hours in the school, they have to work on homework at home and this leaves them with little time to do physical activities. And because children spend a lot of hours on academics, this leads to a lot of mental and physical pressure on the students. Physical activity can help to take away stress and anxiety.

**Breaks Monotony, Helps to Focus :-** The break affects our work and we lose focus. The students too are liable to this tedium. The students need more than one break in a day if they are completely academically -focused. Because of this physical education comes into the picture. When students get involved with physical activity in the school, they can break the tedium and burn up the extra energy that is affecting tedium, leading them to performance in the classroom and not able to pay attention in the classroom.

**Learn the Importance of Staying Healthy :-** The students learn by watching our actions and behaviours. They need someone that can act as a role model and help them to start training to stay fit. Physical education is one of the best ways to impart them the basics of exercise. The physical education presents students to exercises and when they like that, they will continue to do it for the rest of their life period. Physical education is to learn different types of physical activities that student can enjoy.

**Nutrition:-** The main element of physical education is nutrition. The students learn about the important of nutrition and key nutritional guidelines in physical education periods.

**Learn Positive Behaviours :-** The classroom education and physical education keep them engaged and preclude them from going astray. When students are involved with physical activities, they get to work as a team and also learn to value education.

It is clear that physical education plays an important role in the development of a student life. There are numerous aspects that should be considered in the growth of sports activities. The age of the student is one the aspect. It is energetic for a physical education teacher to help the students to make the right choice of physical activities for their life period. There are several good reasons for why physical education should be incorporated into the school's curriculum.

**II. Methodology :-** The data is composed through scientifically planned exposed ended questionnaire. The total 80 students are selected across the Goa State. The questionnaires were distributed among the students to get the right and reliable figures which will improve the worth of research. The Directorate of Sports and Youth Affairs, Government of Goa is a top body for sports which was set up on 1st July, 1973 by the then Chief Minister of Goa, Daman & Diu, Shri Dayanand B. Bandodkar for stimulating physical education in the then Union Territory of Goa, Daman & Diu. History of Goa reproduces that sports existed since ancient times and games were played for renovation and desire. Traditional Goan games over the years like Kho-Kho, logorio, card games asket and basket, Langddi, etc are not common today and the children and youth have lost interest in them. Goa being the colony of Portuguese for 400 years have inborn the identical taste towards football. Though India is a cricket crazy country. The Government of Goa not only supports football sport but offers infrastructure and other amenities to inspire people to play various other sports for pleasure or for physical exercise or as professional sports.

### III. Objectives of the Study

1. To examine the impact on the physical activities among students.
2. To investigate the role of the physical education teacher for the physical activities during the Covid-19 pandemic.

### IV. Findings and Conclusions:

1. It is observed that around 80 percent students are become inactive, and are not doing any physical activities. This may be due to the change in the behaviour among the students because of the covid -19 pandemic. The most of the time is spent by the students on their smart phone for video gaming, social media and personal communication. It is being suggested that the students should limit the amount of time spent for social media and video gaming.
2. It is revealed for this study that the sleeping hours of the secondary school students have increased. More than 85 percent students sleep for more than 11 hours per day. This sleep pattern was disturbed due to the closure of educational institute for the students. During this virtual meeting time, some students are seen attending their classes by sleeping on their beds. After the virtual meeting students again take a nap. This may lead to the psychological and physical problems among the students. The Physical education teachers keep on instructing or motivating the students to have the normal physical activities. They also give lectures or send some videos to motivate the students for physical activities.
3. The study pointed out that due to intensive use of smart phone by the students, there is a strong effect on their eyes. This shows that the more use of the smart phone by the students indirectly affect their health. That means that the traditional methods of teaching and learning are more safe and lively.
4. It is also clear that some students do not attend online classes on account of having poor internet connection. However, at times it is found that such stories are just made up. The students are busy in the other activities such as sleeping, playing games, moving with their friends for fun, or certain other activities, wherein some parents might be totally ignorant about it.
5. During this covid -19 too, the physical education teachers want to carry out all the physical activities and competition at taluka, district and state levels, but due to the restriction from some parents, it is not possible to have such competitions. This results into the decrease in the activity among the secondary school students. If such competitions are held then the students will be busy with practices, and automatically there will be a change in the behaviour and attitude among the secondary school students.
6. The physical education is a dominant means to nurture physical fitness, mental well-being, as well as social attitudes and behaviour while populations are locked down. International rights and values based physical education instruments and tools, such as the International Charter of Physical Education, Physical Activity and Sport, the Quality Physical Education Policy package and the Values Education through Sport toolkit remain highly relevant references to ensure that the many online physical activity units that are being currently arranged conform with gender equivalence, non-discrimination, security and quality criteria.
7. Low-tech and no-tech solutions must be sought for those who currently lack access to the internet or time. Making a flexible but steady daily routine including physical exercise every day to help with tension and anxiety is advisable.
8. The Government of Goa has taken all the steps to provide training and resources to support teachers in adapting to this new learning environment during this pandemic covid -19 periods. The teachers certainly are facing the extra pressure which is being put on them to deliver learning in a time of crisis. It is providing support for teachers' own psychosocial well-being too, which is an essential component of supporting students.



9. The online platforms prepared by physical education teachers should reproduce a value-oriented approach that includes behaviours such as communication, teaming, socialization, difficult answering and collaboration. All students in a class are not at the same level of ability. Teachers should cultivate online platforms that will empower students to grow their basic skills at their own level. In addition, they can prepare a health and wellness-based model that incorporates World Health Organization (WHO) guidelines. The association amongst student and teacher is very significant to safeguard that learning takes place. This is a new challenge in teaching physical education, and physical education teachers will be a resource educator and coach to all students during the COVID-19 pandemic. Physical education teachers' should Guide the students in the process of becoming physically energetic and fit for an era.

#### **V. Limitations of the Study:**

- i. Since the study is piloted using small groups of the student-community, their estimations on the impact on the physical activities of the secondary School students should not be generalised.
- ii. The data is composed from the students of the Goa State.

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## MOVING BEYOND CONVENTIONAL MANAGEMENT STRATEGIES TO MORE SPECIFIC REHABILITATION IN PATELLOFEMORAL PAIN

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**Abstract:-** Patello Femoral Pain (PFP) by its nature is a condition very difficult to diagnose and treat. Traditionally it is been overlooked and presently require close scrutinization. Current following assessment methods, classification and specific interventions need to be modified as per the recent evidences. This article put forward a new clinical categorization model in reference to the movement impairments other than the traditionally considered patho-anatomical model develops through different evidence-based management strategies for achieving maximum recovery and prevention of recurrence.

**Key words:-** PFP- Patello Femoral Pain, CNS- Central Nervous System, VMO- Vastus Medialis Obliques, VL-Vastus Lateralis, VM-Vastus Medialis, PGM- Posterior Gluteus Medius

**INTRODUCTION:-** Patello femoral pain is one of the most frequently diagnosed knee pathology accounting for 25% - 40%. Typically, it's non-traumatic in origin and results in peri or retro patellar pain and considered as a diagnosis of exclusion. It is interesting that most of the youngsters with Patello Femoral Pain (PFP) do not have any structural. According to Dye et al exercise rehabilitation is the most effective way to manage this clinical enigma. Literatures reviews about various existing management protocols say these are addressing wide variety of pathologies related to knee joints making them confusing and is considered because of lack of knowledge in underline mechanism caused for the clinical presentation, more over it gives a poor long-term effect even.

**Key factors to consider during evaluation of patello femoral pain :-** The diagnosis of PFP should be a subjective one by adopting a well-structured physical examination to find out the underlying maladaptive movements and related dysfunction. Investigations and imaging are primarily focused on the path anatomical lesions and they have very minimal role in identifying and describing the complex nature of this condition. 4<sup>th</sup> multi-disciplinary international PFP research retreats held in Manchester (2016) support this perspective and successfully formulated a diagnostic criterion as follows.

Presence of retro or peri patellar pain and reproduction of this pain during activities can consider as major feature, crepitus and effusion can be kept as additional findings. Among this crepitus remains controversial. The assessment for pain, including location, severity, sensitivity and pattern are important factors that should be carefully understood to identify the specific impairments, associated with the other symptoms.

PFP Type	Predictive cause
During activity	Mechanical reason
After an activity or next day	Inflammation
Decrease after some physical activity	Tendinopathy
Exertion after any physical activities	Muscular pathology
During even surface walking	Fat pad irritation
Sudden collapse during descending stairs	Chondro flap / osteochondral defect/ bone marrow edema

### Categorization of PFP on the basis of movement impairments

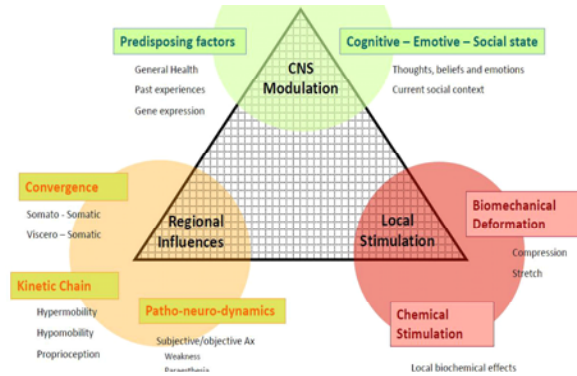
CATEGORY	MOVEMENT IMPAIRMENTS
Category – 1	Overuse or overload without any other identifiable specific impairment.
Category – 2	Muscle performance deficits.



Category – 3	Co-ordination deficits
Category – 4	Hypo as well as hyper mobile structures

### Pain and movement reasoning model for PFP

The recent pain and movement reasoning model proposed globally for all musculoskeletal dysfunctions can be logically attempted here for patellofemoral pain. Thus, we may be able to differentiate the causative factors into local stimulants, regional influences and CNS modulations as given below.



The key factor in holistically understanding and managing PFP is to develop a conceptual basis around abnormal joint loading which is considered to be the principle cause behind. Consistent overloading can pressurize the underlying soft tissues leading to inflammation, sensitization and pain. There are many supportive documents for the same and enlisted bellow. It may be an ice breaking of traditional concepts related to PFP

- Cartilage derangement or cartilage softening are frequently associated with PFP (Fithian DC et al. 2021)
- Foot pathologies and patho mechanics of tibia may lead to PFP (Strong evidences are still lacking, but these factors can disturb the kinetic chain)
- Positive correlation between weight gain and PFP (Lands Meer et.al in 2018), same time contradiction by Bradley S, Neal et.al states that age, height, weight, BMI, body fat and Q angle were not a risk factor for PFP
- No relationship existing between patella femoral crepitus and physical activity (Oliveria Silva et.al, and Pazzinato et al)
- Quadriceps weakness along with psychosocial factors such as fear, avoidance, belief, pain catastrophizing and kinesiophobia can result PFP (Meineke Lankhort et.al)
- PFP is often lead to patellofemoral osteoarthritis (Hinman et al), but insufficient long term prospective data to predict the existence.

### All-inclusive approaches in managing PFP

Patient education remains one of the most effective strategies and it gives a very clear idea about what's wrong with them and how it can be corrected. Clinicians should provide specific education tips on load management, body weight maintenance at different stages of treatment by using terminologies like excessive stress, pressure, overload etc. rather than terms such as “*chondromalacia patellae*”, “*wear and tear of cartilage*” that catastrophize the patient symptoms and often lead to fear avoidance and kinesiophobia.

Combined customized exercise interventions make the mainstay of management guidelines proposed for PFP.

- Modification of activities (adjusting load, frequency, mode and volume)
- Pain intensity modulation and desensitization

- Movement control & coordination
- Kinetic chain interactions
- Optimization of muscle synergies
- Load progression and movement integration
- Muscle flexibility, strength and functional endurance
- Functional integration and performance enhancement

At present, there are no sufficient strong evidences available to support the use of manual therapy, electrophysiological agents, dry needling, anti-inflammatory mediators, knee orthoses in the management of PFP. Taping is recommended for initial phase for modulating pain and improving Quadriceps function during the early phase of rehabilitation.

Large number of literatures are available on the effectiveness of VMO activation and retraining among patients with PFP. Unfortunately, this has led many clinicians around the globe to try this strategy randomly among all cases of PFP. VMO inhibition is a consistent finding and needs to be activated during the early phase of rehabilitation. Stokes et.al in 1984 it self -proved that VM got inhibited by the presence of a mere 10ml of fluid while VL require around 40ml of fluid. This information used on pain modulating techniques such as taping and icing in combination with VMO activation. Hilal et.al in 2018 proved the effectiveness of neuromuscular electrical stimulation along with lower limb closed kinetic chain exercises. Recent evidences also show that the muscle fiber angle and insertion ratio are more important for efficient knee function than the amount of force production it capable off. So rather than strengthening we need to focus on vmo activation, its timing, training angle, synergistic activation and integration with other muscles. Excessive PF joint loading during exercises are undesirable and modified according to its quantification. The dosage of exercise should focus on strength as well as endurance factors such as duration of tension, blood flow restriction training, icing before exercises should be considered most appropriate on situation demands. Squats are found to be one of the best closed kinetic chain exercises to optimize hip, knee and ankle coordination and Quadriceps strength. Sumo squats, Wall squat variations, Deep squats, squats with weights etc. can be gradually incorporated. Wall squats with a resistance loop band around the thigh is found to be encouraging the synergistic co-activation of VMO and Posterior gluteus Medius. Lower limb alignment correction, movement control retraining, synergistic optimization, movement dissociation and integration principles should be utilized while retraining the movements and these strategies have proven its immense value in keeping the patella dynamically stable throughout the functional arc of movement. This will in turn ensure optimal patellar compression load and accounted to be helpful in preventing the recurrence. Gluteus Medius and Maximus are some of the other muscles commonly inhibited as the terminal extension of hip and knee are automatically avoided by the patients during common functional movements such as walking. So, these muscles become seriously inefficient and can lead to the development of undesirable compensatory strategies. Gluteus Medius is considered to be the main stabilizer of pelvis during single leg activities as well as loading phase of gait cycle. Inefficient activation of PGM can lead to an uncontrolled adduction of the thigh and result in excessive lateralization of patella. An average of 26% less abductor strength was noted among PFP patients (Ireland et.al, 2003). In situations where the Gluteus Medius is weak, the functional role of frontal plane stability may be compensated by Fascia Lata and this eventually tone up the IT band. This will restrict the tibia from rotating medially and the femur in compensation may take into internal rotation as part of the integrated kinetic chain function. This can end up in spinning the trochlea away from the patella often referred as patella malt racking instead of trochlea spin. The posterior fibers of

Gluteus Medius is oriented more oblique to the neck of femur and these fibers were found to have a primary external rotation function, optimally up to 25 degrees of hip flexion angle (Cown et al). After 25 degrees of flexion, the external rotation function is taken over by the Gluteus maximus. Many functional activities such as sit to stand, stair ascend, return from squat require external rotation of femur and this is more efficiently done by Gluteus maximus muscle. The muscle fiber orientation in various joint angles should be considered while activating and retraining muscles in isolation, for the specific functional requirement to fine tune the optimal mobility and performance. Patients presenting with back pain as well as PFP in combination commonly found to have gluteal weakness (Wilson 2005). This emphasizes the importance of this large muscle group in stabilizing the hip and pelvis during coordinated lower limb movements. It is important to conduct a separate glute assessment in different planes to find out which functional component is the weaker link producing the specific movement dysfunction to optimize the rehabilitation. We may choose specific exercises targeting various movement and functional demands to the particular context. Hip abduction, external rotation in various flexion angles, eccentric resisted hip internal rotation, weight bearing hip abduction, eccentric weight bearing Gluteus Medius etc. are some of the different options from which we may be able to choose.

**CONCLUSION:-**The Traditional diagnostic methods more consistently failed to address the various movement impairments underlying this clinical entity. Over reliance on path anatomic findings restricted the management strategies and have led to overreliance on relatively insignificant pathologic counterparts. We need to incorporate the recent evidences and paradigm shifts to make the management protocols more effective and focused. Every protocol should be customized to individual patients addressing the underlying specific impairments, dysfunctions, and their functional as well as performance demands.

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## A Study To Assess The Knowledge And Awareness on Management of Hypoglycemia Among patient with Diabetes Mellitus

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**Abstract:-** Diabetes mellitus (DM) is a complex multisystemic infection that requires excellent consideration, expands the danger of possibly dangerous intricacies, and forces a high effect on medical care administrations and a weighty financial weight on society. As indicated by evaluations of the worldwide pervasiveness of diabetes for 2000, projections extrapolated for 2030 to every one of the 191 World Health Organization (WHO) part expresses, the commonness of the infection is projected to ascend from 2.8% to 4.4%, the absolute number of individuals with DM from 171 million to 366 million, with an increment in the extent of diabetic individuals >65 years, and the metropolitan populace with DM in emerging nations to two fold. Subsequently, within the sight of these negative viewpoints, systems for working on successful determination and the board of subjects with DM are of most extreme significance. The review finding shows that portion of the examples knew about the hypoglycemia intricacy, many knows the administration of hypoglycemia. Greater parts of the examples were having moderate information about the anticipation of hypoglycemia. The concentrate likewise presumed that there is of schooling program for the administration of hypoglycemia for the avoidance of complexities.

**Keywords:-** Hypoglycemia, patient, Diabetes Mellitus

**Background:-** Diabetes Mellitus is at present the quickest developing weakening infection on the planet. It is assessed that one out of five individual has matured 20 to 79 lives with this sickness, while a comparative, level of the populace is in danger of creating it (IDF, 2007). It was the sixteenth driving reason for worldwide death in two thousand and fourteen. Ongoing investigations of geological and ethnical impacts have shown that individuals of Indian beginning are exceptionally inclined to diabetes. Diabetes is quickly acquiring the situation with likely pestilence in India. The need to foster instructing or wellbeing training practice exercises for diabetic customers and their families related with the avoidance of inconveniences through self-management of the infection, which grants patient to live with it better.

**Objective:** - To Assess the information on diabetic customers in regards to the board of low blood glucose level. Methodology: A Non-Experimental Descriptive Research Approach is utilized. 60 examples were chosen by utilizing Non-Probability Purposive Sampling Technique. Specialist utilized organized poll to evaluate the information. Result: The information poll was partitioned into three regions as low sugar level condition, the executives of low blood glucose level and anticipation of hypoglycemia. The information shows that, in the space of low blood glucose level condition, the greater part of the examples 40 (66.6%) out of 60 examples had the thought regarding the intricacy of low sugar level however just 11 (18.3%) had addressed the inquiry on when they had a scene of low blood glucose level while skipping suppers. In the space of the executives of hypoglycemia, greater part of them 40 (66.6%) had the information about the fast acting type of glucose, while not exactly 50% of them had the thought on self-administration of hypoglycemia. For anticipation of hypoglycemia, the greater part of them 45 (75%) had the information on the kind of activity which is protected and useful for diabetic customers to stay away from hypoglycemia. As to the board of the hypoglycemia, it demonstrates 28(46.6) examples were having insufficient information while 20 (33.3%) examples were having sufficient information and 12(20%) examples were having tolerably

satisfactory information. As to avoidance of the hypoglycemia, the larger part 34( 56.6%) examples were having reasonably satisfactory information, though 16(26.6%) examples were having sufficient information and 10(16.6%) examples having deficient information. Conclusion: The review finding shows that portion of the examples knew about the hypoglycemia intricacy, many knows the administration of hypoglycemia. Greater parts of the examples were having moderate information about the anticipation of hypoglycemia. The concentrate likewise presumed that there is of schooling program for the a dministration of hypoglycemia for the avoidance of complexities.

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## ETHICAL ISSUE FACED BY THE HEALTH CARE WORKER DURING ELDER PATIENT CARE: A NARRATIVE REVIEW

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### ABSTRACT

**Introduction:-** Health care worker are on the front line in encounters with elder patient care. A problem or situation that requires a health care worker to choose between alternatives that must be evaluated as right (ethical) or wrong (unethical). It was not a moral issue, but an ethical issue and required a lot of thought and planning to figure out a solution.

**Need of the study :-** The purpose of this study was to understand the meanings of ethical issue faced by health care worker ascribe to elder patient care through their perceptions and professional experience with older people and to throw light on patient care's significant role in this encounter.

**Aim:-** To identify the ethical issue faced by the health care worker during elder patient care.

**Material and methodology Search strategy methods:-** Pub med Google scholar ,EBSCO host ,MED LINE etc.

**Eligibility criteria:** - Study focusing ethical issue in elder patient care. Health care workers including nurses, clinicians. Published articles in English accent and published from 1998 to 2020.

**Exclusion criteria :** Editorials commentaries and Non English article were excluded . **Type of studies :** Qualitative Phenomenological approach ,Meta –analysis ,Quantitative approach ,survey method .

**Participant:-**Health care worker (nurses, other clinician staff)

**Setting:** - Hospital.

**CONCLUSION:-**The outcomes of this study support the handful of studies published during the elder patient care that have found that the ethical issue. This review revealed to the authors a significant and disappointing lack of research in the field of ethics in the care of older people. This is perhaps a reflection of society's lack of focus on older people to date. It is likely that this will change not only in response to the increasing size of the population of older people, but also as a response to their changing nature as the baby-boomer and following generations grow old. These generations are generally expected to be more demanding and assertive than previous older generations because of their comparative life-styles and wealth.

**Key words:-** ethical issues, health care worker, elder patient, care .

**INTRODUCTION:-**Health care worker are on the front line in encounters with elder patient care. A problem or situation that requires a health care worker to choose between alternatives that must be evaluated as right (ethical) or wrong (unethical). It was not a moral issue, but an ethical issue and required a lot of thought and planning to figure out a solution. The ethical issues that arise for nurses caring for older people. Education and organizational change can combat ageist attitudes. Wider training is required in the care of older people, workplace skills, palliative care and pain management for older people. The demands of a changing global demography will necessitate further research in this field. For more than a decade, ethical challenges in health care organizations have been reported. The older population is increasing as in the rest of the developed countries. During the last twenty years the number of persons aged 80 or older has increased 81% from 263,000 to 476,000. The cost of providing care for this group has posed an economic problem at the local and national levels. As a result new demands

are being placed on those responsible for elder care. The responsibility for elder care is shared between the local municipalities and the county councils. The main responsibility for elder care lies with the local municipalities and when acute care is required the responsibility is shifted to the county councils. Employment of the physicians occurs through the county councils, while the nurses and aides can be employed by either one of the organizations. Older adult health trends is important in order to prepare for future medical and social care needs. Reports of problems in fulfilling basic needs in elder care have been reported due to the overburdened system. One of the problem areas cited concerns nutritional deficiencies. Increased care needs together with declining budgets contribute to ethical challenges in the health care system. Health care workers experience ethical dilemmas when they find it difficult to know what is the right and good thing to do. Ethical dilemmas occur when there are at least two conflicting choices of how to deal with something and neither leads to a positive outcome. A study that involved physicians in ethically difficult situations has shown that they can have doubts as to which actions for the patients are the best ones to take in specific situations. When nurses feel they are not able to fulfill their professional ideals in ethically difficult situations, they sense their moral self-image can be threatened, which causes them distress. These medical and nursing care issues can be understood from an action and relational ethics perspective. The action ethics perspective concerns the question, what a person should or ought to do in ethically difficult situations and why. In this perspective the ethics are often centered on ethically difficult dilemmas and on the making of a decision. A relational ethics perspective refers to the reflection on the challenges encountered in person's relationship with others and on how to fulfil social roles and obligations in a good way, as a human being, a colleague or a high level decision-maker. How a person can best meet the challenges they confront in a situation or a relationship and how they are involved, is the question raised with this perspective. That which makes a person good is not only their traits but also the characteristics of the situation and the relationships in it. It has been emphasized that both perspectives are needed at the same time.

**Need of the study** :-The purpose of this study was to understand the meanings of ethical issues faced by health care workers ascribe to elder patient care through their perceptions and professional experience with older people and to throw light on 'patient care' significant role in this encounter

**Aim** :-To identify the ethical issue faced by the health care worker during elder patient care.

**Material and methodology**

**Search strategy methods**:- Pub med, Google scholar ,EBSCO host ,MED LINE etc.

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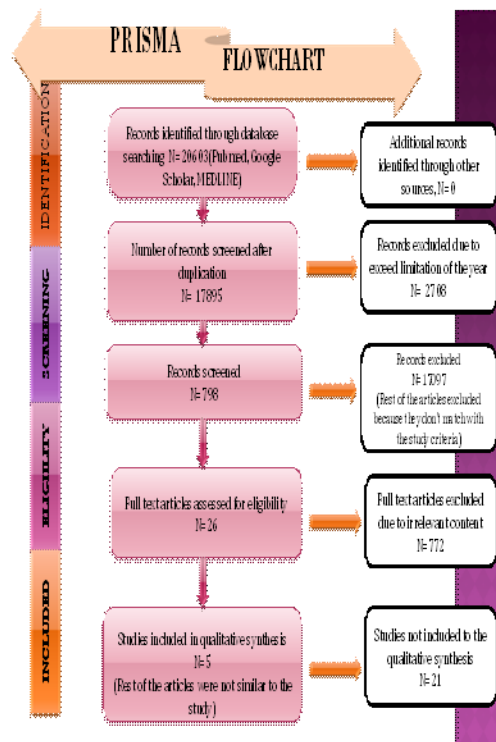
**Exclusion criteria**: Editorials commentaries and Non English article were excluded.

**Type of studies**:- Qualitative Phenomenological approach ,Meta-analysis ,Quantitative approach ,survey method .

**Participant** :- Health care worker (nurses , other clinician staff) .

**Setting**: Hospital.





**RESEARCH FINDINGS:**

AUTHOR'S, YEAR, COUNTRY	STUDY TITLE	STUDY DESIGN	INSTRUMENTS	SAMPLE, SAMPLING TECHNIQUE	KEY FINDINGS
1. Karingnordstrom, tenzim wangmo. 2017 in northwest region of Switzerland	Caring for elder patients: Mutual vulnerabilities in professional ethics	Qualitative Phenomenological approach	semi-structured interview	N=23 nurses Random sampling	Findings shows that Study participants believe that incidences of error, neglect, and abuse are consequences of their own vulnerability since they are not able to meet the demands of an overstraining work situation. Different aspects of this mutual vulnerability are described and critically discussed as challenges for professional ethics.
2. Rita jakobsen, venke sorlie .2010	Dignity of older people in a nursing home: Narratives of care providers	Qualitative Phenomenological hermeneutic approach	Individual interviews	purposive sampling technique	The findings showed that care providers experience ethical challenges in their everyday work. The informants in this study found the balance between the ideal, autonomy and dignity to be a daily problem. They defined the culture they work in as not supportive. They also thought they were not being seen and heard in situations where they disagree with the basic values of the organization. Care settings for elderly people obviously present ethical challenges, particularly in the

					case of those suffering from dementia. The care provider participants in this study expressed frustration and feelings of powerlessness.
3. Jenny rees, lindy king, karly schmitz. 2015	Nurses' perceptions of ethical issues in the care of older people	Meta analysis	online databases: MEDLINE, Cumulative Index of Nursing and Allied Health Literature (CINAHL), Blackwell Synergy, Proquest and EBSCO	Total 11 study with purposive sampling technique.	The findings of this review can be summarized as follows: <ul style="list-style-type: none"> <li>• Nurses experienced multiple sources of ethical issues in the care of older people;</li> <li>• A comparison of nurses' perceptions with older people's and relatives' perceptions revealed that nurses underestimated the size and scope of ethical issues in the care of older people;</li> <li>• Nurses experienced strong personal responses to ethical issues in the care of older people;</li> <li>• Nurses believed that understanding and respecting older people was essential in resolving ethical issues.</li> </ul>
4. S patricia Denes and kay devries in UK 2004.	A survey of ethical issues Experienced by nurses caring for Terminally ill elderly people	Quantitative approach ,survey method .	Questionnaire	N=135 registered nurses working in 13 elderly persons' care units (three community	Nurses working in these settings face a number of ethical dilemmas when caring for elderly terminally ill people and may benefit from more support from outside agencies, including specialist palliative care teams. . As other authors have emphasized, there continues to be a need for education on the principles of palliative care for both doctors and nurses caring for elderly terminally ill patients in these settings.
5. Venke sorlie, ann nordam .et.at 2005 in norway	Ethical challenges in the care of older people and risk of being burned out among male nurses	Qualitative study A phenomenological method	Interview	Sample size - Not specified , purposive sampling technique	the study result show sthat ethical challenges, which lead to emotional and moral strain and a fear of becoming burned out. Conclusions. Continuous stress, little degree of autonomy and high expectations of oneself are causing the male nurses much moral strain. These factors place them at risk of being burned out. The nurses emphasized that burn out can be counteracted by clinical supervision.

**SUMMARY OF FINDINGS:** - Review of all the five articles showed that current research focused on assessing several aspects of ethical issue faced by the health care worker during elder patient care. Therefore, health care workers during elder patient care had experience ethical **STRENGTH & WEAKNESS OF THE STUDY REVIEW** : Article search was carried out on a significant problem and Review could find out various ethical issue of health care worker. Only five articles were included for data synthesis due to challenges in their everyday work. The study found the balance between the ideal, autonomy and dignity to be a daily problem. They defined the culture they work in as not supportive.

They also thought they were not being seen and heard in situations where they disagree with the basic values of the organization limitation. Articles are mainly confined to English accent.

**RECOMMENDATIONS:-**Health care worker may need to do more to raise their profile as patient advocates, particularly when caring for such vulnerable groups. Health care worker working in these settings face a number of ethical dilemmas when caring for elderly people and may benefit from more support from outside agencies, including specialist teams. Health care worker experienced strong personal responses to ethical issues in the care of older people.

**CONCLUSION :-**The outcomes of this study support the handful of studies published during the elder patient care that have found that the ethical issue This review revealed to the authors a significant and disappointing lack of research in the field of ethics in the care of older people. This is perhaps a reflection of society's lack of focus on older people to date. It is likely that this will change not only in response to the increasing size of the population of older people, but also as a response to their changing nature as the baby-boomer and following generations grow old. These generations are generally expected to be more demanding and assertive than previous older generations because of their comparative life-styles and wealth.

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- ⑤ Nurses' perceptions of ethical issues in the care of older peoplejenny rees<sup>1</sup>, lindy king, karl schmitzaffiliations expand pmid: 19528101 doi: [10.1177/0969733009104608](https://doi.Org/10.1177/0969733009104608)

## THALASSEMIA ISSUES AMID COVID-19

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**Abstract:**-Covid 19, one of the viral diseases which wallops the whole world. It is a very minute virus, but destroys everybody's lifestyle. It causes tremendous pressure on normal lives. Where normal people suffer, what about those genetic disease patients? Especially Thalassemia, who require blood every 2 to 3 weeks for their endurance. These sufferers have to visit health clinics frequently for their regular blood transfusions, health checkups, investigations, follow-ups, medications, and complications issues. Thalassemia is an inherent hemolytic disease. It passes from the parents to the next generation. Due to defective genes, these children have less capacity for hemoglobin production. Therefore, for survival, there is a demand for them for administering blood on the regular schedule. There are several sorts of this disease which classify as per the severity of it such as Thalassemia major, Thalassemia intermedia, and Thalassemia minor or trait. The Thalassemia major and Intermedia both have to be managed by blood transfusion and iron chelation therapy. Henceforth it creates a great burden on the health professionals as well as the sufferers and their families. The third form of the disease does not have any clinical manifestations and these clients are normal as like others but they still can have transmitted the disease. These individuals are known as carriers. On average annually 10-15k Indian kids have been born with Thalassemia Major and needed frequent blood transfusions for their existence. BMT (Bone Marrow Transplant) is only the curable treatment for this disease but everyone is not getting it due to financial disputes, BMT centers shortage or inaccessible matching HLA donors. Thus these children ought to be managed by providing regular blood and iron chelating drugs. This should be for life long. The government and non-government organizations have to work efficiently for these children. They arranged the screening program for regular check-ups, blood donation camps, awareness programs for the betterment of thalassemia. The government has included this disease in disability benefits. They are issuing disability certificates to these people for better education and employment opportunities for these children. Even the health facilities available for them are free of cost. The thalassemia client gets preference for receiving the blood in any blood banks everywhere in India. They have their registration cards as their identity. With the help of that, they get concession amid transportation also.

**Keywords:-** Thalassemia, Covid-19

**Introduction:-**South Asia is the hotspot of Beta -Thalassemia. Around 2 lakh sufferers live and require regular blood transfusions for their existence. Due to the pandemic Covid -19, numerous nations have received phenomenal lockdown to play down the spread of transmission. Limitation of across the nation human portability and fear of Covid -19 contamination has put these sufferers in a life-threatening circumstance since of an intense deficiency of blood supply. As an open wellbeing readiness technique amid an emergency like Covid -19 widespread, the predicaments of thalassemia clients ought to be considered. The blood banks in the community that are Government-sponsored must be organized or scope extended as a security net for the thalassemia sufferers in lower and middle-income nations.

In India, the prime minister had declared lockdown from 23/3/2020. Due to that, the transportation facilities had stuck. Most of the local practitioners had closed their doors. Each one had to follow social distancing protocols. Nobody could form any groups. Contacts should be online. In these situations, the health professionals have to face a lot of challenges while providing care to the Thalassemia clients, who have to be motivated, encouraged to improve their lives, and reduce the pressure which they carry in day-to-day situations. However, due to this coronavirus, pandemic malady, these children have to face tremendous challenges. The shortage of blood in blood banks is the greatest kick for the suffering. It may be occurred because of fewer blood donors in this lockdown condition. As it is a viral disease, spreading through naso-chromial infections and no as such proper treatment for this viral infection, each one has frightened to getting an infection. Thus, the willingness for donating blood has declined. The News18 (2021) has posted the news on world thalassemia day 2021 that the Covid-19 and the importance of donating blood. It emphasized that the COVID-19 pandemic has made it difficult for thalassemia sufferers to get their blood transfusions due to the insufficient quantity of blood at hospitals. The reasons behind it are first of all the lockdown which affects the blood donation process. Restricted transportation hampered the people wish to reach for blood donations. Community fear regarding getting exposed to the virus is a major cause. Mode of transmission of coronavirus is through the naso-oral route and not via blood transfusion but according to the NBTC guidelines the individual cannot donate blood immediately after the vaccination. Even though the individual has a desire to donate blood then also has to wait for 28 days after the vaccination. This is one of the causes of declination for the blood shortage. Moreover, this pandemic also affected the production and supply of iron-chelating drugs. Iron-chelating medicines are needed for Thalassemic sufferers to get rid of iron deposition which occurs because of blood transfusions. Extra iron gets deposited in the body which has to be decreased in time.

TIF (Thalassemia International Federation) has emphasized that the Thalassemia patients ought to be considered as a vulnerable group in this pandemic and has to be vaccinated as per the priority.

Similarly, The Indian Express newspaper has published a news on May 2020, 'Amid COVID-19, thalassemia patients face challenges with blood transfusion', in that Joint secretary of the Health Ministry, Lav Agarwal had earlier announced that all hospitals were to continue blood transfusion. Then also some thalassemia patients have allegedly been unable to avail of blood transfusion at Lucknow's Sanjay Gandhi Postgraduate Institute of Medical Sciences (SGPGI), a center that has patients not only from the state but from across India. Some thalassemia sufferers had posted notable news about the denial of the transfusion due to the coronavirus pandemic. Anjie on April 2020 tweeted that around 300-500 children require frequent blood transfusions every 15 days and the SGPGI Lucknow has been denied the transfusion service for the reason of corona disease. Further, the client focused on anyway not because of corona but they will die without treatment.

Other sufferer Pooja tweeted that while considering all inside and outside Lucknow there are approximately 20k SGPGI registered thalassemia children. The center is providing services for these patients for since a long time but now it turned into Covid ward. Thus these children had been informed to receive blood transfusions in different centers. Pooja said that SGPGI can provide services to the Covid patients at any place in the Institute itself because it is a big hospital. Then why does only the thalassemia ward want to turn and refusing thalassemia patients. On the other side, Dr. Shubha Phadke, Head of Department at SGPGI described that

these patients are at great risk for getting coronavirus infections. As SGPGI had provided blood transfusions for these sufferers, so for the safety purpose the center has recommended these clients to get services in other small centers which are having fewer crowds. Patients coming to SGPGI will now have to get themselves tested for coronavirus first. The doctor added that the hospital has also been trying to provide blood transfusion outside of its premises, besides catering to those with serious health conditions. She further informed the fear regarding the safety of these sufferers and their caregivers. Even they will be trying to make provision within the campus itself as soon as possible. As the news related to less blood supply has been getting viral from Maharashtra, West Bengal, and Uttar Pradesh. One of the 100 bags capacities of blood bank in Uttar Pradesh now has only 16 bags. Because of the shortage of blood, most of the individuals were unable to get free blood; even most of the routine surgical procedures had been postponed. Therefore, some patients have been informed to arrange the donors on their own. Joint Secretary Dr. Harsh Vardhan, Union Health Minister had given instructions to all the states blood banks should make provisions for adequate blood units' availability. All hospitals should disseminate services for the blood disorder. The National Guidance to Blood Transfusion Services in India in Light of COVID -19 Pandemic, released by NBTC and the Health Ministry, expressed that sharing and exchange of "screened or otherwise low-risk blood and blood components" was a potential arrangement, as per the NBTC rules, when the impact of an infection episode leads to inadequate of blood supply as the request for it proceeds at an ordinary level. To defend supplies and secure beneficiaries from unnecessary exposure to a possibly infectious clinical item only necessary blood components ought to be administered. Emphasizing the requirement for adequate blood supply amid this circumstance, the official report expressed that at present, there is no information or point of reference recommending the chance of transfusion-transmission for COVID -19. The rule also focused that encouraging benefactors to offer assistance whereas keeping up social distancing standards and disease control rules. S. Arshad Ali et al (2020) in their article titled, "The impact of COVID -19 on transfusion -dependent thalassemia patients of Karachi, Pakistan: A single-center experience: A retrospective, cross-sectional study", was conducted in 2019 -2020. This study resulted that amid covid -19 the demand for RBC bags was reduced. The study concluded that this pandemic adversely affected the already suboptimal care catered to thalassemia patients in Karachi, Pakistan. The fear of the virus contraction coupled with the lockdown and restricted mobility has disrupted the entire transfusion chain from donor to recipient. Collaborated efforts by the government and healthcare authorities are essential to ensure sufficient blood for thalassemia patients amid the pandemic. Hossain MS et al (2020) in their article titled, "The forgotten people with thalassemia in the time of Covid-19: South Asian perspective", described the various facts about the thalassemia patients amid Covid-19 such as the crisis of scarcity of blood, especially in South Asian Thalassemia sufferers. The lockdown has affected individuals' lives in phenomenal ways such as the need for open transportation to limit individuals' movement. Such limitations will moreover make it troublesome, or indeed outlandish at times, for both the blood givers and beneficiaries of the thalassemia patients. The authors flaunted the extreme shortcoming within the blood supply chain. A huge challenging job is recruiting voluntary blood donors because of low awareness in the countries.

One of the WHO reports described that in 2016, over 6 lakhs of blood units were collected in Bangladesh and the estimated demand for that was 8 lakhs. Therefore, approximately 70 k – 80 k thalassemic had been unable to get the blood. Voluntary collection of blood is very less and around 70 percent of people have to bring their relatives and friends along with them for their



blood demand. Unfortunately, collected blood gets unable to use because of not only the inadequacies of storage facilities, underutilization but also the limitation of blood itself. Hossain MS et al (2017) in their article, "Thalassemys in South Asia: clinical lessons learnt from Bangladesh", revealed that Bangladesh citizens have specialized thalassemia centers only in Dhaka, which is the capital of Bangladesh. Approximate 70% community residing in the rural side. In addition due to unaffordable conditions, the majority of the thalassemic individuals could not go for the treatment. Moreover, this lockdown condition also hampered the transport facilities and even though who can afford it they have to grapple to get blood due to unavailability of it. According to The Indian Express news (2020), Thalassemia patients had launched complaints against the blood banks for refusing free blood supply. Therefore, the Maharashtra government had been taking an action like inquiry about the matter from the particular blood banks and punished those banks which had refused to supply blood for hematological disorders despite the availability of blood stocks to fine Rs. 1k. Moreover, if particular banks had taken charges for blood units they have to refund back in triple amounts and if found overcharged for service then should be given five times the charge to State Blood Transfusion Council. Maharashtra had organized more than 3k blood donations camps in 2019. Due to lockdown many corporate offices and colleges are unable to avail of the camp therefore in 2020 around 2k blood donations camps have been arranged which lessened the collection of blood units. One of the blood banks said amid Pandemic their stocks had decreased from around 120-150 units to 60-70. Unfortunately, the blood cannot be made available in any laboratory or other sources, only human beings can make it available by donating blood. This pandemic adversely influences the voluntary desires of blood donations. However, the regional blood council in-charge Dr. Thorat has instructed the blood banks and the camp organizations to access residential societies and encourage them to voluntarily blood donations and also ensure their hygiene and safety about this pandemic situation. Dr. Pagare, Sir J. J. Group of Hospital blood bank also appeals to the community to voluntarily come ahead and donate blood on a humanity basis as severe scarcity of blood and urgent requirements of blood. Whereas, Telangana thalassemia sufferers have also faced the same problem. The Tallam Express News Service has published news written by Naveen Kumar that amid covid-19 volunteers donors were not available hence there was a shortage of blood supply and the available blood stocks were also being utilized for the routine patients. Therefore, there was a very terrific situation occurred for thalassemia patients. To overcome the situation and make awareness to the society, Mr. Reddy, District Secretary of Indian Red Cross Society (IRCS) has insisted his sons donate blood and the blood has been collected for these sufferers. The IRCS team has requested the community to donate blood and save thalassemia patients' lives. Amidst Covid-19 the team found it difficult to encourage the people to donate blood.

Similarly, Geetika Mantri has posted the news in 2020, "Bengaluru's thalassemia patients struggle with blood, medicine shortage amid lockdown", described that due to shortage of blood self-blood donors have been arranged by thalassemia patients. Very few people can do this, rest are unable to have their donors too.

Bengaluru Rotary TTK Blood Bank in charge, Dr. Swamy informed that earlier blood units collection was approximately 3k in a month from 27 storage centers which had minimized due to this coronavirus around 500-600 only. Because of this scarcity, they were unable to provide blood supply to the government which was earlier they did. Previously this team had not refused any clients amid covid-19 and shortage of blood stocks they demand replacement donors from the Thalassemic individuals. Many children have called the Thalassemia and Sickle Cell Society



president to not receive the blood for transfusions. As there was less collection due to lockdown and coronavirus situations and available blood has been provided to the surgical cases, thus the thalassemia patients have difficult situations.

Additionally, life-saving medication unavailability was another issue for these sufferers, these medications are available in particular pharmacies only. Amid of lockdown which was not available, because the police have taken action and shut down the shops as well forcing people to remain home so the dealers are unable to provide the medicine. These are a very expensive drug that's why everyone should not stock them.

Henceforth, the president had sent an e-mail to the Health Minister of Karnataka highlighting these problems. An email was sent to the Commissioner of Police as well, requesting police faculty to not halt the benefactors from traveling to blood banks and permitting retail outlets like Novartis and Cipla to stay open. Be that as it may, they have not gotten a response so far.

In their capacity, the blood banks have begun issuing letters that can be sent to blood givers and thalassemia clients clarifying why they have to be wonder out and come to the blood bank. In any case, the fear of being halted and addressed may still stop numerous from coming to give blood, thalassemia sufferers say.

Ranjit et al (2021), in their article titled, "Blood scarcity at the blood banks during COVID -19 pandemic and strategies to promote blood donations: current knowledge and futuristic vision" revealed that studies have shown that the SARS-CoV-2 disease does not transmit through blood, or may be person-to-person transmission ideally occurs through respiratory tracts amid near contact with a symptomatic client (droplets generated amid sneezing, coughing) and airborne amid coordinate virus exposure. Blood donation campaigns can be proceeded during the widespread as each drop of blood counts for those who are in need.

#### **Role of Nurses amid Covid-19 for the betterment of Thalassemia**

1. Provide masks to each thalassemia patient and their relatives while coming for blood transfusions. Explain the importance of social distancing, wearing masks, using sanitizers, and basic respiratory hygiene. Keep close observation to follow these protocols by these people.
2. Make awareness to the people about the mode of transmission of coronavirus by proper health education.
3. Make provision for online contacts of these clients to avoid the unnecessary crowd. Ensure online contacts such as WhatsApp, Email, Video conferencing, etc.
4. Encourage the community to donate blood to help thalassemia sufferers. As it is a need of the hour, every individual should participate in blood donation camps as per their eligibility.
5. Collaborative work with the blood banks to arrange timely blood supply for these clients.
6. Emphasize aseptic precautions while providing care and provide comprehensive care to each individual.
7. Listen attentively to their queries and doubts. Try to solve that with proper ways of communication. Communicate the issues of the clients with high authorities and make provisions to resolve the issues.
8. Provide psychological support to the clients and their families related to the disease, its complications, and the treatment modalities.
9. Promote the health of these clients by providing proper care.
10. Keep records and reports of the blood transfusions and related events in the centers.

#### **Conclusion**

Thalassemia is an inherited disease that requires lifelong blood transfusion and iron chelation medications for the client's survival. Amid covid-19 the scarcity of blood and unavailability of

medications are the big issues. These sufferers are facing tremendous problems due to lockdown such as no blood units in blood banks, economic disputes to get transfusions, donor replacements issues, restrictions in transportations, etc. creates lots of pressure on not only the patients and their families but health professionals also. The Health ministry and Thalassemia societies are trying their best to help these sufferers. All districts government and non-government organizations in India organize blood donation camps to overcome the shortage of blood in their respective cities. The nurses are the big link between the patients and the medical professions, thus they have to play a major role during this situation. They can disseminate health education to the clients as well as the community to help these people.

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**Assessment of Patho-physiology of COVID Induced New Diabetics on Therapeutic Dietary intervention to Estimate the Potential of laddu Prepared by functional Food Ingredient's Mix on Improvement Status of post COVID DM**

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**Abstract:-** The level of morbidity due to highly potential post COVID complications are increases at enormous, and pose significant healthcare burdens on both families and society. The new onset diabetes mellitus (DM) is one of them, the post COVID health problems. The effect is now highly visible across all sections of society within India and degraded the quality of life of citizens ; there is now the demand for urgent researches and intervention - at regional and national levels - to try to mitigate the potential ly increase the cases of new onset diabetes as the post COVID consequence and control the hospital returns of the patients. The reveals of researches will be then helpful to formulate the suitable controlling approach and overcome the fatal complications associates with post COVID consequences. The nutritional therapeutic is one of the major segment regarding this aspect, necessary to control the diabetes problem and maintain the normal health of post COVID people. The dietary intervention were made with medication on post COVID diabetics of study group whereas same patients of control group did not provide the dietary package with medication. It observed that the significant differences on blood glucose levels of two groups were found at 0.05 level on p value.

**Key words:-** Pandemic, post COVID, new onset diabetes, dietary intervention, consequences.

**Introduction:-** Dr Rahul Baxi (2021), stated on the basis of observations of empirical study (with a group of diabetesiologist, Mumbai) reveals the worry is that Covid-19 could trigger a tsunami of diabetes in India after the pandemic over," He said 8 -10% of his patients with no history of diabetes who contracted Covid-19 continued to have high sugar levels months after recovery and were on medication . Investigations using human clinical studies are needed to confirm the beneficial effects of different therapeutic treatments for this diabetic.

India faces several challenges in pandemic management and has taken drastic and urgent steps to develop an in tegrated national health system for early detection and prevention of this disease. National capacity for management of the disease has to be enhanced by training large number of medical, nutritional and paramedical personnel and by creating a network of g overnmental and nongovernmental units working towards the goal of better management of diseases. But the post-COVID consequences leads many diseases such as steroids induced diabetes, cardio -pulmonary, ostioarthopathy, insomnia, mental disorders such as depression, stress anxiety etc.

Dr Anoop Misra, a dialectologist and co -author of the study (2021), says the emerging evidence about the link between Covid -19 and diabetes presents a "complex" picture. The therapeutic policies of any nation have been aime d at improving and controlling the status of disease of all

citizens with providing them suitable treatment and empowered them for productivity even in this pandemic condition. Under dietetics therapeutic stream the determined Functional foods will helpful to overcome the problems of uncontrolled complications as retinopathy, chronic renal failure etc. The basic aim of this attempt is to recognize or identified the efficacy of the functional foods to controlling the disease on diabetic patients.

According to **S. Shah, (2021)** , post covid patients are still on medication to control his blood sugar. There are a lot of people taking medicines (nearly a year after recovery), for diabetes after recovering from Covid-19,"to control it. Steroids reduces inflammation in the lungs for Covid-19 and appear to help stop some of the damage that can happen when the body's immune system goes into overdrive to fight off the virus. But they also reduce immunity and push up blood sugar levels in both diabetic and non -diabetic Covid-19 patients. **WHO, (2019)**, India accounts for one in six people in the world with diabetes. Home to an estimated 77 million diabetics, it is second only to China, which has 116 million people living with the disease. Apart from that millions more remain s undiagnosed for this chronic and progressive disease which occurs when the pancreas doesn't produce enough insulin or the body is unable to effectively use the insulin it produces. This leads to increased concentration of glucose - a type of sugar - in the blood and poses serious health risks, including damage to the kidneys, eyes and heart. Diabetes is among a group of underlying conditions which put people at increased risk of severe Covid -19 disease. The others are obesity, high blood pressure, and heart and lung diseases. Now physicians fear a large number of patients who have recovered from Covid -19 are at risk of newly diagnosed, full-blown diabetes. With nearly 32 million recorded infections, India has the second -largest Covid-19 caseload in the world, behind the US.

Objectives of study: to understand the etiology or role played by Covid in precipitating diabetes as post covid consequence ; To follow up the biochemical assessment in constant monitoring the diabetes status and assess the patho-physiology of respondent patients on dietary supplementation with medication in controlling diabetes gradually.

The research questions: Will the people with new onset of diabetes after Covid -19 become lifelong diabetics or can be resolved on the line of gestational Diabetes? Is the longitudinal biochemical and patho-physiological profiles of covid induced diabetics can be indicate that its a permanent disease or a temporary metabolic alteration which could be resolved? Is any dietary role there to resolve this new onset diabetes?

As its a new area where onset of high potential diabetes has been seen. Before that the infections like mumps and measles are known to trigger point for diabetes due to the stress on the body. But now its about Covid-19, may indirectly or directly affects pancreas, leading to diabetes. The study will identify the causes associated with onset of diabetes; and find out as some post covid cases have not affected at the same treatment, Which then helpful to emerging effective therapeutic system on this concern. The present study has been carried out to estimate the potential of above health claim of functional foods in this new diabetes is concern.

**Methodology:-**As action of plan the standardized tools and precise methodology have been used to archive all the objective of the study as data collection. The work plan has been made on the following manner:

**Area of the Study :-**Different zones of the Kanpur city. Different COVID Hospitals, Clinics etc. were investigated to the study from different localities of the selected zone of city.

## Sampling Design and Techniques

The present study has been carried out on a 30 diabetic patients as sample size. The sample selected from purposive and random sampling technique and the patients those were able to fulfil the purpose of the investigation, had selected as sample, after a general survey. The 30 respondent patients aged 18 to 65 years, included male and female, were selected as sample. 15 patients were included in control group (did not supplemented with functional foods ingredient's mix laddu with medication) and 15 for experimental group (supplemented with functional foods ingredient's mix laddu with medication) from total 30 sample. The patients, those have been consumed more than 2 functional foods in a day were eligible for experimental group.

**Research design:** - An experimental descriptive research approach on the basis of comparative research has been made to carry out the investigations.

**Data collection:**-The collection of data was made from the following methods:

**Collection of review study:** To understand and identified the causes, structure and other facts about this new onset diabetes, the study of review research articles had been made.

**Demographic Particulars:** -Demographic and socio-economic particulars such as family size, age/sex/occupation, income and literacy level of all the individuals, in each of the selected patient. Information had collected by administering survey method through a developed Performa.

**Case study:**-By using developed Performa to achieve the health status of post COVID diabetic respondents, individual patient's profile was made after complete physical and medical examination of subjects. Case History: to assured the onset of diabetes is a consequence of COVID infection, a complete previous information of patients and his/ her family was made.

**Anthropometric Assessment:** -Anthropometric measurements, BMI of patients had taken by measuring height and weight of patients by using standard methods in measurement schedule.

**Biochemical examination:** To constant monitoring of blood glucose levels of the subjects were estimated by using glucometer on different variations.

**Dietary intervention:**- Among the 30 patients 15 were provided laddu (an Indian snack product) prepared with functional foods ingredient's mix dietary supplementation @ of 1 laddu (25g) in a day. The functional food ingredients have a potential to lower blood glucose level such as linseed, black gingili seeds, fenugreek seeds, jaggery and turmeric were used to prepared laddu and in a month dietary intervention.

**Data Analysis :-**After collection of data the percentage, classifications etc, were applied and compare for obtaining the results by suitable statistical methods and tools. Mean, percentage, SD and t test were used to analysis of actual data to revealing the findings of the study.

**Results:-**After analysis of data the results were obtained, some of that present here in following manner:

**1. Assessment of spectrum and etiology of post COVID DM:** -The review studies regarding this new onset diabetes indicated its causes and structure that can be interpreted on the following manner:

On type 1 diabetes and Covid -19 link being investigated, Dr Rahul Baxi (2021), said that the worry is that Covid -19 could trigger a tsunami of diabetes in India after the pandemic is over," He said 8-10% of his patients with no history of diabetes who contracted Covid -19 continued to have high sugar levels months after recovery and were on medication. "Some have borderline diabetes. Others are managing with medicines even a year after recovery," stated by him.

The doctors say, it could be due to the use of steroids in treatment; the cytokine storm when the body's immune system goes into overdrive to fight off the coronavirus; and the virus itself injuring the cells in the pancreas which make insulin.

The study of Dr Anoop Misra, a diabetologist (2021) and co-authors of the study, says the emerging evidence regarding the link in Covid-19 and diabetes presents a "complex" picture. In this study a 555 patients from two hospitals in Delhi and Chennai (Madras) found that those people who had been diagnosed with diabetes after contracting Covid -19 had higher levels of blood sugar than those who had a previous history of diabetes.

Patients have been newly diagnosed with diabetes - using the haemoglobin A1c level test, which gives a three -month average measuring blood sugar during their treatment for Covid -19 in hospital.

Doctors admitted that they are even seeing young patients who did not have blood sugar issues or family history of diabetes developing the disease post -Covid. Dr Joseph K Joseph, consultant internal medicine and diabetologist, had two cases of post -Covid diabetes, a 25 -year-old male and a 15 -year-old- boy. Initially their sugar levels were very high but after two weeks it came down. The good news is that there is fast reduction of sugar levels in Covid -induced diabetes and due to intensive therapy.

Will the people with new onset of diabetes after Covid -19 become lifelong diabetics? The doctors do not know for sure, yet, said by Dr Saboo. He also said a national study is underway to understand the role played by Covid in precipitating diabetes. About the new onset diabetes it is hard to say that this onset is a permanent disease or a temporary metabolic alteration which resolved as inflammation resolved or effects of steroids wore off.

It is observation of doctors that Covid may attack insulin -producing beta cells of pancreas either resulting in cells to fail or impairing their function, triggering high blood sugar levels or diabetes. Steroid use may also trigger it though it is generally temporary," says Dr Phatak.

"The use of corticosteroids leads to blood glucose levels to shoot up not only in diabetics but even those without history. But, we will need long -term follow-up data to see whether this is hyperglycaemia (high sugar levels) after the infection or whether it converts into diabetes.

Various infections like mumps and measles are known to trigger diabetes due to the stress on the body. But now people are talking about Covid -19 directly impacting pancreas, leading to diabetes," said Dr Ambrish Mithal, chairman, department of endocrinology and diabetes, Max Healthcare.

According to doctors, the new onset of diabetes can be because of two reasons – stress due to the infection (cytokine storm is also known to make the body insulin -resistant), or the infection destroying the beta cells in the pancreas.



Mahmoud Nassar, et al. (2021), observed based on available evidence that the prevalence of T1DM in patients with COVID-19 ranged from 0.15% to 28.98%. The most common presentation of COVID-19 in patients with T1DM included fever, elevated blood glucose, dry cough, nausea and vomiting, and diabetic ketoacidosis. The outcomes of COVID-19 in terms of length of hospital stay, hospitalization, ICU admission, DKA rate, and severe hypoglycemia were reported variably in the included studies. Due to the heterogeneous study populations. During the study it has found that number of people newly diagnosed with diabetes, particularly with type 1 diabetes (T1D), has increased since the start of the Covid-19 pandemic. There are a number of ongoing studies investigating this rise in diagnoses. T1D can be precipitated by environmental factors like viruses, and Covid-19 may negatively affect pancreatic function and insulin secretion. Covid-19 may affect insulin-producing cells in the pancreas, either by directly damaging them or as a side effect of inflammation caused by the immune system fighting the virus, leading to T1D. The SARS-CoV-2 virus may also thrive in an environment of elevated blood glucose and could precipitate a relative insulin deficiency, or type 2 diabetes (T2D).

The study found that 13 of 127 patients /or 10% of the cases of mucormycosis had affected by "new onset diabetes". Their average age was around 36 years. Significantly, seven of them were not even given steroids or supplemental oxygen when they were sick with Covid-19. Dr Akshay Nair,(2021), an eye surgeon and one of the researchers, said 'Yet, these patients had elevated blood sugars. This makes us worry about an impending outbreak of diabetes in the coming years."

**2. Demographic status:-**Age group and gender of patients are showing in table no.1.1 and 1.2 respectively. Most of the respondent patients (70%) were belonged to 20 – 30 year age group followed with 23.33 percent from 40 – 50 years age group, as table no. 1.1 shows. The table no. 1.2 shows that maximum (93%) respondents were males and only 7 percent females, affected from new onset diabetes.

**Table No. 2.1 Age group of respondents:**

Age group of respondents ( years)	N = 30	Percentage (%)
20 - 30	21	70
30 - 40	07	23.33
40 - 50	02	6.66

**Table No. 2.2 Gender wise classification of respondents:**

Gender of respondents	N = 30	Percentage (%)
Males	22	73.33
Females	08	26.66

**3. Anthropometric status of patients:** -The mean body mass index ( **BMI= weight in Kg / Height in m<sup>2</sup>**) of respondents were found to be 19.96 kg / m<sup>2</sup> in 20 –30 years age groups, followed by 20.89 and 20.05 kg/ m<sup>2</sup> among 30 – 40 years and 40 –50 years age groups

respectively as showing in table no. 3. These mean value are comes in normal range accept 20 - 30 years age groups, they had slidely low BMI indicating underweight body due to post COVID effects.

**Table No.3 Anthropometry of respondents ( mean BMI value)**

Age groups (years)	Mean BMI (Kg /m <sup>2</sup> )	Normal range BMI (Kg /m <sup>2</sup> )
20 – 30(N=21)	19.96	20- 23
30 – 40 (N=7)	20.89	20 - 23
40 – 50 (N=2)	21.05	20- 23

**4. Biochemical profile of patients on dietary intervention with medication:** -Table no. 4 indicated that comparison of mean blood sugar levels of control and study groups have a significant differences at 0.05 level on 0.001 p - value on all parameters. It indicated that the regular intake of prepared laddu of functional ingredients with medication is more better therapeutic approach than medication alone to control the new onset post COVID diabetes mellitus.

**Table No. 4 Comparison of mean/ average blood glucose levels of two groups after dietary intervention of study group**

**Conclusion:** The results of study has concluded that nutritional intervention with medication is also very effective therapeutic measure in controlling new onset diabetes mellitus appeared aspost COVID consequences. It is proved from the study that the laddu prepared by functional ingredients had a potential to decrease the blood glucose level at fasting, postprandial and random test.

Conditions	Normal blood glucose (mg/dl)	Average blood glucose level (mg/dl) of control patients	Average blood glucose level (mg/dl) of patients of study group	p-value
At random	<140	155.63	141.66	0.001
Fasting	<125	146.43	122.66	0.001
Postprandial	<140	156.66	145.23	0.001

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**A STUDY TO DETERMINE THE KNOWLEDGE AND ATTITUDE  
REGARDING THE ILL-EFFECTS OF SUBSTANCE ABUSE AMONG ITI  
STUDENTS OF SELECTED ITI COLLEGES IN DHARWAD,  
KARNATAKA**

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**THE STUDY'S BACKGROUND**

Alcohol addiction is really a rapidly increasing issue. According to United Nations and indeed the American Psychiatric alcohol abuse is defined as the fraudulent consuming of just about any found in nature medicinal particle for said objective of changes in the way an user believes considers actually acts without explanation considering the destructive mentally and physically end which are already exacerbated.

**Purpose:**

- ✓ To evaluate awareness and attitudes.
  - ✓ To ascertain the relationship but rather causative link for both ITI awareness and knowledge.
- Participant's perceptions such negative consequences of smoking in relation to specific covariates. Its analysis was carried using a qualitative methodology.

**Effects:-**Its reading comprehension test ranking of ITI seniors seems to have been 9.26 with something like a variance of 1.91 and then an average income of 10. An overall average behaviour ranking of ITI educators seems to have been 18.13 with both an error margin of 1.58 and then a variance of 18. And per the degree of awareness within and between Toppers pupils its significant proportion 48 would have appropriate experience but instead 7 could have insufficient information Also 5 of ITIs have sufficient information. University graduates its significant proportion of ITI high school seniors use to have an optimistic response with 32 having a good opinion and 15 having a neutral stance. Only 13 of ITI high school seniors seemed to have a bad view.  $r = 0.48$  indicating there had been a significant strong relationship between awareness and rather disposition.

Since there was positive correlation research hypotheses is accepted. Chi square value is significant between knowledge regarding ill effects of substance abuse. With personal variables like association among the like educational level of students, type of family value is significant between Levels of attitude regarding ill effects of substance abuse.

Intimate data points such as year's old household size fraction of Science stream and thus the remaining part weren't even greater than 0.5.

**Inference:-**The large number of I T I schoolchildren had quite a milder understanding of something like the negative impacts of substances. The majority of I T I understudies had quite a better outlook more towards the bad impacts of substances.

**Search terms: Wisdom, Perception, Stimulant Addiction, ITI Colleges**

**OVERVIEW:**

“Excessive drinking is really an opposing team of striving but instead fingers crossed but rather constantly battling something is waging for said upcoming years”.

Excessive drinking is understood as a set of drug be using whereby the would use this same factual basis through portions but rather methodology that are not okayed carefully monitored by healthcare experts. Addictions are all as old as humanity. Humans all have desired to consume intoxicants which thus cause them to feel easy -going, prompted and elated. 1 Excessive drinking does indeed have a detrimental effect on even a parents including kinship disintegration joblessness academic problems increased sexual assault molestation and some other atrocities.

That is a misalign this frequently has physical injury expressive but rather intellectual consequences for said abusive relationship but instead his close relatives. "Its Degree Motif but rather Fashions of Substance Misuse through Rajasthan Questionnaire " authored through 2004 mostly by Ministry of Human Resource development but instead Emancipation and also the General Assembly Bureau on Violence and Gangs is one of the most exhaustive monitoring. Besides of hard liquor 62.46 million users cannabinoids, 8.75 million users, suboxone including fentanyl hashish naltrexone but instead continues unabated 2.04 million users but instead benzodiazepines 0.29 million users are also the pain killers another very assaulted per the document. Latest pot smokers made up approximately 17% and 20% of the population.

Completely reliant visitors are those who rely on others. Its customers have been mostly humans, according with Faster Evaluation Report which noticed that all 8% of substance abusers seem to have been female. Excessive drinking was more popular among teenagers, unemployed male students but instead vulnerable communities. Alcohol addiction leads to a variety of medical conditions, including fatigue dieting but rather lung infections. Intoxicated judgment but a lack of critical mind -set is two of most serious consequences of a lcohol addiction. Addicts develop

psychological problems such as depression, anxiety and irritability, apart from personality problems.<sup>3</sup>

**OBJECTIVES:**

- To assess the knowledge regarding ill effects of substance abuse among ITI students.
- To assess the attitude regarding ill effects of substance abuse among ITI students.
- To determine the correlation between knowledge and attitude of ITI students regarding the ill effects of substance abuse.
- To find the association between knowledge and attitude of ITI students regarding the ill effects of substance abuse with selected socio demographic variables.

**HYPOTHESES:**

**H<sub>1</sub>:** There will be statistically significant association between knowledge and attitude regarding ill effects of substance abuse among ITI students with selected socio demographic variables.

**H<sub>2</sub>:** There will be statistically significant correlation between knowledge and attitude regarding The ill effects of substance abuse among ITI students with selected socio demographic variables

**ASSUMPTIONS:**

- Most of the ITI Students may have inadequate knowledge regarding ill -effects of substance abuse.
- ITI Students may have negative attitude regarding ill effects of substance abuse.
- Certain demographic variables may influence on knowledge and attitude on ill -effects of substance abuse.

**LIMITATIONS:-**Study was limited to

- Selected ITI colleges in Dharwad, Karnataka.
- Study duration was limited for 2 weeks.
- Study was limited to those who were available at the time of data collection.
- Students who were willing to participate in the study.

**MATERIALS AND METHODS:**

**Research approach:** Quantitative approach was used for this study.

**Research design:** The research design used in this study was descriptive design.

**Settings of the study:** The study was conducted in selected ITI Colleges in Dharwad.

**Population:** The population consists of ITI Students from selected ITI College in Dharwad.

**Sample size:** Total number of samples size is 60.



**Sampling techniques:**-Convenient sampling technique.

**Source of Data:** The data was collected from ITI students.

**Method of data collection:**-Administered Structured knowledge questionnaire and semi Structured attitude scale was used for data collection.

**Plan for data analysis:** Descriptive and inferential statistics

### **SAMPLING CRITERIA:**

#### **Inclusion criteria:**

- ITI Students who were willing to participate.
- ITI Students who were available during the study

#### **Exclusion criteria:**

- ITI Students who were sick at the time of data collection.

### **VARIABLES:**

**Study variables:**-knowledge and attitude

**Demographic variable:**-Age, sex, education status, economical status, area of residence etc.

### **INSTRUMENTS INTENDED TO BE USED:**

- Structured knowledge questionnaire to assess the knowledge
- Attitude scale to assess the attitude

### **DEVELOPMENT OF THE TOOL:**

The tool was developed by the investigator based on

- ✓ Research problem
- ✓ Extensive review of related literature
- ✓ Discussion and Suggestions from the guide and experts
- ✓ Based on the level of understanding of the students
- ✓ Preparation of blue prints

### **Ethical considerations:**

- Permission was obtained from the institutional ethical committee to carry out the study.
- The subjects were explained about the purpose and nature of the study
- Written informed consent was obtained from the subjects before preceding the study.

### **DESCRIPTION OF THE TOOLS:**

The tool designed for the study consists of

**Part A:** - Socio-demographic data.

**Part B:** - Structured questionnaire to assess the knowledge regarding ill effects of substance abuse.

**Part C:-** Three points rating scale to assess the attitude regarding ill effects of substance abuse.

**CONTENT VALIDITY OF TOOL:-**In order to obtain the content validity of the tool, prepared item along with the problem statement, objectives, operational definition and scoring pattern, were submitted to experts from the field of psychiatric, psychologist and Nursing departments experts there was 100% agreement by all experts on all the items. Content validated by seven experts such as Doctors, Nursing educators, psychologist, social worker there was 100% agreement by all experts.

**RELIABILITY OF THE TOOL:** -The structured knowledge and attitude questionnaire was used and reliability of the tool was checked by the test retest method, the reliability of the knowledge tool was found to be 0.80. The attitude tool was found to be adequately reliable with a 0.98 among ITI students regarding ill effects of substance abuse. The reliability of the tool was computed by using Karl Pearson Correlation technique.

**DATA COLLECTION PROCESS:** -Written permission was obtained from Ethical Clearance Committee who were informed about the nature and importance of the study. The exact time and date planned with Principal of SDM Institute of Nursing Sciences and was communicated to the students. Prior to data collection, the investigator familiarized themselves with the subjects and explained the purpose of the study to them. The participants were requested for full cooperation and were assured for confidentiality of their responses.

#### **REVIEW OF LITERATURE:**

Literature review for the present study has been collected and presented under the following headings:

1. Literature related to substance abuse.
2. Literature related to knowledge and attitude of substance abuse.
3. Literature related to ill effects of substance abuse.

#### **RESULTS:**

Data was analyzed by using descriptive and inferential statistics. The analysis of the data organized under the Following section

**SECTION-1 Descriptive** of the base line variables. Frequency and percentage distribution of the socio demographical variables such as age, religion, educational level of the students, place

of the residence, type of family, present place of students residence, parental education and occupation, total income of family per month, anybody in your family uses substance abuse, source of knowledge about substance abuse, have anyone in your family attended tobacco control program.

**SECTION – II THE MEAN, MEDIAN, STANDARD DEVIATION OF ITI STUDENTS ABOUT KNOWLEDGE AND ATTITUDE REGARDING ILL EFFECTS OF SUBSTANCE ABUSE.**

Tools	Mean	Median	S.D
Knowledge	9.26	10	1.91
Attitude	18.13	18	1.58

The knowledge mean score of ITI Students was 9.26 with Standard deviation of  $\pm 1.91$  median of 10. The attitude. Mean score of ITI Students was 18.13 with Standard deviation of  $\pm 1.58$  median of 18.

**SECTION – III KNOWLEDGE OF ITI STUDENTS REGARDING ILL EFFECTS OF SUBSTANCE ABUSE.**

**n=60**

Level of knowledge & Score	Frequency	Percentage
Inadequate (1-10)	07	11.66%
Moderate (11-20)	48	80%
Adequate (21-30)	05	8.33%
Total	60	100%

The data in table-3 shows the distribution of study subjects according to the level of Knowledge among ITI students majority 48(80%) had moderate knowledge and in adequate knowledge 7 (11.66%) Adequate knowledge only 5(8.33%) of ITI students.

**SECTION – IV ATTITUDE OF ITI STUDENTS REGARDING ILL EFFECTS OF SUBSTANCE ABUSE.**

Levels of attitude	Frequency	Percentage
Negative attitude	13	21.66%
Favorable attitude	15	25%
Positive attitude	32	53.33%
Total	60	100%

The data in table-4 shows the distribution of study subjects according to the level of attitude among ITI students majority 32(53.33%) had Positive attitude and moderate 15(25%) Favourable attitude only 13(21.66%) of ITI students had Negative attitude.

#### **SECTION –V CORRELATION BETWEEN KNOWLEDGE SCORE AND ATTITUDE SCORE.**

knowledge	Attitude	Karl Pearson's coefficient of correlation.
13.9	<b>31.9</b>	<b>0.48</b>

Table 5 reveals that  $r = 0.48$  ( $0 < r < +1$ ), hence there was moderately positive correlation between knowledge and attitude since there was positive correlation research hypotheses is accepted.

#### **SECTION - VI CHI-SQUARE KNOWLEDGE AND ATTITUDE VALUES AMONG ITI STUDENTS ACCORDING TO THEIR SELECTED PERSONAL VARIABLES.**

Chi square value is significant between Levels of knowledge regarding ill effects of substance abuse. with personal variables there was significant association among the like educational level of students, type of family and rest all were not significant at 0.05 levels.

Chi square value is significant between Levels of attitude regarding ill effects of substance abuse. With personal variables like age, type of family, Percentage of SSLC and rest all were not significant at 0.05 levels. Therefore the finding rejects the null hypothesis and accepts the research hypothesis.

#### **CONCLUSION**

- Majority of I T I Students had moderate knowledge regarding ill effects of substance.
- Most of I T I Students had positive attitude towards ill effects of substance.

### **NURSING IMPLICATION**

The findings of the study have several implications for nursing practice, nursing education, nursing administration and nursing research. We nurses have a vital role to determine the knowledge and attitude regarding ill effects of substance abuse among ITI students. In relation to these aspects the appropriate care needs to be provided to ITI college students. It is mandatory that a comprehensive care is to be provided to the younger generation in order to lead them towards healthy life style practices by motivating them to stay away from the influences of substance abuse.

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## Study of the Concept of Dimensionality Reduction in Text mining

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**Abstract** –In the text mining discipline, isolation of relevant dimensions decides the successful performance of data analytics. This study aimed at describing basic methods of dimensionality reduction, which are statistical or semantic based approaches and those can be combined with current trends in technologies. Evolution is achieved in proliferation of data analytics field by applications of overlapping fields such as machine learning, genetic algorithms, neural networks and deep learning all of which are the sub-fields of artificial intelligence in broader view. Experiments from future researchers definitely enhance the efficiency of dimensional reduction.

**Keywords:**-Text Mining; Feature Extraction; Feature Selection; Feature Minimizing; Dimensionality Reduction.

**1. Introduction :-**Data Analytics is the buzz word today. Rapidly generating data happens to be like a treasure for organizations in getting insights for directed decisions, finding out hidden patterns and current trends in relation with their business. Digital information generated by all sorts of sources and fields were literally flooding from all directions. Increasing use of internet and social media from all strata of society is pouring in to it. This information or data is of different types such as numeric, text, images, audio, video. This expeditiously generating, voluminous data needed to be analyzed. But assimilation of data will not allow to apply uniform tools and techniques for investigation. Well organized, structured data can be processed using conventional data mining techniques to successfully achieve the results. Substantial volume of unstructured, textual data necessarily be evaluated by text mining techniques, which could be thought of as an extension to the data mining techniques. Unstructured data can be reorganized in structured form, by employing variety of tools and techniques of text mining field, can be further analyzed devising data mining algorithms and methodologies. However, when data has converted into structured format, cannot be taken directly for further processing like classification or categorization because of the high dimensionality problem. Converted structured data when represented in the matrix form, resultant matrix generally be sparse in nature having large dimensions that is large number of variety of terms or features or columns. These high dimensional matrices if taken for processing in the text mining pipeline has two main disadvantages as firstly, it increases computational burden on resources like processor and memory and may lower the speed for processing and secondly, outcome may lack precision. So recently, researchers were focusing these issues and many a times machine learning algorithms were tried and tested for data analysis. Text mining is an inter-disciplinary field, which depends on information retrieval, data mining, machine learning, parameter statistics and computational linguistics (Kadhim et al. 2014). Due to technological advancements in related fields, boundaries of these inter-related fields were becoming thinner. Segregation of significant terms and those which were irrelevant to the domain is the main aim of the concept of dimensionality reduction. With reduced number of features text processing would be performed more efficiently and rapidly with less expenses. In the next section literature review is been described, after that in the third section detailed study about dimensionality reduction has been given. And in the last section, limitations of the study along with conclusion and future scope has been discussed.



## 2. Review of Literature

**Elmaizi et al. (2019)** This is a study on the basis of information gain technique for dimensionality reduction before employing classification algorithm of hyperspectral images collected from hyperspectral sensors. The challenge of high dimensionality of spectral data has been focused by author, by proposing a new technique for dimensionality reduction. This new approach, applies the policy for selecting useful informative bands and eliminating insignificant bands as support vector machine classifier technique is then used along with information gain function. The outcome of the study signifies the use of this new approach over the other two with not only lessening the computational cost but also enhanced the classification efficiency.

**Kontonatsios et al. (2020)** This paper talked about novel approach for feature representation by feature extraction from text documents. An automatic text classification method had been devised to rank citations according to their relevance to minimize manual labeling labor tangled in citation screening. The new method had been based on neural network-based feature extraction and uses supervised learning technique for feature extraction from text documents and then supervised classification algorithm had been applied to the refined data. Actually, this new method creates feature representation out of given text. In the result of the study, substantial amount of performance gain had been achieved over the currently used feature extraction technique.

**Xu et al. (2016)** In this study the topic of limitations in illustrating microblog text, because of sparse data nature, had been discussed. Interdisciplinary deep network method from deep learning had been employed to reduce the dimensions of the data. Semantic similarity concept had also been applied for improvement in outcome of dimensional reduction. Two new approaches were introduced in the deep network algorithm as modifying training data and modifying training objectives. Findings in the study demonstrated that, over the traditional methods for topic modeling, the novel approach achieved enhanced results and would improve learning about microblog-specific information.

**Sancheti et al. (2018)** In this paper researchers have studied comparative analysis of strategies of dimensional reduction using hybrid approach combining advantages of statistical and semantic approach in the aim of increasing performance of data analytics. Authors concluded that this technique will not only aids in minimizing dimensions but also performs semantic check.

**Wijayasekara, D., McQueen M. (2013)** This study aimed at new approach to select dimensionalities in text data mining algorithms blending information gain technique with artificial intelligence based genetic algorithms employing mutation on dimensions for optimal selection of dimensions. The outcome indicates considerable enhancement of new approach over the standard feature selection methods.

**Kadhim et al. (2014)** To deal with the challenge of high dimension which degrade the performance of text categorization had been researched by introducing a novel technique for efficient preprocessing and feature reduction method. Authors had executed TF-IDF along with singular value decomposition (SVD) algorithms for dimensionality reduction which aids document clustering with k-means clustering method. Ultimately, the exploratory findings

demonstrate that the tested novel technique improved the effectiveness of clustering the English text documents.

### 3. Text Mining and Dimensionality Reduction (DR)

#### 3.1 Need of DR: The Curse of Dimensionality

During data analysis using text mining techniques, data have to undergo different tasks sequentially, known as text mining pipeline. Data collection is the first task in the process. Collected data may contain unwanted or missing data or noise that could be removed using pre-processing task. Pre-processing task is like the heart of text mining process as the effective and efficient outcome of the text mining process largely depends upon successful pre-processing.

Pre-processing may involve sub tasks such as noise removal, text cleansing, text normalization, tokenization, stop word removal, stemming, lemmatization. According to the requirement and as per the domain of data, these sub-tasks were employed upon data. After successful pre-processing refined data is now ready for conversion into structured form for further processing like data exploration and visualization.

Next process is vector representation of data, also known as vectorization, carried out applying various text mining techniques like Term-Document matrix, which will represent the data generally in numeric format in terms of matrix representation. Matrix could be Term-Document matrix (TDM) or Document-Term matrix (DTM) where one is the transpose of the other. Here terms are the tokens from the text documents and each cell represents the frequency of that particular token or term in respective matrix in rows and column format, where if terms were columns, then documents could form rows and vice-versa. And now this structured form data can be taken further for content analysis by applying various techniques as per the aim of the study, such as dictionary-based techniques or algorithmic techniques (viz. supervised for classification or unsupervised for clustering) or for predictive modeling.

The structured data thus transformed has high dimensionality problem that is data is represented in a very large size matrix, sometimes the dimensions are in thousands. The reason is while transforming data from text documents to matrix form all unique term's frequencies were considered. These terms are also called as features or factors. But not all the features were relevant to analysis and redundant features needed to be removed as these irrelevant features can lead to computational overheads and causing waste of resources. Furthermore, this redundant data produces imprecise results because of the problem of over-fitting. This is the challenge to practitioners and researchers in the area of text mining and data analytics.

#### 3.2 Process of DR

DR techniques mainly categorized in two wide classes as

- a. **Feature Selection:** This approach intended to identify subgroup of most relevant features (variables) out of the original dataset. It can be employed using three approaches as filtering, wrapper and embedded method.

Filter method is when out of large set of features, most relevant features were incorporated to form an optimum subset to be taken for further processing. These methods were simple, quick

and cost-effective yet applicable in eliminating irrelevant, duplicate features. Diverse methods can be applied for feature selection like statistical -based information gain, fisher's score, correlation coefficient, mutual dependence, ANOVA or CHI SQUARE tests etc. But would be disadvantageous if the dataset will be having interdependent features.

In wrapper method, concept of greedy algorithm is employed where out of large dataset, various combinations of features were compared for finding most suitable feature subset. This is a recursive process. Wrapper methods are more efficient than filter methods but flaw is excessive computations needed. Types of wrapper methods were forward selection, backward elimination, recursive feature elimination and so on.

Embedded method is a blend of filter method and wrapper method. Here formation of subset will be done by filter method and then wrapper technique is employed to find optimal subset. These methods attempt to leverage the advantages of both the methods along with minimizing the limitations of them. Regularization, Tree-based methods are examples of embedded methods.

**b. Feature Extraction:** This approach target on reducing redundancy from original dataset. Data transformation from high -dimension to low -dimension is been implemented where formation of new features takes place by combining existing features. This data transformation can be linear or non-linear method.

Various statistical-based approaches were existing such as Principal Component Analysis (PCA), Independent Component Analysis (ICA) along with its variants like Sparse-PCA, Neural-PCA and IPCA. These methods were having advantages like minor subtleness to noise, reinforce understandability, competency. Variants of these methods endeavor to overcome some of these discrepancies. There were certain shortcomings of statistical -based methods such as inability in sorting features, immense clarifications and unable to consider semantics (meaning) of terms.

Semantic-based feature extraction approaches includes Word Net which uses ontology and Latent Semantic Analysis (LSA) which is mathematical based approach combined with Word Net. As compared to statistical -based approaches, semantic -based approaches are advantageous as they consider semantics (meaning) checks but can be computationally expensive. In the study of Sancheti et al. (2018), researchers successfully attempted combining statistical and semantic technique, which is the improvement in the text mining field.

In the process of evolution researchers now focuses on new combinations of feature extraction methods. In Kontonatsios et al. (2020) neural network-based approach has been studied, which is artificial intelligence -based approach, definitely an advancement in the feature selection. Likewise, in the Xu et al. (2016), novel method from the deep learning discipline has been employed successfully.

#### 4. Conclusion

This is a short study on the dimensionality reduction techniques in data analytics. Here a quick revision is presented for the successful evolution of dimensionality reduction by convergence of advanced disciplines like artificial intelligence -based algorithms from the sub fields such as machine learning, genetic algorithms, deep learning and neural networks. Semantic classification, processing of meta information, effects of dataset size on analysis could be possible areas of research in future. However, limitation of this study is whenever researchers

want to employ these techniques in their research work, a detailed study of suitable method is needed for future work.

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## Effect of various temperatures on optical, magnetic and structural properties of Sol-Gel synthesized $Mg_{0.7-x}Ni_xZn_{0.3}$ ( $x=0.2$ and $0.4$ ) ferrite

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**Abstract:**-The sol-gel method was used to synthesize nanoparticles of magnesium -nickel-zinc ferrites with the general formula  $Mg_{0.7-x}Ni_xZn_{0.3}$  ( $x=0.2$  and  $0.4$ ). X-ray diffraction analysis was used to assess phase formation. UV (ultraviolet -visible) spectroscopy and Vibrating sample magnetometer (VSM) techniques were used to study the samples optical and magnetic properties. The ferrite nanoparticles were sintered for 2 hours at temperatures of  $800^\circ\text{C}$  and  $1000^\circ\text{C}$ . Sintering temperature has a significant impact on the structural, optical, and magnetic properties of Mg-Ni-Zn ferrites, according to this study.

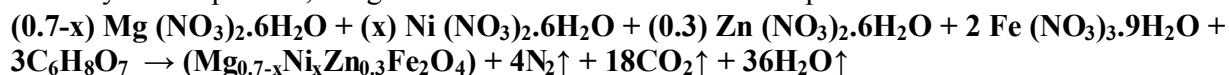
**Keywords:** Mg-Ni-Zn Ferrites, Magnetization, UV, VSM, Sol-gel method.

**1. Introduction:**-Ferrites are a type of mixed metal oxide that primarily contains iron oxide [1]. The spinel structure is found in the majority of ferrites. The general formula for spinel is  $AB_2O_4$  [2]. Soft magnets are formed by ferrites with narrow hysteresis loops and are utilized in audio transformers, television transformers, gyrators, and inductance cores. Ferrite nanoparticles have a high electrical resistance because they respond better at high frequencies [3]. Ferrites have a unique property of having a high surface to volume ratio, which allows them to utilize the nano magnetism phenomenon [4]. Preparation techniques are very important in determining the properties of ferrites. The sol-gel process has numerous advantages over other ways for obtaining ferrite with appropriate nano architecture [5]. The goal of this study is to use the sol-gel method to synthesize magnesium -nickel-zinc ferrites nanoparticles with the chemical formula  $Mg_{0.7-x}Ni_xZn_{0.3}$  ( $x=0.2$  and  $0.4$ ). This approach can synthesize ferrite nanoparticles with a single phase structure. XRD, FTIR and SEM investigations can be used to investigate the structural and morphological properties of ferrite nanoparticles.

### 2. Experimental Work

**2.1. Synthesis:**-The spinel ferrites  $Mg_{0.7-x}Ni_xZn_{0.3}$  ( $x=0.2$  and  $0.4$ ) were prepared utilizing high purity analytical grade magnesium nitrate, zinc nitrate, nickel nitrate, ferric nitrate, and citric acid in a sol-gel technique. The metal nitrate to fuel ratio is taken as 1:3. Ammonia solution is used to modify the pH of the solution to 7. The produced solution was agitated on a magnetic stirrer to form a gel. After 4-5 hours, it turns from gel to ash. The synthesized ferrite powders were sintered for 2 hours at  $800^\circ\text{C}$  and  $1000^\circ\text{C}$ .

In the synthesis process, the general chemical reaction can be represented as



**2.2 Instrumentation:**-X-Ray Diffraction techniques were used to evaluate the produced nano crystalline samples at room temperature, utilizing a Philips powder X-Ray Diffractometer (model PW3710) with  $CuK\alpha$  radiations of wavelength  $1.5406 \text{ \AA}$ . Scanning Electron Microscopy (SEM) techniques were used to determine the morphological behavior of the studied samples. In the region of  $4000-400 \text{ cm}^{-1}$ , Fourier Transform Infrared (FTIR) spectra were collected. Optical and magnetic properties were investigated using a vibrating sample magnetometer and UV-visible spectroscopy.

### 3. Result and Discussion

### 3.1 Structural Characterization:

#### 3.1.1 XRD Studies:

Figure 1 shows the X-ray diffraction (XRD) patterns of  $\text{Mg}_{0.7-x}\text{Ni}_x\text{Zn}_{0.3}$  ( $x=0.2$  and  $0.4$ ). All samples show a single phase cubic spinel structure, according to XRD patterns. The JCPDS patterns of cubic spinel ferrite match closely with all of the reported XRD peaks [6].

The formula was used to calculate the lattice constants is given below.

$$a = d_{hkl} \times \sqrt{h^2 + k^2 + l^2}, \text{The miller indices are represented by (hkl).}$$

The formula was used to compute the X-Ray densities of each sample is

$$D_x = \frac{8M}{Na^3}, \text{ where M is the molecular weight of the sample, N denotes Avogadro's number, and } a$$

denotes the lattice constants. The following formulas are used to determine the ionic radii on the tetrahedral A and octahedral B sites:

$$R_A = \left(u - \frac{1}{4}\right) \cdot a \cdot 3^{\frac{1}{2}} - r(\text{O}^{2-}),$$

$$R_B = \left(\frac{5}{8} - u\right) \cdot a - r(\text{O}^{2-}), \text{The oxygen ionic radii are indicated by } r(\text{O}^{2-}).$$

The length of the metal oxygen bond  $A-O$  on the tetrahedral site was calculated using the formula below.

$$A-O = \left(u - \frac{1}{4}\right) \cdot a \cdot 3^{\frac{1}{2}} \text{ The oxygen ion parameter is represented by the symbol } u.$$

The equation below is used to compute the bond length  $B-O$  on the octahedral site.

$$B-O = \left(\frac{5}{8} - u\right) \cdot a, \text{ The oxygen ion parameter is symbolized by the character } u.$$

As illustrated in the tables 4 and 5 below, X-Ray densities, bond lengths, and ionic radii change significantly as sintering temperatures change [6].

**3.1.2 INFRARED SPECTROSCOPIC STUDIES:** -Two prominent absorption bands  $\nu_1$  and  $\nu_2$  in the ranges of  $600$  and  $400 \text{ cm}^{-1}$  can be seen in the spectra of all the samples sintering at  $800$  and  $1000^\circ\text{C}$ . By emphasizing two significant absorption bands about  $600 \text{ cm}^{-1}$  and  $400 \text{ cm}^{-1}$ , which are prevalent in spinel ferrites, the FTIR findings confirmed the spinel structure of Mg-Ni-Zn ferrites [7-9]. Because of changes in crystalline field effect and lattice strain, the intensity and peak positions of these modes fluctuate with sintering temperature. As the  $\text{Ni}^{2+}$  content rises, a small change in the band frequency towards higher values can be seen [6].

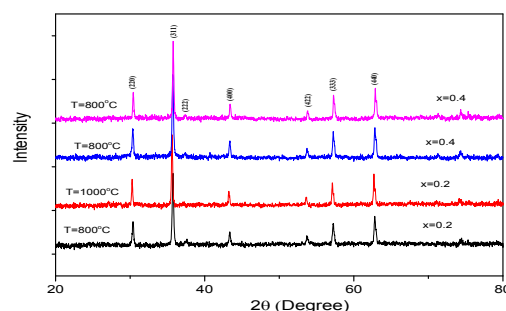


Figure 1: XRD Pattern of Mg-Ni-Zn ferrite system

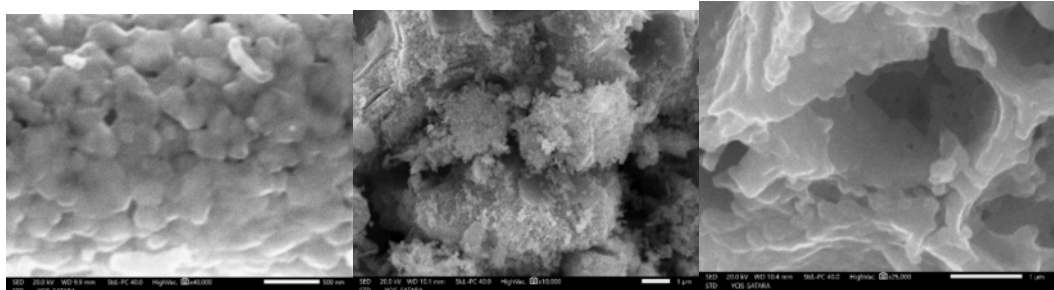
#### 3.1.3 Scanning Electron Microscopy (SEM) Analysis:

$x=0.2$   $T=800^\circ\text{C}$

$x=0.4$   $T=800^\circ\text{C}$

$x=0.2$   $T=1000^\circ\text{C}$





**Fig. 2 SEM images.**

SEM images of Mg-Ni-Zn ferrite samples sintered at 800 °C and 1000 °C were used to study the surface morphology, as shown in the above figures 2. All of the compositions sintered at two different temperatures had a similar morphology, with a greater number of irregularly shaped grains, according to micrographs. The micrographs of the samples sintered at 800 °C and 1000 °C shows that surface morphology is full of big grains and small pores [6,10].

**4. VSM CHARACTERIZATION (HYSTERESIS LOOP):** -As shown in the tables 6 below, saturation magnetization (Ms) increases as sintering temperatures increase, although coercivity (Hc) values reduces [6].

**5. UV SPECTROSCOPY:** -The optical properties of magnesium-nickel-zinc ferrite were investigated using the UV-Visible absorption spectrum.

The band gap energy  $E_g$  (eV) of the synthesized ferrite system is calculated by the following equation:

$$E_g = \frac{hc}{\lambda_{max}} = \frac{1240}{\lambda_{max}}$$

Where  $h$  is the Planck constant ( $6.62 \cdot 10^{-34} \text{ J} \cdot \text{s} \cdot \text{photon}^{-1}$ ),  $c$  is the speed of light ( $3 \cdot 10^8 \text{ m} \cdot \text{s}^{-1}$ ), and  $\lambda_{max}$  is the wavelength at the absorption edge (nm), respectively. As the sintering temperature increases, the band gap value decreases. [10-11].

**Table: 4**

x=0.2 (Mg <sub>0.5</sub> Ni <sub>0.2</sub> Zn <sub>0.3</sub> )	Temperature (°C)	Lattice Constants (A.U.)	X-ray density (gm/cm <sup>3</sup> )	Bond length (Å <sup>0</sup> )		Ionic radii	
				A-O	B-O	R <sub>A</sub> (Å <sup>0</sup> )	R <sub>B</sub> (Å <sup>0</sup> )
				1000	8.356601	4.98895648	1.809257
800	8.326387	5.043464968	1.802716	2.081597	0.282716	0.561597	

**Table: 5**

x=0.4 (Mg <sub>0.3</sub> Ni <sub>0.4</sub> Zn <sub>0.3</sub> )	Temperature (°C)	Lattice Constants (A.U.)	X-ray density ( gm/cm <sup>3</sup> )	Bond length (Å <sup>0</sup> )		Ionic radii	
				A-O	B-O	R <sub>A</sub> (Å <sup>0</sup> )	R <sub>B</sub> (Å <sup>0</sup> )
				800	8.225229	5.396028587	1.780814
1000	8.321942	5.210077909	1.801753	2.080486	0.281753	0.560486	

**Table: 6**

x=0.2 (Mg <sub>0.5</sub> Ni <sub>0.2</sub> Zn <sub>0.3</sub> )	Temperature (°C)	Saturation magnetization M <sub>s</sub> (emu/gm.)	Coercivity H <sub>c</sub> (Oe)	Band Gap (eV)

	1000	069.6250	025.8086	1.67
	800	060.8000	396.2014	1.71
$x=0.4$ ( $Mg_{0.3}Ni_{0.4}Zn_{0.3}$ )	800	062.1500	067.5305	1.67
	1000	062.6667	056.4863	1.64

**Table 7: Data about the FTIR absorption bands positions ( $\nu_1$ ,  $\nu_2$ )**

$x=0.2$ ( $Mg_{0.5}Ni_{0.2}Zn_{0.3}$ )	Temperature ( $^{\circ}C$ )	$\nu_1$ ( $cm^{-1}$ )	$\nu_2$ ( $cm^{-1}$ )
	800	564	414
1000	571	420	

**Table 8: Data about the FTIR absorption bands positions ( $\nu_1$ ,  $\nu_2$ )**

$x=0.4$ ( $Mg_{0.3}Ni_{0.4}Zn_{0.3}$ )	Temperature ( $^{\circ}C$ )	$\nu_1$ ( $cm^{-1}$ )	$\nu_2$ ( $cm^{-1}$ )
	800	570	416
1000	575	425	

**6. Conclusion:** -The  $Mg_{0.7-x}Ni_xZn_{0.3}$  ( $x=0.2$  and  $0.4$ ) nano ferrite system was synthesized using the sol-gel method. As the sintering temperature changes, the structural, magnetic, and optical properties of ferrites with the composition  $Mg_{0.7-x}Ni_xZn_{0.3}$  (where  $x = 0.2$  and  $0.4$ ) changes significantly.

**Conflicts of Interest:** The authors declare that they have no conflicts of interest.

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## The effect of different temperatures on the optical, magnetic, and structural properties of $Mg_{0.7-x}Ni_xZn_{0.3}$ ( $x=0.6$ ) ferrite synthesized using Sol-Gel route

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**Abstract:** Nanoparticles of magnesium -nickel-zinc ferrites with the general formula  $Mg_{0.7-x}Ni_xZn_{0.3}$  ( $x=0.6$ ) were synthesized using the sol-gel process. Phase formation was assessed using X-ray diffraction analysis. The samples optical and magnetic properties were investigated using UV (ultraviolet –visible) spectroscopy and a vibrating sample magnetometer (VSM). At temperatures of 1000°C and 800°C, the ferrite nanoparticles were sintered for 2 hours. According to this study, the sintering temperature has a substantial impact on the structural, optical, and magnetic properties of Mg–Ni–Zn ferrites.

**Keywords:** Mg-Ni-Zn Ferrites, Band gap, Sintering temperature, Sol-gel method.

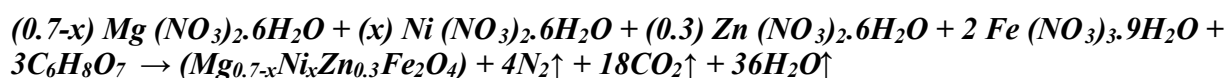
**1.Introduction:-** Because of their extremely small size or large specific surface area, nanostructured materials have remarkable physical and chemical properties that are markedly different from those of conventional bulk materials. As a result, in the last decade, their preparation and characterization have gotten a lot of attention. Because of its advantages, such as superior stoichiometric control and the manufacture of ultrafine particles with a narrow size distribution in a relatively short processing time at lower temperatures, the sol –gel method is a viable and appealing technology for the preparation of nanosized particles [1]. Sol -gel synthesis is a versatile chemical approach that enables the production of nanoparticles, resulting in a new class of unique materials. The nitrates of the constituent metal ions and a suitable chelating agent (fuel), such as urea/glycine/citric acid, are employed as the starting materials in the sol –gel process, which is also known as sol -gel auto combustion, sol -gel auto ignition, or sol -gel self-combustion [2]. The purpose of this research is to synthesize magnesium –nickel-zinc ferrites nanoparticles with the chemical formula  $Mg_{0.7-x}Ni_xZn_{0.3}$  ( $x=0.6$ ) using the sol -gel process. The structural and morphological properties of ferrite nanoparticles can be investigated using XRD, FTIR, and SEM.

## 2.Experimental Work

### 2.1. Synthesis

Using high purity analytical grade magnesium nitrate, zinc nitrate, nickel nitrate, ferric nitrate, and citric acid, the spinel ferrites  $Mg_{0.7-x}Ni_xZn_{0.3}$  ( $x=0.6$ ) were prepared in a sol-gel method. The ratio of metal nitrate to fuel is 1:3. The pH of the solution is changed to 7 by adding ammonia solution. A magnetic stirrer was used to stir the resulting solution into a gel. It transforms from gel to ash in about 4 -5 hours. The synthesized ferrite powders was sintered for 120 minutes at 800°C and 1000°C.

The general chemical reaction in the synthesis process can be represented as:

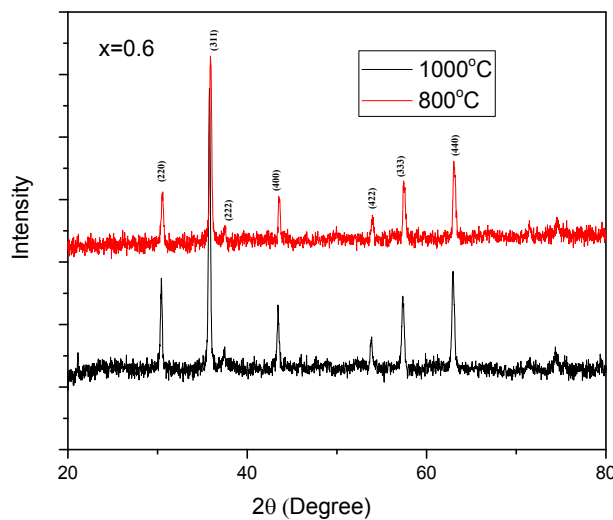


**2.2 Instrumentation:** -A vibrating sample magnetometer (VSM) and UV –visible spectroscopy were used to examine optical and magnetic properties. The structural and morphological properties of ferrite nanoparticles can be investigated using XRD, FTIR, and SEM.

### 3. Result and Discussion

#### 3.1 Structural Characterization:

##### 3.1.1 XRD Studies:



**Figures 1: the XRD patterns of  $Mg_{0.7-x}Ni_xZn_{0.3}$  ( $x=0.6$ )**

Figures 1 shows the XRD patterns of  $Mg_{0.7-x}Ni_xZn_{0.3}$  ( $x=0.6$ ) composition. All of the samples have single phase spinel cubic, according to XRD patterns. All of the Bragg's angles of the associated peaks in the XRD pattern closely match the reflection peak characteristics of Mg-Ni - Zn ferrites reported in JCPDS by Barakat, m et al., J. Therm Anal 37.241. (1991). Planes (220), (311), (222), (400), (422), (333), and (440) show that all of the samples have a cubic spinel structure [3, 4].

The formula was used to calculate the lattice constants is given below.

$a = d_{hkl} \times \sqrt{h^2 + k^2 + l^2}$ , The miller indices are represented by (hkl).

The formula was used to compute the X-Ray densities of each sample is

$D_x = \frac{8M}{Na^3}$ , where M is the molecular weight of the sample, N denotes Avogadro's number, and a denotes the lattice constants. The following formulas are used to determine the ionic radii on the tetrahedral A and octahedral B sites:

$$R_A = \left(u - \frac{1}{4}\right) \cdot a \cdot 3^{\frac{1}{2}} - r(O^{2-}),$$

$$R_B = \left(\frac{5}{8} - u\right) \cdot a - r(O^{2-}),$$

The length of the metal oxygen bond A –O on the tetrahedral site was calculated using the formula below.

$A-O = (u - \frac{1}{4}) \cdot a \cdot 3^{\frac{1}{2}}$  The oxygen ion parameter is represented by the symbol  $u$ .

The equation below is used to compute the bond length B–O on the octahedral site.

$B-O = (\frac{5}{8} - u) \cdot a$ , The oxygen ion parameter is symbolized by the character  $u$ .

As illustrated in the tables 4 and 5 below, X-Ray densities, bond lengths, and ionic radii change significantly as sintering temperatures change [4].

### 3.1.2 Infrared Spectroscopic Studies:

Two prominent absorption bands  $\nu_1$  and  $\nu_2$  in the ranges of 600 and 400  $\text{cm}^{-1}$  can be seen in the spectra of all the samples sintering at 1000 and 800  $^{\circ}\text{C}$ . By emphasizing two significant absorption bands nearly 600  $\text{cm}^{-1}$  and 400  $\text{cm}^{-1}$ , which are prevalent in spinel ferrites, the FTIR findings confirmed the spinel structure of Mg-Ni-Zn ferrites [5-7].

### 3.1.3 Scanning Electron Microscopy (SEM) Analysis:

The surface morphology of Mg-Ni-Zn ferrite samples sintered at 800  $^{\circ}\text{C}$  and 1000  $^{\circ}\text{C}$  was examined using SEM pictures as shown in figures 2. Micrographs demonstrated that all of the compositions sintered at different temperatures had a morphology with a greater number of irregularly shaped grains. These were seemed to be stones like nanosized grains. Surface morphology is full of big grains and small pores. In fact, the unsystematic grain growth seen in Mg-Ni-Zn samples can be attributable to various synthesis circumstances, reaction, concentration, micro strain, grinding procedure, and so on [4, 8].

## 4. VSM Characterization (Hysteresis loop):

From the hysteresis loop it is detected that saturation magnetization ( $M_s$ ) increases as sintering temperatures increase, although coercivity ( $H_c$ ) values decreases of  $\text{Mg}_{0.7-x}\text{Ni}_x\text{Zn}_{0.3}$  ( $x=0.6$ ) samples sintered at 800  $^{\circ}$  and 1000  $^{\circ}\text{C}$  [4]. The value of saturation magnetization ( $M_s$ ) and coactivity ( $H_c$ ) is shown in table 3.

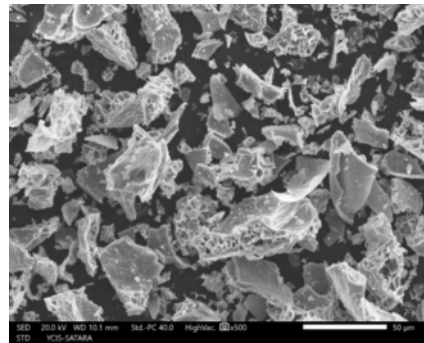
**5. UV SPECTROSCOPY:** The optical properties of magnesium-nickel-zinc ferrite were investigated using the UV-Visible absorption spectrum.

The band gap energy  $E_g$  (eV) of the synthesized ferrite system is calculated by the following equation:

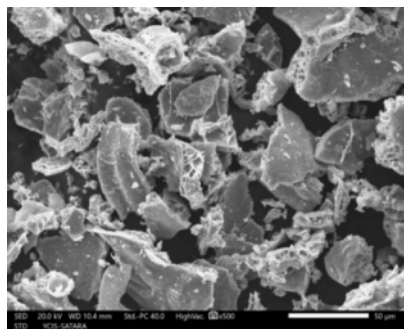
$$E_g = \frac{h \cdot c}{\lambda_{max}} = \frac{1240}{\lambda_{max}}$$

Where  $h$  is the Planck constant ( $6.62 \cdot 10^{-34} \text{ J} \cdot \text{s} \cdot \text{photon}^{-1}$ ),  $c$  is the speed of light ( $3 \cdot 10^8 \text{ m} \cdot \text{s}^{-1}$ ), and  $\lambda_{max}$  is the wavelength at the absorption edge (nm), respectively. From the UV-Visible absorption spectrum it is concluded that as the sintering temperature increases, the band gap value decreases [8,9]. The band gap values are given in table 3.

**x=0.6 T=1000 $^{\circ}\text{C}$**



$x=0.6$   $T=800^{\circ}\text{C}$



**Figure 2: SEM images of samples.**

**Table 1**

	Temperature ( $^{\circ}\text{C}$ )	Lattice Constants (A.U.)	X-ray density ( $\text{gm}/\text{cm}^3$ )	Bond length ( $\text{A}^{\circ}$ )		Ionic radii	
				A-O	B-O	$R_A$ ( $\text{A}^{\circ}$ )	$R_B$ ( $\text{A}^{\circ}$ )
$x=0.6$ ( $\text{Mg}_{0.1}\text{Ni}_{0.6}\text{Zn}_{0.3}$ )	800	7.9134 67	6.243603	1.7133 16	1.9783 67	0.19331 6	0.458367
	1000	8.2351 79	5.540085	1.7829 69	2.0587 95	0.26296 9	0.538795

**Table 2: Data about the FTIR absorption bands positions ( $\nu_1, \nu_2$ )**

$x=0.6$ ( $\text{Mg}_{0.1}\text{Ni}_{0.6}\text{Zn}_{0.3}$ )	Temperature ( $^{\circ}\text{C}$ )	$\nu_1$ ( $\text{cm}^{-1}$ )	$\nu_2$ ( $\text{cm}^{-1}$ )
	800	575	418
	1000	587	427



**Table 3**

x=0.6 (Mg <sub>0.1</sub> Ni <sub>0.6</sub> Zn <sub>0.3</sub> )	Temperature (°C)	Saturation magnetization M <sub>s</sub> (emu/gm)	Coercivity H <sub>c</sub> (Oe)	Band Gap (eV)
	800	057.7455	105.6947	1.61
	1000	091.2250	071.2521	1.52

**6. Conclusion:-** The Mg<sub>0.7-x</sub>Ni<sub>x</sub>Zn<sub>0.3</sub> (Where x=0.6) nano ferrite system was synthesized using the sol-gel method. As the sintering temperature increases, the structural, magnetic, and optical properties of ferrites with the composition Mg<sub>0.7-x</sub>Ni<sub>x</sub>Zn<sub>0.3</sub> (Where x=0.6) changes significantly.

**Conflicts of Interest:** The authors declare that they have no conflicts of interest.

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## Study of the Taguchi Method for the Optimization of Variables for Vertical Axis Wind Turbine

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**ABSTRACT:-** Optimization of process parameter is done to have great control over quality, productivity and cost aspects of the process. Off-line quality control is considered to be an effective approach to improve product quality at a relatively low cost. Analysis of variance (ANOVA) is used to study the effect of process parameter on the machining process. The approach is based on Taguchi method, the signal to noise (S/N) ratio and the ANOVA are employed to study the performance characteristics [1]. Process optimization is the discipline of adjusting a process to optimize some specified set of parameters without violating some constraints. The most common goals are minimizing cost, maximizing throughput and/or efficiency. This is one of the major quantitative tools in industrial decision making. When optimizing a process, the goal is to maximize one or more of the process specifications, while keeping all others within their constraints [2]. Process optimization tools may relate process optimization directly to use of statistical techniques to identify the optimum solution.

**Keywords:-** Taguchi, ANOVA, DOE, Optimization, Static & Dynamic.

**1.INTRODUCTION:-** Taguchi methods are statistical methods developed by Genichi Taguchi to improve the quality of manufactured goods and more recently applied in engineering, biotechnology, marketing and advertising. Professional statisticians have welcomed the goals and improvements brought about by Taguchi methods, particularly Taguchi's development of designs for studying variation. After World War II, the Japanese manufacturers were struggling to survive with very limited resources [3]. If it were not for the advancements of Taguchi the country might not have stayed afloat let alone flourish as it has. Taguchi revolutionized the manufacturing process in the Japan through cost savings. He understood, like many other engineers, that all manufacturing processes are affected by outside influences, noise. However, Taguchi realized methods of identifying those noise sources, which have the greatest effects on product variability. His ideas have been adopted by successful manufacturers around the globe because of their results in creating superior production process at much lower costs. The enemy of mass production is variability. Success in reducing it will invariably simplify processes; reduce scrap, and lower costs. The main method is to design robust systems that are reliable under uncontrollable conditions.

Every experimenter has to plan and conduct experiments to obtain enough and relevant data so that he can infer the science behind the observed phenomenon. He can do so by

**1) Trail-and-error approach:** performing a series of experiments each of which give some understanding [4]. This requires making measurements after every experiment so that analysis of observed data will allow him to decide what to do next "which parameters should be varied and how much". Many a times such series does not progress much as negative results may discourage or will not allow a selection of parameters which ought to be changed in next element next experiment. Therefore, such experimentation usually ends well before the number

of experiments reaches a double digit! The data is insufficient to draw any significant conclusions and the main problem (of understanding the science) still remains unsolved.

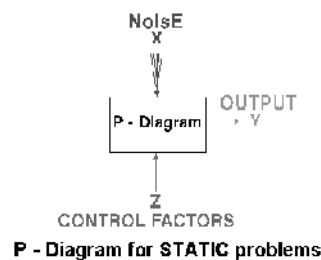
**2) Design of experiments:** - A well planned set of experiments, in which all parameters of interest are varied over a specified range is a much better approach to obtain systematic data. Mathematically speaking, such a complete set of experiments ought to give desired results. Usually the number of experiments and resources (material and time) required are prohibitively large. Often the experimenter decides to perform a subset of the complete set of experiments to save on time and money! However, it does not easily lend itself to understanding of science behind the phenomenon. The analysis is not very easy (though it may be easy for the mathematician/statistician) and thus effects of various parameters on the observed data are not readily apparent. In many cases, particularly those in which some optimization is required, the method does not point to the BEST settings of parameters. A classic example illustrating the drawback of design of experiments is found in the planning of the world cup event, say football. While all matches are well arranged with respect to the different teams and the different venues on different strategy is not desirable for conducting scientific experiments (except for coordinating various institutions, committees, people, equipment, materials etc).

**3) TAGUCHI Method:** Dr Taguchi of Nippon Telephones and telegraph company, Japan has developed a method based on “orthogonal array” experiments which gives much reduced “variance” for the experiment with “optimum settings” of control parameters [5]. Thus the marriage of Design of Experiments with optimization of control parameters to obtain BEST results is achieved in the Taguchi method. “Orthogonal array”(OA) provide a set of well balanced (minimum) experiments and Dr Taguchi’s Signal-to-Noise ratios(S/N), which are log functions of desired output, serve as objective functions for optimization, help in data analysis and prediction of optimum results.

## 2. Taguchi Method treats optimization problems in two categories,

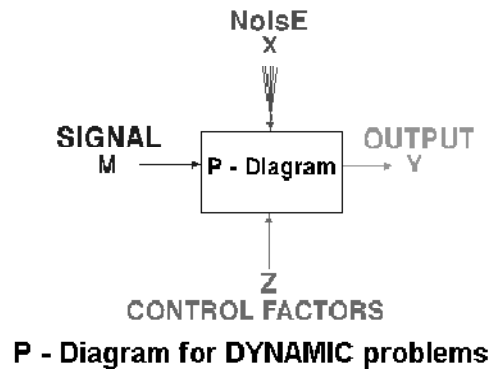
**[A] Static Problems:** -Generally, a process to be optimized has several control factors which directly decide the target or desired value of the output [6]. The optimization then involves determining the best control factor levels so that the output is at the target value. Such a problem is called as a “Static Problems”.

This is best explained using a P -Diagram which is shown below (“P” stands for Process or Product). Noise is shown to be present in the process but should have no effect on the output. This is the primary aim of the Taguchi experiments – to minimize variations in output even though noise is present in the process. The process is then said to have become ROBUST.



**[B] Dynamic Problems:** -If the product to be optimized has a signal input that directly decides the output, the optimization involves determining the best control factor levels so that the “input signal/output” ratio is closest to the desired relationship. Such a problem is called as a “Dynamic Problem”.

This is best explained by a P -Diagram which is shown below. Again, the primary aim of the Taguchi experiments – to minimize variations in output even though noise is present in the process – is achieved by getting improved linearity in the input/output relationship.



### 3. Static Problem (Batch Process Optimization):

There are three Signal-to-noise ratios of common interest for optimization of Static Problems:

**(1) Smaller - the – Better:**

$$n = -10 \text{Log}_{10} [\text{mean of sum of squares of measured data}]$$

This is usually the chosen S/N ratio for all undesirable characteristics like “defects” etc. for which the ideal value is zero [7]. Also, when an ideal value is finite and its maximum or minimum value is defined (like maximum purity is 100% or maximum Tc is 92K or minimum time for making a telephone connection is 1 sec) then the difference between measured data and ideal value is expected to be as small as possible. The generic form of S/N ratio then becomes,

$$n = -10\text{Log}_{10} [\text{mean of sum of squares of \{measured – ideal\}}]$$

**(2) Larger – the – Better:**

$$n = -10\text{Log}_{10} [\text{mean of sum squares of reciprocal of measured data}]$$

This case has been converted to smaller – the – better by taking the reciprocal of measured data and then taking the S/N ratio as in the smaller – the – better case.

**(3) Larger – the – Better:**

$$n = 10\text{Log}_{10} \frac{\text{square of mean}}{\text{variance}}$$

This case arises when a specified value is MOST desired, meaning that neither a smaller nor a larger value is desirable.

Examples are;

- i) Most parts in mechanical fittings have dimensions which are nominal-the-best type.
- ii) Ratios of chemicals or mixtures are normally the best type.  
e.g. Aqua regia 1:3 of HNO<sub>3</sub>:HCL  
Ratio of Sulphur, KNO<sub>3</sub> and Carbon in gun powder
- iii) Thickness should be uniform in deposition/growth/plating/etching.

#### 4. Dynamic Problem (Technology Development):

In dynamic problems, we come across many applications where the output is supposed to follow input signal in a predetermined manner. Generally, a linear relationship between “input” “output” is desirable.

For example: Acceleration peddle in cars,

Volume control in audio amplifiers,

Document copier (with magnification or reduction)

Various types of moldings etc.

There are 2 characteristics of common interest in “follow -the-leader” or “Transformations” type of applications,

- i) Slope of the I/O characteristics and
- ii) Linearity of the I/O characteristics (minimum deviation from the best-fit straight line)

The Signal-to-noise ratio for these 2 characteristics have been defined as;

##### I) Sensitivity {Slope}:

The slope of the input/output characteristics should be at the specified value (usually 1) [8].

It is often treated as larger-the-better when the output is it desirable characteristics (as in the case of sensors, where the slope indicates the sensitivity).

$n = 10 \log_{10} [\text{square of slope or beta of the I/O characteristics}]$

On the other hand, when the output is an undesired characteristics, it can be treated as smaller - the-better.

$n = -10 \log_{10} [\text{square of slope or beta of the input/output characteristics}]$

##### II) Linear (larger-the-better):

Most dynamic characteristics are required to have a direct proportionality between the input and output. These applications are therefore called as “Transformations”. The straight line relationship between input/output must be truly linear. i.e. with as little deviations from the straight line as possible.

$$n = 10 \log_{10} \frac{\text{Square of slope or beta}}{\text{variance}}$$

Variance in this case is the mean of the sum of squares of divisions of measured data points from the best-fit straight line (linear regression).

**5. 8-Steps in Taguchi Methodology:** -Taguchi method is a scientifically disciplined mechanism for evaluating and implementing improvements in products, processes, materials, equipment, and facilities [9]. These improvements are aimed at improving the desired characteristics and simultaneously reducing the number of defects by studying the key variables controlling the processor and optimizing the procedures or design to yield the best results.

The method is applicable over a wide range of engineering fields that includes processes that manufacture raw materials, subsystems, products for professionals and consumer market. In fact, the method can be applied to any process be it engineering fabrication, computer -aided- design, banking and the service sectors etc. Taguchi method is useful for ‘turning’ a given process for ‘best’ results.

Taguchi proposed a standard 8 -steps procedure for applying his method for optimizing any process,

#### **5.1 8-steps in Taguchi Methodology:**

Step 1 identify the main function, side effects, and failure mode [10]

Step 2 identify the noise factors, testing conditions, and quality characteristics

Step 3 identify the objective function to be optimised

Step 4 identify the control factors and their levels

Step 5 select the orthogonal array Matrix experiment

Step 6 conduct the matrix experiment

Step 7 analyze the data, predict the optimum levels and performance

Step 8 perform the verification experiment and plan the future action

**6. CONCLUSIONS :-**Above study gives good information about Taguchi method, which is applied in VAWT system’s variable optimization. Hence, the different type of problems which can be solved with this method is studied; different application and steps to apply Taguchi Method etc are studied in this study. Taguchi method divides all problems into 2 categories – Static or Dynamic. While the Dynamic problems have a signal factor, the optimization is achieved by using 3 signal -to-Noise ratios smaller -the -better, Larger -the -better and nominal -the -best. In Dynamic problems, the optimization is achieved by using 2 signal -to-noise ratios -slope and linearity.

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## A Comprehensive Study of Performance Improvement for Vertical Axis Wind Turbine

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**ABSTRACT:-**The vertical axis wind turbine (VAWT) is an important device to use renewable energy & support existing power generating system. So blade design becomes the important factor to extract energy more efficiently. This paper attempts to give an idea about the progresses made till now in this regard. Savonius, H-rotor Darrieus & LENZ type VAWT will be mainly focussed. For Savonius turbine performance analysis, optimization & positive interactions study will be carried out. For H-rotor type turbine steady wind, low wind speed performance study will be carried out. For LENZ type VAWT experimental data will be obtained in study for open environmental condition. Methods to improve the energy concentration for renewable energy, modeling development, effect of turbulent wind speed on small wind turbine. Performance improvement possibility search in multi-storey wind turbine to stand-alone wind turbine. Experimental study to numerical simulation result analysis study will be done on different type and different sized wind turbine. Different type of wind enclosure will be studied which is capable to increase the performance of wind turbine.

**Keywords:-** VAWT, HAWT, Savonius, H-rotor, LENZ.

**1. INTRODUCTION :-**Renewable energy has become the one of the source to reduce the greenhouse gases and generate electricity at cheapest cost. The wind is the most important sustainable and clean energy sources due to its abundant availability utilized over years. In the past several decades, horizontal axis wind turbines (HAWT) have played an important role in conversion of wind energy to electricity. In order to achieve higher efficiency ratio, great efforts have been made on the improvement of wind turbine such as maximization of power production, optimization of the wind farm and minimization of the blade mass [1]. VAWT has proved to be potentially dominant in the offshore wind utilization due to its advantage in simpler structure, lower cost and large scale development.

Positive interaction between the two Savonius type wind turbine can improve the performance up to 60% [2].  $P$  is the distance between turbine centers;  $D$  is diameter of the turbine rotation and  $\alpha$  is the incident angle between the line connecting turbines centers and incoming wind direction. This paper was studied for the model preparation of VAWT System for multistage system. It gives an idea about how a physical model can be converted into the numerical model [3]. This paper gives the idea about how the temperature sensitive process works and how this energy can be utilised. In similar fashion wind energy can be concentrated to improve the performance wind turbine [4].

### 2. V-SHAPED BLADE VAWT

This study investigated the aerodynamic performance of VAWT with both the V-shaped and inverted V-shaped blade can improve the performance. The power output with  $\Delta V=0.6c$ , increases by more than 20%. Major positive contribution to the power output is generated within the region  $30^\circ \leq \theta \leq 150^\circ$  and  $180^\circ \leq \theta \leq 340^\circ$ . It reduces torque fluctuation as a result generates

less vibration to the rotor. Optimal V-shaped blade greatly reduces drag coefficient in the region  $\Theta = 120^\circ$  to  $\Theta = 205^\circ$  which gives higher lift-drag ratio as compared to straight blade. Where  $\Theta$  is azimuth angle,  $c$  is chord length;  $\Delta V$  is the distance between the leading edge of the V-shaped blade and the leading edge of original straight blade. V-shaped blade has less effect on the thrust coefficient but has great effect on average lateral loads of wind turbine. V-shaped blade does not suffer from dynamic stall due to irregular and complex cross-flow structures as straight blade. Power coefficient mainly attributed by middle section of the V-shaped blade while energy lost by the end section of the blade but not more severe than straight blade. The utilization of V-shaped blade changes the distribution of local low speed region in the turbine wake, which should be taken into consideration in the wind farm scenario [1].

### 3. SAVONIUS-TYPE VAWT

Systematic numerical study was conducted and two Savonius type VAWT were placed in close vicinity to each other for checking the performance and their aerodynamic behaviour [2]. It was found that overall performance increased by positive coupling effect. The upstream turbine can achieve largest power coefficient at  $(P/D, \alpha) = (2.2, 80^\circ)$ , with up to 60% increase over stand-alone turbine. The downstream turbine achieves more power than upstream turbine as well as stand-alone turbine at same coupling parameter. Typical configurations show different torque behaviour and mean flow velocity characterises as shown below.

#### *Savonius wind turbine with Rotor House*

This model uses Rotor House (RH) for micro Savonius wind turbine and tested in the wind tunnel to check the performance improvement [5]. Experimental result and numerical result

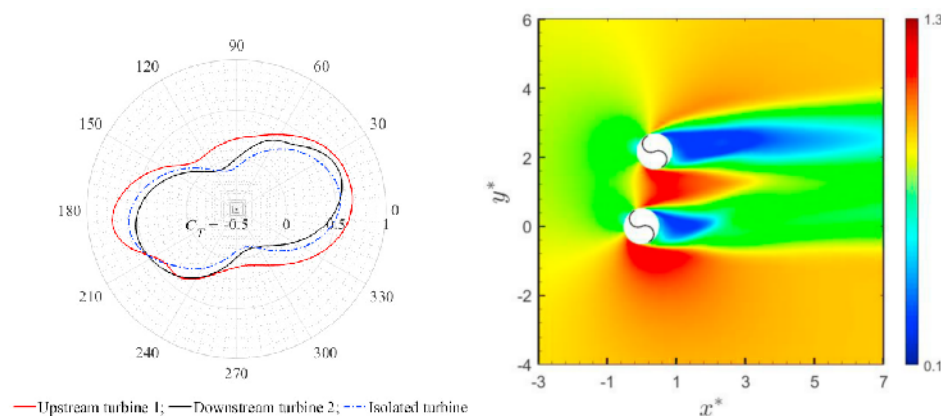


Fig.1. Variations of the torque coefficient ( $C_T$ ) (a) and distributions of mean velocity (b) at  $(P/D, \alpha) = (2.2, 80^\circ)$

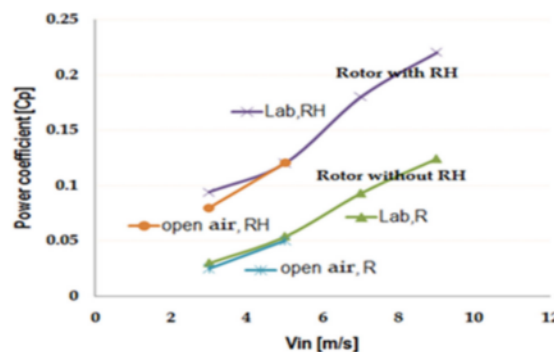


Fig.2. Performance comparison of the conventional rotor with and without RH tested in laboratory conditions and in the field testing

Were found in good agreement for the power generation. 3-bladed Savonius rotors were tested in the laboratory as well as field with and without RH. Experimental result shows that significant improvement in power coefficient from 0.125 -0.218 with power ratio 2.3, check figure 2. The RH was found efficient for all wind directions and all wind speeds. The RH encloses the micro wind turbine hence minimizes the risk of visual impact, safety and bird killing.

The aim of two optimization was to improve the performance of Savonius vertical axis wind turbine (S-VAWT). The optimized blade produces 34% more power without arranging the surrounding area of the rotor [6]. Direction of wind is out of concern for the optimized rotor. Power generation efficiency is improved by 95%. Optimized rotor has good self-starting capability but feasible for only two dimensional CFD simulation.

### Darrieus turbine

Small wind energy systems have a major role in the power production with low wind speed at global level [7]. But during 1980s, when the research on Darrieus turbine was at peak was hindered strongly due to failure of the blade. Aluminium was the material used for the blade manufacturing, which was not able to handle the cyclic load coming to the blade. But later on the development of composite material has solved the problem of blade failure. Now problem of self-starting of Darrieus turbine arisen which was also solved by the research community. Now H-Darrieus turbine has better performance than horizontal axis wind turbine.

CFD Simulation was done to measure the performance of H-Darrieus VAWT for 5KW of power. NACA 0025 blades with straight and cambered surface were used for evaluation. Thereafter, post-processing details were discussed in concerned with torque analysis, lift and drag characterization. It was found that at least 10 complete revolutions was required to reach converged results of transient study of wind flow simulation using  $k-\omega$  shear stress transport (SST) turbulence model. Each blade was monitored individually for the coefficient of lift and drag [8]. Before the performance study 3D model was validated based on 2D model in lieu of experimental validation. Performance curves of both 2D and 3D models shows good agreement. Torque values of cambered and cambered Tubercle Leading Edge (TLE) VAWT vary throughout the rotation of blade. The cambered and cambered TLE blade shows same response up to  $55^\circ$  azimuth but at  $74^\circ$  azimuth shows variation in magnitude, vector of lift and drag forces. At  $106^\circ$  azimuth suppresses the torque to negative ( $-3.59\text{Nm}$ ) as a result of

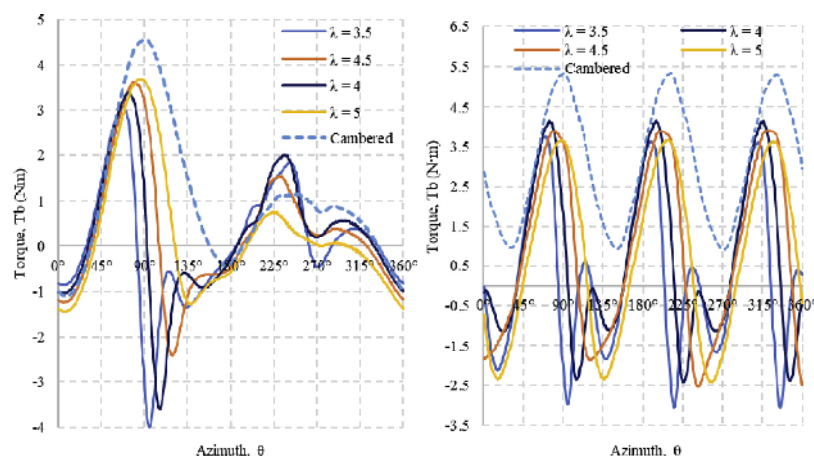


Fig.3. Blade torques ( $T_b$ ) of the cambered TLE VAWT at different TSR settings

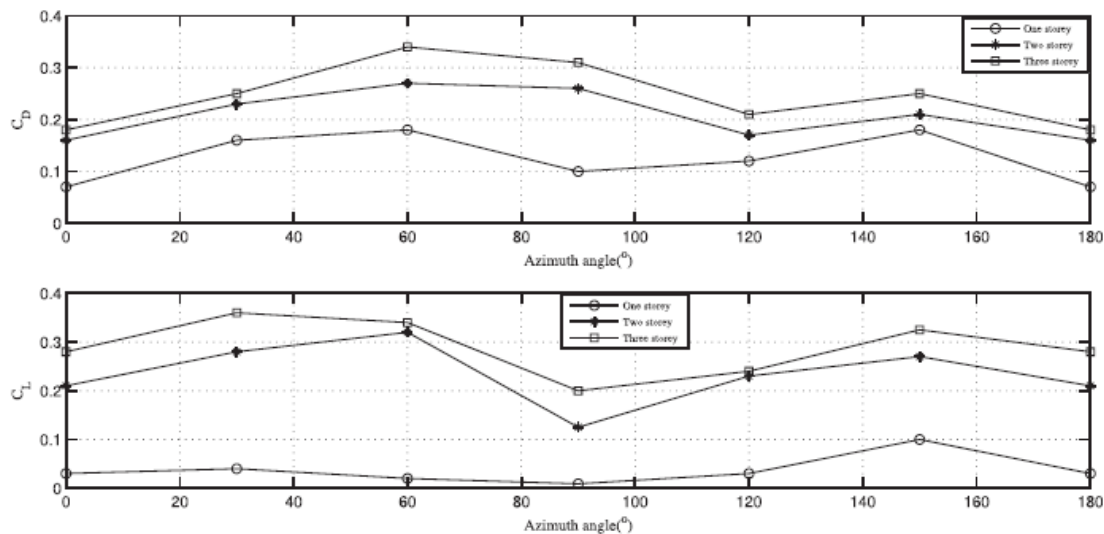


FIG.4. Drag and lift coefficients at various azimuth angles for TSR of 0.44.

reduced lift forces and increased drag forces shown in the figure 3. The drag forces help the blade to overturn. The diminishing effect of TLE on VAWT was up to study only.

#### 4 MULTI-STOREY WIND TURBINE

In this study of performance analysis three different type of VAWT i.e. One storey, two storey and three storey VAWT were tested experimentally and numerically [10]. The effect of number of storey on the power production coefficient, self-starting ability, lift coefficient, drag coefficient on different Tip Speed Ratio (TSR) was compared. Wind tunnel test shows with the increase of number of storey above parameters were improved. For one storey VAWT 7m/s of wind speed was required for starting the rotation of the blade that was reduced to 2-2.6 m/s for three storey VAWT. Three storey configuration of blade is independent of wind direction and vice versa. The experimental and CFD analysis shows the improvement of three storey blade in lift and drag forces, good power performance as compared to the one storey and two storey blade configuration. Numerical result and experimental result are in good agreement with each other as shown in figure 4.

#### 5 MISCELLANEOUS APPROACHES TO IMPROVE THE PERFORMANCE OF VERTICAL AXIS WIND TURBINE

A LENZ [9] type of two stage VAWT has been developed to achieve improved performance of system. This can work in the low speed (2-11 m/s) wind condition. It is applicable for whole Indian continent region. Raw data were obtained from the field trails of LENZ type VAWT. A stand-alone VAWT system was developed to monitor the system's performance without using sensor [11]. For numerical analysis dynamic simulation of model was used. Response speed analysis of the performance deteriorated rotor were analysed for the load torque level for constant tip-speed ratio operation without using any anemometer. The result obtained by the numerical analysis are summarised below:

- Wind turbine performance shifted from positive slope to negative slope when torque coefficient is the function of the TSR for system deteriorating by decreasing the load torque level for constant TSR ratio operation.
- This curve shift for the torque coefficient improves the response speed of rotor with deteriorated wind turbine performance. This is evaluated for response speed by dimensionless parameter that is calculated from estimated wind speed and rotational speed.
- By the difference of dimensionless parameter the performance of turbine can be obtained.
- Deterioration in wind turbine performance can be obtained by performance monitoring method where torque coefficient curve is function of TSR at system operating point.

The implementation of above method will certainly monitor the performance of the stand-alone VAWT and reduces the cost of the system.

Power augmentation device is used to obtain the more power from the VAWT by increasing the velocity of blowing wind [12]. As we know the power output of turbine is the proportional to the cubic power of wind thus slight increase in wind velocity substantially increase the power output. Therefore enclosing the wind turbine with a specifically designed shroud will increase the power output of the turbine. In this study ANFIS method is being presented to test the accuracy estimation for wind turbine rotational speed using power-augmentation-guide-vane (PAGV). Main benefit of ANFIS method is computational efficiency and adaptability. In this study it was estimated that how accurate a wind turbine rotational speed can be measured both with and without the presence of PAGV. In the ANFIS model three parameters time, wind speed and presence of PAGV were utilised as input for given site. ANFIS model can be used to predict the rotational wind speed of turbine with high reliability. ANFIS with PAGV shows better accuracy. Therefore ANFIS Model with PAGV can be embedded effectively in the future model. Experimental examination was conducted in the closed wind tunnel to know the effect of turbulence intensity on aerodynamic performance of the VAWT [13]. Elliptic wedge generators were used to generate the turbulent inflow in wind tunnel. Double stage Savonius rotors were used for experimental tests and the result of it were compared with numerical model. How the turbulent inflow impacted the turbine blade and ultimately aerodynamic performance was revealed with this study. Summarized findings are as follows:

- Power production by wedge-generated turbulent flow was slightly higher than that produced by uniform flow was obtained by experimental results but above 7m/s of wind speed shows drastic reduction.
- Dual influence of turbulence intensity was found on the small wind turbines. It increases the kinetic energy of wind turbine at low speed and also tends to decrease its efficiency near furling speed.
- Self-starting capability of VAWT was improved by the use of turbulent inflow.

Although turbulent inflow increases performance of VAWT but care must be taken while designing the blade to withstand this aerodynamic load. It is important to note that this study is limited to small-scale wind turbine under turbulent flow conditions. However the flow physics may be transferrable to large scale commercial wind rotor designer too.

**6. CONCLUSIONS:-**Above study has given good idea for the development of new turbine and their performance improvement of VAWT by applying different methods whether it is stand-alone turbine, Multi-storey turbine, Enclosure design for VAWT, positive interaction between turbine, small sized turbine facing linear or turbulent flow of wind, experimental or numerical study etc. Paper has given the idea to develop the numerical model from physical model and how the energy concentration method can help to improve the performance of VAWT.



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## THE ROLE OF ICT IN ECOMMERCE BUSINESS DEVELOPMENT

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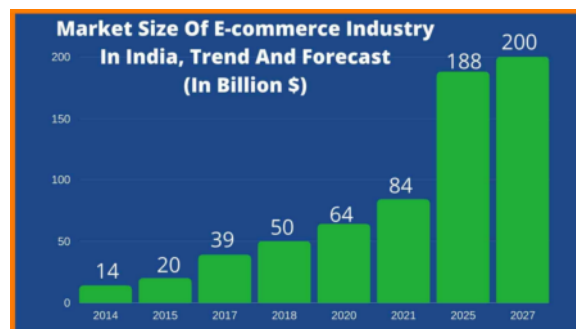
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**ABSTRACT:-**Information technology has the power to develop the industry and transform how business is run. Internet in business is used for information exchange, media promotion, electronic mail, mailing lists, dialogue, discussions, consulting with consumers online. There are two electronic commerce applications, namely: business -to-consumer and business -to-business commerce. Information technology has the power to develop the industry and transform how business is run. The main obstacle in the use of information technology is the enormous cost of making an online network and supplying devices. The use of information technology plays an important role in trade and national economic growth to achieve public welfare.

**Keywords:-** Information Technology, E-Commerce, Role, E-Business, E-Business Transaction.

**INTRODUCTION:-**People's trust are sometimes bridged when information technology which ought to be seen as a medium or a tool for facilitating online transactions and the delivery of online goods and services within the twinkle of an eye is perceived as a conduit for online extortions and manipulations of all sorts via the internet in the name of online transaction of goods and services. Arguably, some factors for this recurring menace could be accompanied to the advent of the Internet and information technology revolution. Before we explore the numerous impact and benefits of information technology on commerce, let's define what information technology and commerce really is. According to Gharegozi et al (2011) Information Technology is the design, creation, utilization, support and management of computer-based information systems in fostering the transactions of information product and services. Better still, Information Technology could be seen as a tool that improves the form of information product and services. The form of information product may include the activities of the information life cycle. Some of these activities are information creation, processing, dissemination, storage and disposal. Essentially, the impact of information technology in developmental sectors in Nigeria could not be overemphasized. Most especially in the area of commerce, where information technology is the wheel or tool that drives the manner and ways in which transactions of goods and services are made in real time. More importantly, information technology has bridge the transportation barrier and physical location of doing business in the 21st century. Taking into cognizance time and space as a resource in doing business. It is imperative to say that information technology has become the pivot on which the operation of commerce rest on. Be that as it may, the commerce is one of the fastest growing industries worldwide, which is as a result of the pivotal role information technology has to play in the commerce industry. At this juncture, commerce could mean the whole system of an economy that constitutes an environment for business. So what is E-commerce? Electronic commerce or E-commerce explains the buying, selling and exchanging of services and information via computer network. In the same way, the term e-commerce gives an overview of how business are being conducted online. We cannot but say that e-commerce has help bridge the geographical boundaries and eliminate the physical traditional market for the transaction of goods and services. As all transactions is online based. More so, E-commerce could be seen as the application of current and emerging information and communication technologies (ICTs) to conduct business. These include existing technologies landline telephone and fax, but the ICTs offering most scope for small businesses are mobile phones, electronic mail and other Internet-

based services. With the emergence of e-commerce, marketplace is extended beyond the traditional physical market and available everywhere: at work, at home, and boundaries is removed; one can carry out business transactions elsewhere via mobile devices, anytime. Geographic location “Marketspace” is created; shopping can take place anywhere. Customer convenience is enhanced, and shopping costs are reduced. This report shall extensively dwell on both the positive and the negative impact of information technology on commerce. Technology continues to be a transformative force and is changing the way individuals live, interact, and work. ICT had changed the approach of doing business globally and the scenario is identical for India and other developing economies. ICT is an umbrella term which involves usage of computers, including hardware, software and networks used to communicate, store and manage the requisite information. The applications of ICT are very diverse and one such area is electronic commerce. Today e-commerce has become an integral part of everyday life. Accessibility to e-commerce platforms is not a Privilege but rather a necessity for most people, particularly in the urban areas. There are alternative e-commerce platforms available for almost every aspect of our lives, starting from purchasing of everyday household items to online shares and commodities. "e-commerce" is defined as the application of information and communication technologies (ICT) which support all the activities and realms of business [Srivastava and Singh, 2013]. The concept of e-commerce has been evolving since a number of years and is causative to the economic growth of several developed and developing economies. Out of the key factors responsible for the growth of e-commerce ICT is a leading one. ICT and e-commerce.



### AIMS AND OBJECTIVES

1. To understand the role of ICT in developing Ecommerce business
2. To examine the positive and negative impact of information technology on commerce
3. To analyse emerging technology trends in e-commerce

**RESEARCH METHODOLOGY:** -The study presents the Role of ICT in developing Ecommerce Business-. The research is completely based on secondary data which is collected through the Published sources, Magazines, Journals, Newspapers, Books and Internet Sources

### LIMITATIONS:

1. The research study has limitation of time.
2. The study is generalized and indicative.
3. The analysed date is limited

### POSITIVE IMPACT OF INFORMATION TECHNOLOGY ON E-COMMERCE

- **Global reach:** E-commerce technology permits commercial transactions to cross cultural and national boundaries far more conveniently and cost-effectively than is true in traditional

commerce. Here the traditional physical market is discarded as a result of a wireless society, which was made evident by the internet. As a result, the potential market size for e-commerce merchants is roughly equal to the size of the world's online population. In other words, information technology has help bridge the physical transportation barrier that would have existed if not for the emergence of information technology in the developmental sector of commerce. At this juncture, we could say that information technology has made it essential for commerce across cultural and across national boundaries, around the earth. National boundaries seamlessly and without modification.

- **Information Density:** The Internet and the Web vastly increase information density that is to say the total amount and quality of information available to all market participants, consumers, and merchants alike. In like manner E-commerce technologies reduce information collection, storage, processing, and communication costs. At the same time, these technologies increase greatly the currency, accuracy, and timeliness of information—making information more useful and important than ever. As a result, information becomes more plentiful, less expensive, and of higher quality.
- **Quicker delivery:** Information technology enables quicker delivery of online products such as software, games, music, which can be downloaded. Quicker delivery is one of the enormous impact of information technology on commerce which makes it imperative for consumers who want to use the product immediately as opposed to waiting longer.
- **Customer satisfaction :** With information technology, consumer can receive more information a product via the internet and make a more informed decision. Greater information leads to more confidence to make a purchase decision. More information also leads to enhanced consumer satisfaction because the consumer has a better idea about how to use the product. More so, information technology enables customization of products so that customers can have a product that suits their exact needs
- **Supply chain efficiencies :** The use of information technology in commerce can lead to a reduction in the inefficiencies relating to supply chain. Some of the benefits are reduced inventories, reduced delivery delay, and efficient e-procurement. Also in the field of commerce, information technology has fosters the collaborative and stronger relationships with suppliers. This include streaming and automating the underlying business process, enabling areas such as direct marketing, selling, customer service (call centres), fulfilment and information management.

#### **NEGATIVE IMPACT OF INFORMATION TECHNOLOGY ON E- COMMERCE**

- **Privacy, security, payment, and contact:** This is the greatest challenge bedeviling online business. Privacy of information, security of that information and payment details whether or not payment details such as credit card detail will be misused, identity theft, contract, and what laws and legal jurisdiction apply, are some of the more serious issues on-line trading. The fact that credit card fraud and identity theft are a reality makes this issue more prominent and pronounced.
- **Delay in the time of delivery of physical products:** When purchases are made in physical stores, the customer gains possession of the product immediately on purchase. This is not possible over the internet. There are ways to get around the problem by substituting products such as books and CDs into downloadable e-books and files. However this cannot be done with every product.
- **Uncertainty of product delivery:** One of the implications of information technology on the customer view point is trust of the delivery of physical product. Nevertheless, in some

ecommerce purchases are made on trust. This is because, firstly, customer not having had physical access to the product, a purchase is made on an expectation of what that product is and its condition. Secondly, because supplying business can be conducted across the globe, it can be uncertain whether or not they are legitimate businesses and are not just going to take your money. Thirdly, even if the item is sent, it is easy to start wondering whether or not it will ever arrived.

## **EMERGING TECHNOLOGY TRENDS IN E-COMMERCE**

### **1. Ubiquitous e-commerce and 24/7 sales**

Mobile devices have changed the way we live in radical ways, contributing to every aspect of our daily existence, becoming an integral tool for day-to-day living. According to trade analysts, 90% of all people keep their mobile phone within reach at all times. And as mobile penetration increases, along with better quality services, this trend is assured to grow.

In 2016, companies such as German online retailer Zalando had 90% of sales via its mobile app, while UK's Shop Direct achieved 62% of total sales on the mobile platform. This trend is leading to the launch of new e-commerce apps, as e-tailers are encouraging their customers to shop via mobile-based apps. Not only does the mobile strategy give e-tailers a direct sales channel between the e-tailer and the customer, but it also acts as a branding tool that is perennially close to the customer.

**2. Digital supply chain :-**Ensuring on-time delivery is a key differentiating factor for companies in the e-commerce space. The successful management of extreme market and spiked demand has, therefore, become the new focus area, optimizing the supply chain management process for these companies and playing a critical role in ensuring efficient and faster delivery models.

Technological innovations are also enabling other critical areas of the supply chain, such as:

- Port management (autonomous freight shuttle debuts),
- Inventory management (hack-proof RFID chips),
- Brand protection (invisible digital markers to help fight counterfeit products),
- Warehouse management (robot technology for collaborative automated order picking),
- Infrastructure (deploying drones to inspect bridges), and
- Delivery (using drones to deliver shipments).

**3. AI-powered personalization:-**In today's hyper-commoditized market, where differentiating a business from the likes of giants like Amazon, Alibaba, and Flipkart, is becoming increasingly difficult; e-commerce vendors are focusing on providing a superior customer experience. A means to accomplish this has been to use technology that drives a high degree of personalization, such that each customer is treated as an individual target segment, rather than a part of a generalized mass. Many AI companies are transforming e-commerce by devising unique solutions for e-commerce companies. For e-commerce businesses, AI technology is becoming increasingly important since it holds the potential for dynamic and adaptable targeting, which helps companies get the right pitch, at the right time, to the right customer, on the right platform. For example, the India-based AI company – Artificia, uses visual search and discovery tools to link individual images with a user's interests to recommend products that they are more likely to purchase. Similarly, Infinite Analytics delivers AI-powered personalization solutions by interacting with users through text and voice messages, while also being able to identify and find products based on pictures.

**4. New payment services :-**Convenience is an essential value proposition associated with e-commerce. Faster, efficient and secure payment options have played a big role in driving the unprecedented growth of the e-commerce market in recent years. Payment modes tend to vary



across regions, for instance, the U.S. and Canadian markets are dominated by credit card payments, while the European market is more partial towards debit cards and digital funds transfers. Emerging economies, on the other hand, are still based in cash, however, they too are rapidly moving towards digitization. According to Gartner, 50% of consumers in mature markets will use smart phones or wearable -tech for making mobile payments by 2018. According to Forrester's mobile payments forecast 2016 -2021, mobile payments in the EU -7 are expected to rise at a CAGR of 19% to reach \$148 billion by 2021. Forrester also predicts that in -person mobile payments will become a fast -growing segment, while remote mobile payments will constitute over 65% of mobile payments by 2021. Of late, with the emergence of contactless payment options, such as Apple Pay and Google wallet, security levels have also reached an all -time high. This higher degree of digital security has bestowed customers with a new confidence, especially to those consumers who have been laggards in the online shopping segment due to security concerns. This is further expected to give a boost to cashless payment modes and, in turn, lead to inflating e-commerce sales.

**CONCLUSION:-**It is imperative to note that The impact of information technology has facilitated business transactions of goods and services, taking into consideration the “death of space’ in the field of commerce, transactions can be carried out anytime, anywhere and at any place with the coverage of the internet . However, the essential problem of e -commerce is internet/data privacy which is at risk in a high security environment, threatening the current operation of online transaction of goods.

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## PHYSICAL EDUCATION TEACHING MODE IN THE CLOUD COMPUTING ENVIRONMENT

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### ABSTRACT

With the development of educational informationization in Colleges and universities, cloud computing technology has become the main means of educational informationization in Colleges and universities. The application of educational information technology in college physical education promotes the integration with physical education. It realizes the transformation of physical education teaching mode and physical learning mode in Colleges and universities, gives full play to the greatest advantage of information technology, and provides students with a good education environment and a scientific and effective learning tool. This paper studies the application of physical education in the cloud computing environment. This paper investigates the current situation of College Physical Education in the cloud computing environment, analyzes and summarizes the problems in the process of college physical education teaching, and gives the corresponding countermeasures and suggestions. It can provide theoretical basis and reference for the future application of cloud computing in college physical education. From the point of view of physical education, this paper studies the relationship between education informatization and physical education, explores new physical education teaching mode, improves the use of school physical education informatization, creates a good teaching atmosphere, and promotes the improvement of teaching quality.

**KEYWORDS:-**Cloud Computing, College physical education, Teaching mode, Server, Network Communication

**INTRODUCTION:-**Concept of Cloud Computing Cloud computing is to provide high-speed, fast and effective network services. Along with the increase of Internet configuration services, it provides dynamic and easy to expand and often virtualized resources through the Internet. Cloud computing service means that we store the data in the server of the cloud platform through the network service we use, and realize resource sharing by means of browser browsing, application app, video resource playing, etc. The education platform of physical education cloud is to use cloud computing as the technical support. According to the teaching process and training program of physical education in Colleges and universities, a comprehensive cloud platform of physical education information resources in Colleges and universities is established. It realizes more convenient and effective supervision, management and information feedback of online physical education in Colleges and universities, and realizes the dynamic of health data and physical fitness test of each university State management, according to individual differences, teaching students according to their aptitude.

### CHARACTERISTICS OF CLOUD COMPUTING

The data storage and processing center provided by cloud computing server has high security and reliability. There will be advanced data center for you to save data and manage information. Secondly, cloud computing technology has low requirements for client devices, and data can be shared in real time between resource platforms and applications. Cloud computing technology provides data services through redundancy. In addition, strong economy, edit ability, dynamic

monitoring of computing resources and balance of resource allocation are all the basic characteristics of cloud computing.

## **THE PROBLEMS OF PHYSICAL EDUCATION TEACHING MODE IN COLLEGES AND UNIVERSITIES**

**Teachers and Students Lack the Correct Attitude Cognition to the Physical Education Teaching Mode in the Cloud Computing Environment** The main reason is that the expansion and application of cloud computing and physical education are relatively less, which leads to the fuzzy cognition of the teachers and students of physical education on cloud computing technology. For the bias of the traditional teaching mode, the author thinks that the network teaching lacks classroom communication, the problems cannot be solved in time and the teaching resources are not updated in time. Not familiar with cloud computing technology and devices, as well as the limitations of network speed and learning environment. These are the important reasons why teachers and students are worried about the current teaching situation. **The University Sports Management System is Not Perfect in the Cloud Computing Environment** Through investigation and research; it is found that the current college sports management system includes: training program management, teaching plan management, course selection management, examination and score management, student status management, etc. But the development of teaching evaluation system is not perfect. In cloud platform teaching, the factors that affect students' individual differences include: individual differences in students' abilities, differences in thinking, differences in interests and hobbies, differences in personality and emotions, and many other factors. Behaviorism learning theory focuses on the stimulation of teaching environment to students' learning process and results. Each student has his own unique cognitive style in the process of growing up. Different cognitive styles will affect the learning style of students.

**The Shortage of College Physical Education Teaching Resources in the Cloud Computing Environment Compared with other cultural courses**, the teaching resources of physical education are relatively backward, and there is a structural shortage. First of all, investment is an important factor restricting the construction of resources, and the proportion of software and hardware is not harmonious. These are important problems restricting the construction of network resource platform. Secondly, there is a lack of effective resource content. At present, the resource content mainly includes teachers' independent design, online download, etc., which is lack of systematization and pertinence. In order to directly download and use the online template for teaching, the cloud computing network service application technology can not connect with teachers' professional knowledge and skills, thus affecting the improvement of teaching quality.

**Lack of Emotional Communication in College Teaching Mode under Cloud Computing Environment** The social interaction mode emphasizes the mutual influence brought by the communication between teachers and students, students and students. According to wigowski, teaching is not only the result of teaching, but also the process of teaching. Different ways of interaction between teachers and students in classroom physical education will produce different results on students' psychology, such as teaching language, body language and other communication means. On the one hand, they will explain the professional knowledge of physical education to students and express their views. At the same time, they also care about and listen to students' reflection and requirements on teaching. But the network teaching is only a

one-way knowledge transmission, ignoring the communication between teachers and students in the learning process. Only boring book knowledge, lack of warm emotional exchange.

## **SUMMARY**

The application of college sports management system depends on the cloud computing mode. The cloud service platform of teaching management provides a more favorable guarantee for the development and implementation of teaching activities. Cloud computing technology provides a more convenient teaching method for college physical education. Network physical education is a teaching method with students as the main part and teachers as the auxiliary part. Classroom physical education is the teaching goal, teaching process and organization teaching method are all carried out under the arrangement of teachers, and students are only passive acceptance. The teaching platform is to cultivate students' independent physical education learning mode, such as "inquiry and discovery learning mode", "self study and mutual teaching learning mode", etc. Cloud computing technology provides a convenient and effective two-way feedback channel between teachers and students. Teachers can monitor students' learning progress and homework through the platform. Students can check and make up for deficiencies according to the curriculum resources uploaded by teachers and find their own deficiencies. At the same time, cloud computing provides a network communication platform for communication between teachers and students. After class homework inspection and doubts can be easily solved. It is suitable to change the students' cognition of physical education. On the other hand, we should follow the trend of social development, use the computing and storage functions of cloud service platform and the advantages of information technology to carry out teaching work, so as to achieve the goal of data information sharing and personalized service of resource platform. Promote the development of physical education in Colleges and universities, and create a good physical culture environment.

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## Coupled Inductor Based High Step-Up DC-DC Converter for Fuel Cell System Applications

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**Abstract:** Fuel cell can convert chemical energy of Hydrogen into electricity but with very low output voltage. A high step up dc -dc converter as a front end converter is essential for FC based application whether employed in a distributed generation system or grid connected operation. This paper presents a coupled inductor based high step -up dc-dc converter that can be used for fuel cell based applications. The proposed converter integrates voltage boost cell with the single switch coupled inductor based quadratic boost converter to achieve high voltage gain with low duty ratio and turns ratio with low voltage stress on the active switch. The small voltage stress on power devices facilitates fast switching devices with reduced losses. These features of the proposed converter reduce power losses, size and cost in addition to increased conversion efficiency. The proposed converter's operating principle and steady-state analysis are presented in detail. The proposed converter is simulated using PSpice simulation software to validate the converter operation, theoretical analysis and performance.

**Keywords**– DC-DC converter · Sustainable energy · Coupled inductor · High voltage gain · Low voltage stress

**I – Introduction:** Energy is a key source of economic development since it is a basic ingredient in many industrial and consumer activities. It is one of the most critical inputs for economic growth. Energy not only stimulates economic and social development, but it also enhances people's quality of life. As a result, global well-being and prosperity are closely linked to energy growth. Meeting the growing demand for energy in a safe and environmentally responsible manner is a big challenge. For almost 150 years, fossil fuels such as coal, oil, and natural gas have powered economies. As of 2019, fossil fuels accounted for 84 percent of global primary energy generation [1]. Fossil fuels are formed by carbon-rich remains of animals and plants that decomposed, compressed and heated underground millions of years ago. When fossil fuels are burned to generate energy, the carbon and other greenhouse gases that have been stored in them are released into the atmosphere. More over 8 million people die each year as a result of air pollution caused by fossil fuels, implying that the use of fossil fuels is responsible for one out of every five fatalities globally [2]. It is now critical to accelerate the use of non-fossil fuel clean energy. Hydrogen is considered as another promising alternative to fossil fuel. The energy from the Hydrogen can be extracted with the help of fuel cell (FC). FCs are electrochemical devices that may use hydrogen as a fuel and directly convert its chemical energy into electrical energy while producing only water and heat as by products. The output voltage of the FC is usually very low, unstable and unregulated. As a result, a high step-up dc-dc converter is a must-have accessory for FC-based applications such as micro-grids, distribution generation, DC distribution

systems, backup power, automotive, and aircraft applications where the voltage need is in the range of 380 to 400V DC.

The literature reports various boosting strategies and topologies for step-up dc-dc converters. In the switched capacitor (SC) technique, capacitors are charged in parallel and discharged in series to boost the voltage level [3], [4]. The complex nature of the SC converters due to large number of capacitors used to attain high gain and large current spike makes switched capacitor converters suitable only for small power applications. To enhance the output voltage level, inductors are magnetized in parallel and demagnetized in series in the switched inductor technique [5], [6]. Voltage multiplier circuits (VMCs) aid in achieving significant voltage gain by including a limited number of additional components [7]. VMCs are generally made up of a variety of diode and capacitor combinations to provide a high dc output voltage. Cascading multiple converter modules is another popular approach for improving the voltage gain of a dc-dc converter. The cascade structure may also be coupled with other voltage-boosting methods to further increase voltage gain [8], [9]. Cascaded converters have major downsides such as a high number of components, lower efficiency, and less system reliability. Voltage-boosting techniques based on coupled inductors have been developed during the last two decades to enhance step-up ratio, and currently they have become the most commonly utilized method [10], [11]. The coupled inductor-based boost converter can produce a high voltage boost ratio with two degrees of freedom, namely the turn's ratio of the coupled inductor in addition to the duty ratio. A coupled inductor with a high turn-ratio, on the other hand, necessitates a big volume and low power density. Hence coupled inductor technique is integrated with other boosting techniques to build high step up converter with optimum turn's ratio and duty ratio. This paper presents a single switch high step up dc-dc converter for FC based applications based on coupled inductor and cascading techniques to achieve desirable features of optimum duty ratio, optimum turn's ratio, high voltage gain, high efficiency, low ripple input current and low voltage stress on power devices.

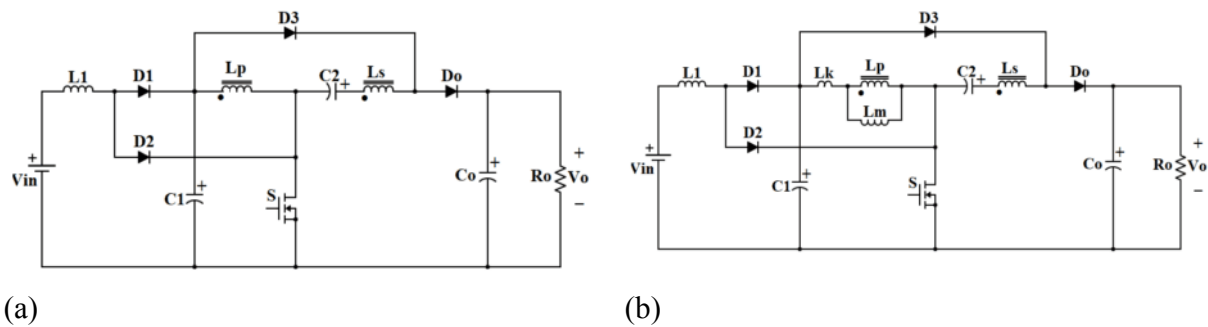
## II – Operating principle of the proposed converter

### A – System configuration

Fig. 1 (a) shows the topology of the proposed high step up converter. This is a single switch two-stage quadratic boost converter with voltage boost cell. The conventional boost converter consisting Inductor  $L_1$ , diodes  $D_1, D_2$  and capacitor  $C_1$  forms the first stage of the proposed converter. The second stage is coupled inductor boost converter with an integrated voltage boost cell. The coupled inductor has two windings primary winding  $L_p$  and secondary winding  $L_s$ . The diode  $D_3$  and capacitor  $C_2$  placed around the coupled inductor form voltage boost cell. The  $D_O$  is output diode and  $C_O$  is output capacitor. The dc voltage source and output voltage are represented by  $V_{in}$  and  $V_O$  respectively.

The proposed converter's equivalent circuit is shown in Fig. 1(b), where the coupled inductor is represented as a combination of a magnetizing inductor  $L_m$ , a leakage inductance  $L_k$ , and an ideal transformer with corresponding turns ratio.

The currents through and voltages across devices are represented as follows:  $L_1: i_{L1}, v_{L1}$ ,  $L_m: i_{Lm}, v_{Lm}$ ,  $L_k: i_{Lk}, v_{Lk}$ ,  $D_1: i_{D1}, v_{D1}$ ,  $D_2: i_{D2}, v_{D2}$ ,  $D_3: i_{D3}, v_{D3}$ ,  $D_O: i_{D_O}, v_{D_O}$ ,  $C_1: i_{C1}, v_{C1}$ ,  $C_2: i_{C2}, v_{C2}$ ,  $C_O: i_{C_O}, v_{C_O}$ , primary and secondary windings of coupled inductor as  $i_1, i_2$  and  $v_{Np}, v_{Ns}$  respectively. The drain-to-source and gate-to-source voltages of MOSFET switch are represented as  $V_{DS}$  and  $V_{GS}$  respectively.



**Fig. 1** (a) The proposed converter (b) Equivalent circuit

Figure 2 depicts some steady -state waveforms of the proposed converter in three operating modes in Continuous Conduction Mode (CCM) during one switching cycle.

### B – Operating Principle

The operating principle of the proposed converter is explained on following assumptions.

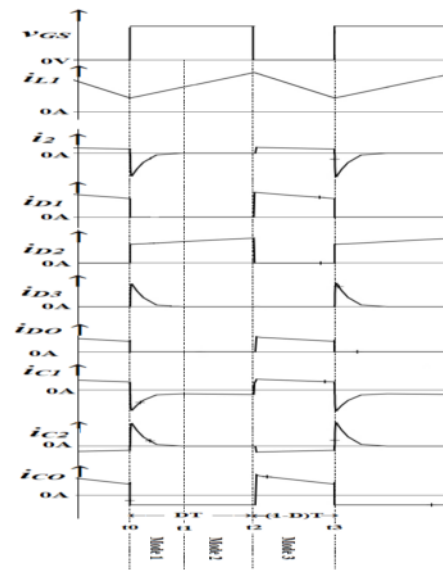
- All components are ideal except the leakage inductance of coupled inductor.
- All capacitors are large enough and the voltages across them are constant.
- The inductor currents  $i_{L1}$  and  $i_{Lm}$  are continuous and always positive.
- The turns ratio of the coupled inductor  $n$  is equal to  $N_s/N_p$ .

**Mode 1 [ $t_0, t_1$ ]:** Switch  $S$  is turned on at time  $t_0$ , which forward biases diodes  $D_2$  and  $D_3$  and reverse biases diodes  $D_1$  and  $D_0$ . Figure 3(a) depicts the current flow path. The input voltage  $V_{in}$  appears across the inductor  $L_1$ , causing the inductor current  $i_{L1}$  to rise linearly. The voltage  $V_{C1}$  appears across the magnetising inductor  $L_m$  and leakage inductance  $L_k$ , causing  $i_{Lm}$  and  $i_{Lk}$  to rise. The energy is therefore stored in inductors  $L_1$ ,  $L_m$ , and  $L_k$ . Simultaneously, a part of the energy stored in capacitor  $C_1$  is transferred to capacitor  $C_2$  through diode  $D_3$ , secondary winding, and switch  $S$ . This increases the capacitor voltage  $V_{C2}$  while decreasing the capacitor current  $i_{C2}$  linearly. At time  $t_1$ , the decreasing capacitor current  $i_{C2}$  becomes zero, therefore turning off diode  $D_3$ . As a result, currents  $i_{C2}$  and  $i_2$  are forced to zero. The load current is supplied by the output capacitor  $C_0$ . This mode will be terminated at time  $t_1$ .

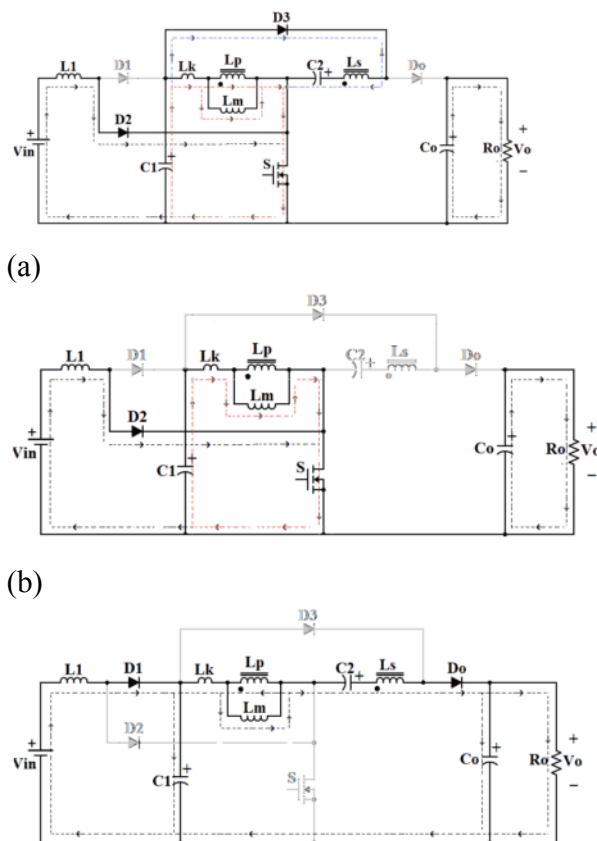
**Mode 2 [ $t_1, t_2$ ]:** During this mode, switch  $S$  and diode  $D_2$  stay turned ON, while diodes  $D_1$ ,  $D_3$ , and  $D_0$  are turned OFF. Figure 3(b) shows the current flow path. The currents  $i_{L1}$ ,  $i_{Lm}$ , and  $i_{Lk}$  continue to rise in a linear fashion. During this mode, the capacitor current  $i_{C2}$  and secondary winding current  $i_2$  are both 0. Input source  $V_{in}$  and capacitor  $C_1$  continue to supply energy to inductors  $L_1$  and  $L_m$  respectively. The output capacitor  $C_0$  continues to supply the load energy. When switch  $S$  is turned OFF at time  $t_2$ , this mode ends.

**Mode 3 [ $t_2, t_3$ ]:** Switch  $S$  is turned OFF at time  $t_2$ , causing diodes  $D_1$  and  $D_0$  to conduct while diodes  $D_2$  and  $D_3$  are reverse biased. Figure 3(c) depicts the current flow path. The voltage  $(V_{in} - V_{C1})$  appears across the inductor  $L_1$ . As  $V_{C1} > V_{in}$ , this voltage is negative. As a result, the inductor current  $i_{L1}$  decreases linearly. Capacitor  $C_1$  receives the energy from input source  $V_{in}$  and inductor  $L_1$ . The series voltages of the input source, inductor  $L_1$ , primary winding,





capacitor  $C_2$ , and secondary winding charge the output capacitor  $C_0$  and also provide the energy to the output load  $R_0$ . This mode ends at time  $t_3$ , after which the switching cycle is repeated.



**(c) Fig. 3** Equivalent circuit and current flow diagrams for various operating modes. (a) Mode 1, (b) Mode 2, (c) Mode 3

**Fig. 2** Typical

wave forms

**III - Steady state analysis of the proposed converter**

In the simplified steady state analysis of the proposed converter the leakage inductance of coupled inductor is neglected.

**Voltage gain**

Following three equations can be obtained by applying KVL to Fig. 3(a)

$$V_{L1(ON)} = V_{in} \tag{1}$$

$$V_{Lm(ON)} = V_{C1} \tag{2}$$

$$V_{C2} = (1 + n)V_{C1} \tag{3}$$

Following two equations can be obtained by applying KVL to Fig. 3(c)

$$V_{L1(OFF)} = V_{in} - V_{C1} \tag{4}$$

$$V_O = V_{C1} + V_{C2} - (1 + n)V_{Lm(OFF)} \tag{5}$$

The voltage gain of the proposed converter can be determined by applying the volt-second balance principle to the inductors  $L_1$  and  $L_m$

$$M = \frac{V_o}{V_{in}} = \frac{2+n-D}{(1-D)^2} \tag{6}$$

**Voltage stresses**

The voltage stresses across the switch S, diodes  $D_2$  and  $D_3$  can be obtained from Fig. 3(c).

$$V_{S(OFF)} = V_{C1} - V_{Lm(OFF)} = \frac{1}{2+n-D} V_o \tag{7}$$

$$V_{D2(OFF)} = V_{Lm(OFF)} = \frac{D}{2+n-D} V_o \tag{8}$$

$$V_{D3(OFF)} = V_{C1} - V_O = \frac{1+n}{2+n-D} V_o \tag{9}$$

The voltage stresses across the diodes  $D_1$  and  $D_O$  can be derived from Fig. 3(a).

$$V_{D1(OFF)} = V_{C1} = \frac{1-D}{2+n-D} V_o \tag{10}$$

$$V_{DO(OFF)} = V_{C1} - V_O = \frac{1+n}{2+n-D} V_o \tag{11}$$

**Performance comparison with other topologies**

The performance characteristics of the proposed converter and other recently published two converters [12] and [13] are compared and presented in Table I. The main parameters taken into account are components count, voltage gain and power device voltage stress. From the comparison it can be observed that the performance parameters of the proposed converter are better than the others due to use of effective voltage boost cell.

**Table 1** Performance comparison with other topologies

Reference	Components# S/L/CL/D/C	Voltage gain	Voltage stress on switch	Voltage stress on output diode
[12]	1/1/1/4/3	$\frac{1+nD}{(1-D)^2}$	$\frac{V_o}{(1+nD)}$	$\frac{(2-D+nD)V_o}{(1+nD)}$
[13]	1/1/1/5/3	$\frac{1+n-D}{(1-D)^2}$	$\frac{(1+n)(1-D)V_o}{1+n-D}$	$\frac{nV_o}{1+n-D}$
<b>Proposed converter</b>	<b>1/1/1/4/3</b>	<b><math>\frac{2+n-D}{(1-D)^2}</math></b>	<b><math>\frac{V_o}{2+n-D}</math></b>	<b><math>\frac{(1+n)V_o}{2+n-D}</math></b>

#Note: S = Switch, L = Inductor, CL = Coupled Inductor, D = Diode, C = Capacitor

The plot of voltage gain vs duty ratio of the proposed converter and the converters reported in [12] and [13] working under the identical conditions: CCM and  $n = 2$  is shown in Fig. 4(a). It is worth noting that the proposed converter produces a larger voltage gain than other converters with the same turns ratio and duty cycle. As a result, the proposed converter can achieve the

desired voltage gain with a lower turns ratio and/or duty cycle, decreasing power losses and increasing conversion efficiency.

The voltage stresses on active switches of these converters, normalized by the output voltage  $V_o$ , at duty cycle  $D = 0.5$  are compared and exhibited in Fig. 4(b). The proposed converter's switch is subjected to less voltage stress than the converters reported in [12] and [13], allowing it to be built with low-voltage MOSFETs with low  $R_{DS\_ON}$ , increasing efficiency while decreasing volume and cost.

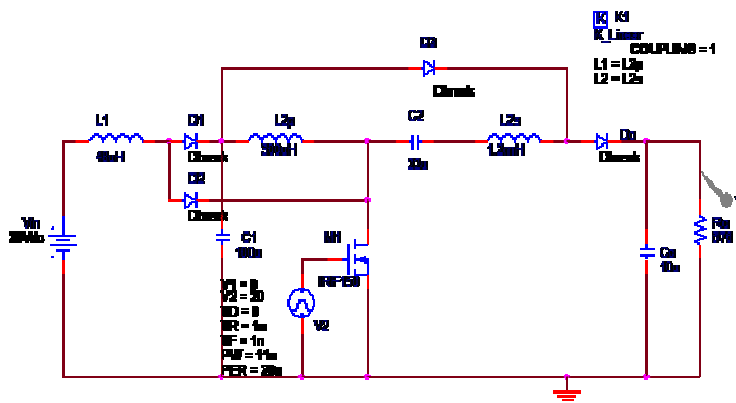
**IV - Results and discussion** :-Simulation with P Spice software is carried out to validate the working principle and the performance of the proposed converter. Figure 5 depicts the simulation circuit diagram.



(a)

(b)

**Fig. 4** Performance comparison with other converters (a) Voltage gain, (b) Switch voltage stress



**Fig. 5:** PSpice simulation circuit diagram of the proposed converter

**Table 2** Component values used for Simulation

Input Voltage $V_{in}$	20V
Output Voltage $V_{out}$	380V
Output Power $P_o$	250W
Switching frequency $f_s$	50 kHz
Inductor $L_1$	48 $\mu$ H
Magnetizing inductor $L_m$	300 $\mu$ H
Turns ratio $n = N_s/N_p$	2
Duty ratio $D$	0.55
Capacitor $C_1$	100 $\mu$ F
Capacitors $C_2$	22 $\mu$ F
Capacitors $C_o$	10 $\mu$ F
Load resistor $R_o$	576 $\Omega$

The component values for the circuit are computed for a 380V output voltage, a 20V input voltage, a 250W output power, and a 50kHz switching frequency. Table 2 shows the component values chosen for simulation, as well as the duty ratio and turns ratio.

A summary of the simulation results is presented in Table 3.

Table 3 Summary of simulation result

Parameter	$V_{in}$	$V_o$	$V_{SW(OFF)}$	$V_{DO(OFF)}$	$V_{D1(OFF)}$	$V_{D2(OFF)}$	$V_{D3(OFF)}$	$V_{C1}$	$V_{C2}$
Simulation Result	20V	380V	112V	335V	41V	66V	335V	44.4V	130V

According to the simulation results, the voltage stress on active switch S is 112V, which is very modest and less than 30% of the output voltage. Because the voltage stress on the switch in the proposed converter is so minimal, it is possible to use a low voltage rated MOSFET with a low on-resistance as a switch, lowering conduction loss and cost. Because of the low voltage stresses on  $D_1$  and  $D_2$ , schottky diodes with a low forward voltage drop can be used to decrease diode power losses while reducing the reverse recovery problem. Although the voltage stresses on diodes  $D_3$  and  $D_0$  are high, they are always less than the output voltage. The right arrangement of diodes and capacitors around the coupled inductor to produce the voltage boost cell results in a high voltage gain of 19 at low turns ratio  $n$  of 2 and low duty ratio  $D$  of 0.55 with low voltage stress of 112V on the switch. The proposed converter's input current is linear and has a minimal ripple. Because the low ripple input current enhances FC stack performance, this is a significant characteristic for converters used in FC-based systems.

**V–Conclusion:**—This paper presents a high voltage gain dc–dc converter based on coupled inductor and cascade techniques. This converter incorporates a voltage boost cell to provide significant voltage gain while maintaining a low duty ratio and turns ratio. The proper arrangement of diodes and capacitors around the coupled inductor to build the voltage boosts cell results in a high voltage gain of 19 at a turn's ratio of 2 and a duty ratio of 0.55. As a result, the suggested converter achieves a very high step-up voltage gain while maintaining a low duty ratio and a low turns ratio. The voltage stress on the switch is significantly decreased and is around 30% of the output voltage. As a result, to enhance efficiency and lower the cost of the converter, a low power rated and low on-resistance MOSFET can be used as an active switch. Because an inductor is directly connected to the input voltage source in the proposed topology, the input current has a small ripple. These desired characteristics make the proposed converter an appealing alternative as front-end converter in FC applications.

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## ADVANCED METHODS FOR OPTIMIZATION OF PLASTIC INJECTION MOULDING PROCESS

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**Abstract:-** Many businesses & researchers have found injection moulding to be a difficult method to use in order to develop goods that satisfy their criteria at a reasonable cost. In the face of global competitiveness in injection moulding business, the trial-and-error method to determine injection moulding process parameters is no longer sufficient. Component design, mould design, machine performance, & processing conditions are four categories of factors that impact moulded part quality. Part & mould designs are believed to be set in stone. Due to drifting or shifting of processing conditions caused by machine wear, environmental change, or operator weariness, quality parameters may diverge throughout production. In plastic injection moulding (PIM) sector, determining appropriate process parameter settings has significant impact on productivity, quality, & cost of production. To establish optimal process parameter settings for PIM, production engineers previously utilized either trial-and-error approach or Taguchi's parameter design method. However, due to rising complexity of product design & necessity of multi-response quality attributes, these approaches are inappropriate in today's PIM. The purpose of this paper is to examine recent research in injection moulding process design & parameter determination. In the realm of injection moulding parameter setting, a lot of research studies based on diverse techniques have been carried out. This article covers mathematical models, Taguchi method, Artificial Neural Networks (ANN), Fuzzy logic, Case Based Reasoning (CBR), Genetic Algorithms (GA), Finite Element Method (FEM), Non Linear Modeling, Response Surface Methodology, Linear Regression Analysis, Grey Rational Analysis, & Principle Component Analysis (PCA). Individual approaches' strengths & weaknesses are explored. It is then followed by findings & considerations of possible research in establishing injection moulding process parameters.

**Key words:-** Genetic Algorithms, Finite Element Method, Non Linear Modeling, Response Surface Methodology, Linear Regression Analysis, Grey Rational Analysis, & Principle Component Analysis.

### Introduction

Many businesses & researchers have found injection moulding to be a difficult method to use in order to make goods that fit their specifications at a reasonable cost. Its complexity, as well as massive quantity of process parameter adjustment that occurs during real-time manufacturing, necessitates significant amount of work to keep process under control. Furthermore, parameter manipulation & complexity can lead to significant quality issues & expensive production costs [2]. Aside from reducing cycle time & lowering manufacturing costs, one of the major aims of injection moulding is to enhance quality of moulded components. For injection moulding firms, resolving quality issues has direct impact on projected profit. Meeting necessary requirements, like many other manufacturing processes, entails maintaining quality attributes under control. Mechanical properties, measurements, or quantifiable qualities, attributes are used to classify quality characteristics in injection moulding. Material related defects, such as black specks &

splay, process related problems, such as filling related defects, such as flash & short shots, packing & cooling related defects, such as sink marks & voids, & post mould related defects, such as war page, dimensional changes, & weight, are all common causes of quality issues. Part design, mould design, machine performance, & processing conditions are four categories of factors that impact quality of moulded parts. Part & mould designs are believed to be set in stone. Due to drifting or shifting of processing conditions caused by machine wear, environmental change, or operator weariness, quality parameters may diverge throughout production. In (PIM) sector, determining optimal process parameter settings has significant impact on productivity, quality, & cost of production. To establish optimal process parameter settings for PIM, production engineers previously utilized either trial-and-error approach or Taguchi's parameter design method. However, due to rising complexity of product design & necessity of multi-response quality attributes, these approaches are inappropriate in today's PIM. In manufacturing business, optimising process parameter issues is commonplace, especially when it comes to determining ultimate ideal process parameters. One of most essential phases in injection moulding for enhancing quality of moulded goods is determining final optimum process parameters (Mok & Kwong, 2002). Previously, engineers utilised trial-and-error procedures to identify initial process parameter values, relying on their expertise & intuition. trial-and-error method, on other hand, is expensive & time-consuming, making it unsuitable for complicated production processes. In face of global competitiveness in injection moulding business, trial-and-error method to determining injection moulding process parameters is no longer sufficient. Several researchers have tried variety of techniques to determining injection moulding process parameters in order to shorten time to market & ensure uniform quality of moulded components. The purpose of this article is to evaluate studies on process parameter determination & mould design for plastic injection moulding. use of cavity pressure signals in research using Taguchi technique, Artificial Neural Networks (ANN), Fuzzy logic, Case Based Reasoning (CBR), Genetic Algorithms (GA), Finite Element Method (FEM), Non Linear Modeling, Response Surface Methodology, Linear Regression Analysis, Grey Rational Analysis, & Principle Component Analysis is discussed.

**Injection Molding Cause & Effect Diagram**

Mold design, process parameters, machine, operator, & material are most common causes of injection moulding defects.

The fish bone graphic shows specifics.

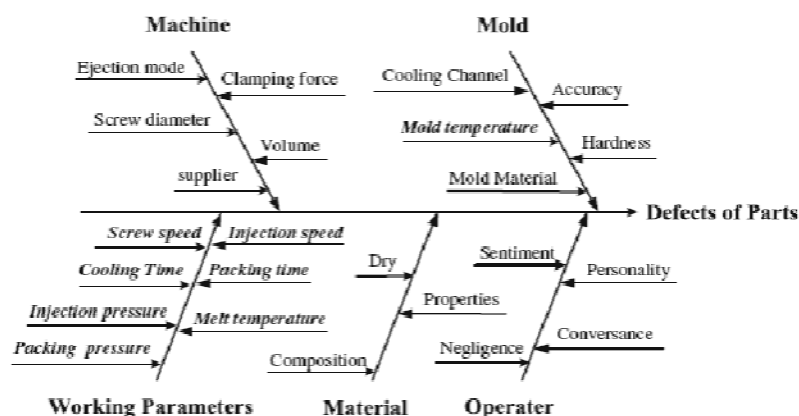


Figure 1: Fishbone schematics of cause-and-effect diagram.



Molding quality is influenced by variety of factors. Retrospective of recent approaches that have been effectively employed for mould design & process parameter design in injection moulding process is presented below.

### 1. Taguchi Method

The Taguchi philosophy is useful technique for developing high-quality production systems. Dr. Genichi Taguchi, Japanese quality management consultant, has devised method based on orthogonal array experiments that results in considerably lower variance for experiment when process control parameters are set optimally. Taguchi technique does this by combining design of experiments (DOE) with parametric process optimization to get desired outcomes. [2]

Traditional experimental design approaches take long time to complete. When number of control factors is large, several experiments are required. Taguchi techniques [7] employ unique orthogonal array architecture to explore whole factor space with limited number of tests. [3]

The Taguchi technique consists of three steps that seek to optimize process or product design:

1. Designing concept or system is first step.
2. Design of Parameters
3. Design for Tolerance

The concept design is considered initial step in design process. This phase gathers technical information & experiences to assist designer in selecting best option for planned product. Optimum control factor setting is established during parameter design. This is arguably most essential stage because it has no bearing on product's unit production cost. Third phase is executed only after parameter design stage has been completed, & it is used when optimized design requires additional enhancements. Trade-off between quality & cost is emphasis of this phase. Designers at this stage, on other hand, are solely concerned with tightening tolerances, upgrading material standards, and, if necessary, modifying components that have major influence on quality through parameter design trials. [8]

In optimum setting analysis, Taguchi technique employs signal-to-noise (S/N) ratio instead of average to translate trial result data into value for characteristic. S/N ratio indicates quality characteristic's average as well as variance. [3]

The following are most often used S/N ratios: best is nominal (NB), lower better (LB), & higher better (HG) (HB). parameter combination with greatest S/N ratio is best setting. [2]

#### Larger — better

The S/N ratio for bigger, better type feature is computed as

$$S/N \text{ ratio } (\eta) = -10 \log_{10} (1/n \sum 1/y_i^2)$$

Where  $i=1$  to  $n$

Where  $n$ = number of replications.

This is used to solve issues when goal is to maximize equality characteristic of interest. larger-is-better issue is referred to as this. smaller, better.

The S/N ratio is computed as follows for smaller better type feature.

$$S/N \text{ ratio } (\eta) = -10 \log_{10} (1/n \sum y_i^2)$$

where  $I$  ranges from 1 to  $n$  This is known as smaller-is-better problem since goal is to reduce size of feature.

The – best – nominal

The optimum type characteristic S/N ratio is determined as S/N for nominal.

$$\text{ratio } (\eta) = -10 \log_{10} (\mu^2/\sigma^2)$$

where  $\mu$  = mean  
 $\sigma$  = departure from mean

This is known as nominal-the-best issue, in which mean squared error around given goal value is minimized. Any way of adjusting mean to target converts issue into restricted optimization problem. [8]

Another important tool in Taguchi design is orthogonal array, which is used to investigate large number of design factors with single answer. Both inner array (control array) & outer array can be found in orthogonal array. Inner array reflects experimenter's control factors, which include number of variables within his or her control. Each inner array experiment is reproduced using outer array, which is different design array based on set of noise factors that researcher either cannot control directly or chooses not to manage. [8]

Many Japanese companies have had considerable success using his ideas.

Thousands of engineers have carried out tens of thousands of tests based on Wu's lectures, according to Wu (1982).

#### Application

Chung-Feng et al. (2006) investigated multiple injection moulding quality improvement for Polyether Ether Ketone (PEEK). Dimensional variation & strength of screws manufactured by injection moulding were investigated in this study. Taguchi technique was used to reduce number of experiments in this study, & grey relational analysis was used to identify best processing parameters for several quality criteria. Outer diameter, tensile strength, & twisting strength of screws were quality features of this experiment. L18 (2<sup>1</sup> 3<sup>7</sup>) orthogonal was used to identify processing factors that might impact injection moulding, such as mould temperature, pre-plasticity amount, injection pressure, injection speed, screw speed, packing pressure, packing time, & cooling time. Grey relational analysis was then used to determine optimal processing settings for numerous quality aspects, as demonstrated by response table & response graph.

The goal of this study was to apply Taguchi technique to create experimental design with fewest numbers of tests possible for PEEK injection moulding process. Taguchi approach, on other hand, was designed to find best processing combination for single quality feature & ignored link between numerous quality characteristics & processing parameters. As result, grey relational analysis was used to overcome Taguchi method's shortcomings & meet goal of multiple quality characteristic optimization. Dimensional deviation of screw's outer diameter was effectively decreased as consequence of optimization of various quality attributes, while tensile strength & twisting strength were optimised in mean time. In addition, PEEK injection moulding quality prediction system was created. RMSE may be reduced to 0.00002 using learning network. These prediction systems predicted & target values were all within 1.5748 percent of each other, demonstrating its accuracy. It also indicates that control elements & their levels, as well as neural network's learning parameters, were carefully designed & selected.

This also indicates experiment findings' repeatability & dependability. Experiments have proved efficacy of this optimization model, & it is compatible with research goal of implementing active waste control measures.

Dong et al (2008) used injection moulding method to evaluate transcription characteristics of cross micro channel.

UV-photolithography & subsequent nickel electroforming techniques were used to manufacture cross micro channel mould insert in current injection moulding tests.

To decrease number of trials, parametric analysis of injection moulding process was carried out by changing critical processing factors such as mould temperature, injection speed, packing pressure, & melt temperature using Taguchi technique. To quantitatively describe transcription characteristics, novel transcription measure, relative error for width & height of micro channel, was proposed. Best & worst processing parameters for injection moulded items were discovered in this study using scanning electron microscope & noncontact 3D confocal microscope. mould temperature was found to be most sensitive processing parameter after sensitivity analysis. Mold temperature, injection speed, packing pressure, & melt temperature, in order of sensitivity, were discovered to be most critical processing parameters. [4].

A unique mould was devised & built by Ziegmann et al. (2009). visualization unit was incorporated into tool to examine growing duration of micro scale weld line during injection moulding. variotherm system (rapid heating/cooling system) was also installed in this micro weld line specimen generating tool due to constraint of fast freezing of polymer melt during micro injection moulding. On horizontal injection moulding machine, tests were carried out. This study used vario thermal mould with visual structure to investigate relationship between weld line strength & processing factors in micro injection moulding for PP material. Taguchi Analysis was used to determine best processing parameters & importance order of processing parameters impacting weld line. four variations prediction formulation for micro injection moulding weld line was then put up using Chebyshev orthogonal polynomial. It was established through confirmation trials that model's prediction errors were less than 21%.

The impact of V notch profile on weld line strength was also investigated. Results revealed that V notch size in middle of specimen is greater & deeper than edge, & surface height in middle is lower than edge. In similar way to macro scale scenario, smaller V notch region results in stronger micro weld line. [13].

## 2. Artificial Neural Networks (ANN)

Artificial neural networks (ANNs) are mathematical models that represent human brain's biological processes. Neurons or processing elements (PE), inter connections, & learning rules are three basic components of ANNs [17].neuron is data-processing component. It receives & analyses incoming signals before sending them on to next level of neurons. Although single neuron might have several inputs, it only has one output. input signals, connection weights, threshold value, & activation functions all influence neuron's output. Inter connectivity is network component that sends impulses in single path from one neuron to others, or even to itself. Learning rules control how weight matrix in network changes. There are two types of learning: supervised & unsupervised. Unsupervised learning depends on local knowledge & internal control inside network, whereas supervised learning employs data set that comprises input vectors & matching output vectors to train network [17].

Back propagation neural networks, radial basis neural networks, single layer & multiple layer networks are all examples of artificial neural networks.

For modelling complicated nonlinear processes, neural networks have been demonstrated to be effective method. Processing speed of neural networks is due to parallel nature of their activities. Neural networks, unlike certain other approaches like nonlinear regression, do not require any priori assumptions about function.

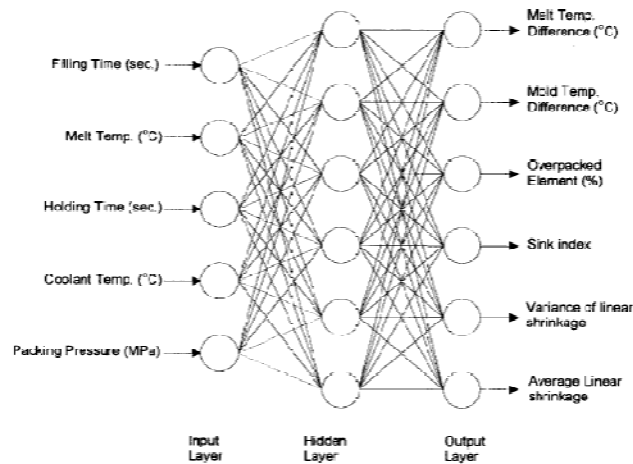


Fig.2- Structure of neural network for quality prediction of molded parts.

### Applications

Ren Shie & colleagues (2008) investigated shape distortions of polypropylene (PP) composite components used in vehicle interiors. Ideal parameter setting for injection moulding process was established by combining trained (RBN) & (SQP) approach. Three computer-controlled progressive strokes were used to prepare specimens under various injection moulding circumstances, changing melting temperatures, injection rates, & injection pressures. Goal of this research was to reduce contour distortions. RBN was trained using sixteen experimental runs based on Taguchi orthogonal array table, & SQP technique was used to find best answer. suggested method performed better than design of experiments (DOE) technique in this investigation. In addition, analysis of variance (ANOVA) was used to find important components that caused specimens' contour aberrations.

To find appropriate configuration for injection moulding process of PP composite components, hybrid approach combining trained RBN & SQP method was created.

To address multi-output restricted optimization issue, this study developed algorithm that combines black-box modelling technique & 7 SQP methods. This algorithm provided simple & systematic method for determining best injection moulding process settings.

As result, efficiency with which ideal parameters are designed is considerably enhanced.

Furthermore, computing load was minimal. With Pentium 4-M 1.7 GHz CPU machine, overall time for training RBN & finding optimal solution was less than 5 minutes, compared to hours of trial-and-error for DOE technique to discover meaningful regression models[9].

Before releasing drawings to real production, Rawin et al. (1997) introduced neural network-based design assistance tool to help designers analyze influence of mould design on mould manufacturability (or mould complexity). To estimate mould complexity in terms of numerical index, suggested method employed 14 input vectors (cost drivers) (scale of 1 - 10). By lowering number of mould design iterations performed by designer, quantitative techniques for mould complexity evaluation aid in enhancing efficiency of product development process. Neural-net model's mould complexity index shows degree of difficulty of mould complexity. In this study, it was anticipated that higher degree of complexity, higher mould production cost.

The relationship (mapping) between mould complexity & mould production cost, on other hand, is not necessarily linear. Part geometry, mould materials, parting line, & number of cavities per

mould are all variables that impact mould complexity. Novel design tool based on artificial neural network (ANN) for evaluating mould complexity was suggested in this study [17].

### 3. Fuzzy logic

Fuzzy logic has a lot of power in terms of capturing human thinking, decision-making, & other elements of cognition. It overcomes constraints of traditional logical systems, which put intrinsic restrictions on representation of imprecise notions, as demonstrated by Kosko (1997). Fuzzy logic can naturally describe ambiguity in coefficients & restrictions. Fuzzy logic modelling provides novel approach to improve cutting conditions & tool selection.

A fuzzy inference engine & fuzzification- defuzzification module are used in Klir's fuzzy logic (1998). input variables are expressed as fuzzy membership values based on various membership functions in fuzzification. On basis of experimental data, governing principles in linguistic form, such as if cutting force is high & machining time is high, then tool wear is high, are established. Inferences about output grade & membership value can be derived based on each rule. To arrive at final conclusion, inferences from multiple rules are merged. To achieve genuine value, membership values are defuzzified using several techniques [1].

### Application

The creation of fuzzy neural network-based in-process mixed material caused flash prediction (FNN-IPMFP) system for injection moulding operations was disclosed by Joseph C. et al.

(2006). When employing recycled mixed polymers in injection moulding processes, objective is to use fuzzy neural network to anticipate flash. Injection speed, melt temperature, & holding pressure of major processing parameters were all adjusted within narrow range. Accelerometer sensor was used to capture real-time vibration signal data during mould closing & injection filling processes. To get flash prediction threshold values under various parameter settings, data was processed using neural networks & fuzzy reasoning techniques in combination with multiple regression models. During injection moulding process, FNN-IPMFP system was demonstrated to anticipate flash with 96.1 percent accuracy. FNN-IPMFP system was made easier to use by combining neural networks & fuzzy reasoning techniques with multiple-regression model.

When important processing factors such as injection speed melt temperature, & holding pressure changed within short range, FNN-IPMFP system provided accurate flash threshold values & effectively anticipated flash. Only two types of plastic materials & one type of injection mould are used in this study. Expanding this method to accommodate new materials & work piece moulds might improve its applicability to future automated machining procedures & industrial application [10].

**4. Genetic Algorithm:-** These are algorithms that are more resilient & more likely to find global optimum since they are based on natural selection mechanics & natural genetics. Because of this characteristic, GA traverses solution space from collection of points rather than single point. To use GA in injection moulding parameter optimization, moulding conditions are represented as genes using binary encoding. Chromosomes are made up of collection of genes that are utilized to carry out fundamental GA mechanisms including crossover & mutation. Crossover is process of exchanging portion of two chromosomes in order to produce new offspring, which is critical for swiftly searching whole search space. After crossover, mutation is used to provide new chromosomes tiny amount of unpredictability. Encoded moulding conditions are decoded from chromosomes & utilized to forecast injection moulding performance metrics to evaluate each person or chromosome. In genetic algorithm, fitness or objective function is function that is used in optimization process & selection of next generation. After number of repetitions, best cutting circumstances are found by comparing values of objective functions across all people. In



addition to weighting factors & restrictions, efficient GA operation necessitates use of appropriate GA parameters. GA optimization approach is based on machining performance prediction models created using comprehensive system of theoretical analysis, experimental databases, & numerical methods. To offer optimal processing conditions, GA optimization approach is enforced with GA parameters, appropriate objective functions, & set of machining performance restrictions [1].

To begin, variables are encoded as n-bit binary integers that are allocated to chromosomal strings in row. Individuals who are not bound are penalized in order to establish restrictions in GA.

When person is no longer constrained, their fitness is set to zero. Individuals with 0 fitness will not become parents since mate selection is based on fitness value. As result, majority of humans in following generation will be guaranteed to live in viable zones restricted by constraints[9].

### Application

For plastic injection moulding process, Y. Q. Zhang et al. (2003) proposed hybrid optimum model combining neural network & genetic algorithm. Mold flow, computer-aided engineering (CAE) programme, is used to model plastic flow. Ideal model is solved using genetic algorithms (GAs), which have strong capacity of obtaining global optimal solution. BPNN was utilised to create approximation analytical model in order to decrease expensive computation coming from numerical simulation.

A soft computing method to optimization of plastic injection moulding process was suggested in this study, which combines GA & NN. Ideal mathematical model was provided in Section 2, which included selection of goal function & design factors. In Section 3, we proposed optimum technique for combining GAs with NN in soft computing paradigm. Section 4 includes case study that demonstrates how suggested technique may be used.

Process operational parameters such as mould temperature, melt temperature, injection time, & injection pressure were studied in this work. Other physical aspects such as design of gating system (type, size, & placement of gate) & geometry of components are not taken into account. Rule-based knowledge system may be implemented into optimization system for plastic injection moulding to increase system's capabilities. Primary problem for future work might be integration of new elements. Optimization technique is effective, as demonstrated by example [18].

By combining fundamental concepts from evolutionary computation, multi objective optimization, & resilient design, For our aghi et al. (2000) proposed novel technique for accomplishing off-line quality control. Tolerance design & parameter optimization are two key quality-related tasks that were handled utilizing genetic algorithm that generates generations of hyper-rectangular design areas while reducing vulnerability of modified designs to uncontrolled changes. Genetic coding system that allows interval computing made it easier to formulate candidate designs as regions rather than standard "point" representation.

By conducting fractional factorial tests on pool of random designs, it was proven how genetic algorithm increases average S/N ratios of entire population of designs from one generation to next. No dominated sorting approach was used to award fitness scores to designs based on no inferiority criteria. Classic genetic operators of reproduction, crossover, & mutation were used to choose fitter designs with better probability of reproducing new offspring. Advantages of employing genetic algorithm over traditional min-max mathematical programming or multi-response extension of Taguchi's method [6] were illustrated by example of multi objective design of I beam.

B. Forouraghi (2002) proposed novel technique based on GAs that covers both mechanical assembly worst-case tolerance analysis & resilient design. GA can rank candidate designs based



on various tolerances around nominal design parameter values using new formulation based on manufacturing capability indices. Product performance metric is next subjected to standard genetic operators to guarantee that it deviates as little as possible from desired target value. Advantages of suggested technique were emphasized by computational findings in design of clutch assembly.

By sampling limited number of points per ellipsoidal design region, suggested technique is able to find effective parallel optimal solutions.

The GA used in this application concentrates its search on ellipsoidal design areas where product's geometric dimensions are within predetermined tolerances. GA aims to breed selectively fitter designs with lower degrees of functional variation among numerous viable candidate designs in such feasible zones. Tight clusters in response region were discovered to correlate to resilient designs, which are those in which product is built to specifications & performs with little sensitivity to uncontrollable parameter fluctuations that may occur during manufacturing or life cycle of part. Current method's utility was shown by examining best clutch assembly design. [7].

### **5. Finite Element Method**

Integrated FEM is used by variety of specializations under mechanical engineering discipline in design & development of their products. FEM shows distribution of stresses & displacements & enables for precise visualization of where structures bend or twist. FEM software offers variety of simulation tools for managing complexity of both system modeling & analysis. To meet most engineering applications, necessary degree of precision & related computing time requirements may be controlled concurrently. FEM enables construction, refinement, & optimization of complete designs before they are produced.

The finite element technique is characterized by processes listed below in general.

- (1) First, grid is selected. Triangles, squares, & curved polygons made up grid.
- (2) Basic functions are then selected. Piecewise linear or piecewise polynomial basis functions are examples of piecewise basis functions.

The smoothness of basic functions is different concern. FEM's advantages include higher accuracy, improved design, & better insight into crucial design parameters, virtual prototyping, fewer hardware prototypes, faster & less expensive design cycle, more productivity, & increased income.

### **Applications**

The study of multi-cavity injection mould was demonstrated by Lee et al. [2006] using finite element & abductive neural network methods. FEM, Taguchi's technique, & abductive network were utilized to find best runner system parameters to reduce warp of injection mould. Abductive neural network was trained using these approaches. This network was utilized to properly forecast warp of multi-injection mould once runner & gate system parameters were determined. Neural network is then subjected to simulated annealing (SA) optimization process using performance index in order to find gate & runner system parameters. When compared to equivalent finite element verification, this approach yields good result.

The FEM simulation mould flow error was compared to model of expected values for optimization procedure. Model not only fits FEM simulation mold flow, but also finite element & abductive network predictions, as seen in this comparison. Accuracy of injection-mould design process may be improved by speed & efficiency of establishing appropriate runner system parameters for injection moulding [14].

## 6. Response surface methodology

The link between multiple explanatory factors & one or more response variables is investigated using response surface methodology (RSM). G. E. P. Box & K. B. Wilson first proposed technique in 1951. fundamental principle of RSM is to get optimal response through series of well prepared trials. To do so, Box & Wilson recommend adopting second-degree polynomial model. They recognize that this model is simply guess, but they adopt it nevertheless since it is simple to estimate & apply, even when nothing is known about process.

Because response surface technique relies on statistical models, practitioners should be mindful that even most accurate statistical model is only rough representation of reality. Both models & parameter values are unknown in practice, & are therefore vulnerable to uncertainty on top of ignorance. Of course, due to estimation mistakes & model deficiencies, predicted optimal location does not have to be optimum in reality. Response surface technique, on other hand, has proven track record of assisting researchers in improving goods & services.

### Application

In terms of injection moulding variables, Mathivanan & N. S. Parthasarathy [2009] constructed non linear mathematical model utilizing response surface approach.

For sink depth prediction, nonlinear model based on central composite design of experiments & flow simulation was effectively constructed. Total of 22 test cases were created at random to validate model. Difference between expected & actual outcomes was determined to be less than 1.4 percent. It demonstrates high agreement as well as created model's predictive ability. Though this study focused on sink mark flaws, developed approach may be applied to other types of faults. Corrective & iterative design procedures may be begun & implemented for product improvement by using this technique while creating products. It may be used by designers as one-of-a-kind set of rules.

The proposed technique will also eliminate production surprises & over-reliance on broad principles & thumb rules. It may also be used on existing items to improve them in future. [15].

## 7. Blackboard-Based Expert System & Case-Based Reasoning Approach:

This expert system has black board with several knowledge sources, as well as control knowledge source & control module. Data used throughout execution cycle is stored on black board. Each knowledge source contains rules for executing certain operations with data from black board. Selection rules for picking among knowledge sources are included in control knowledge source. Execution cycle is performed by control module, which includes eligibility determination phase to identify one or more knowledge sources, knowledge source selection phase to select one of identified knowledge sources using selection rules in said control knowledge source, & action phase to process rule of selected knowledge source.

CBR, in its broadest sense, is process of addressing new issues based on previous answers to comparable problems. Case-based reasoning is used by auto technician who fixes engine by recalling another automobile with comparable symptoms. Similarly, engineer who mimics working parts of nature (biomimicry) is considering nature as library of problem-solving solutions. Common type of analogy creation is case-based reasoning.

Case-based reasoning is four-step procedure that has been formalized:

Retrieve: Retrieve cases from memory that are important to address in target problem.

Reuse: Apply prior case's answer to new situation.

Test new solution in actual world after mapping prior solution to desired circumstance.

Retain: Save resultant experience as new case in memory once solution has been successfully adapted to target problem.

### Application

The computational system for process design (CSPD) for injection moulding was created by C. K. Kwong\* & G. F. Smith [1998]. Blackboard-based expert system & case-based reasoning technique were used to create model. This article goes through chalkboard based expert system for process design (KPC) & case based reasoning system for process design (CBRS), which are two primary components of system. Knowledge sources needed to complete process design in KPC were integrated using blackboard architecture.

CSPD, computer system for injection moulding process design, was created using blackboard-based expert system & case-based reasoning methodology. This article goes through blackboard based expert system for process design (KPC) & case based reasoning system for process design (CBRS), which are two primary components of system. Knowledge sources needed to complete process design in KPC were integrated using blackboard architecture. Architecture was designed to provide good foundation for arranging heterogeneous information sources in expert system to help with injection moulding process design. Knowledge sources may be organized in multiple formats & applied utilizing various AI paradigms thanks to architecture. This is feature of collaborative approach to process design, in which each member may have his own problem-solving technique. During design cycle, however, in process design team, there is constantly dispute among team members. Incapacity of blackboard design to allow negotiating activities among information sources is fundamental flaw. Blackboard should get all negotiating problems first, which would complicate control flow for blackboard-based system. Various knowledge sources may not be able to perform cooperative problem solving in blackboard-based system. Problem-solving method may need to work with human specialists at times. It takes more than cosmetic modification to traditional blackboard architecture to achieve this.

The use of CBRS illustrates how incorporating case-based reasoning into process design may help to speed up & simplify process of determining injection moulding parameters. Also, without complex mould flow analysis, probable faults & component quality information may be acquired instantly. Efficacy of CBRS, on other hand, is determined by number of relevant instances saved in case library. Application of CBRS must go through learning curve if stored cases are limited. Another disadvantage of CBRS is lack of pictorial descriptions incorporated in instances, which might impact how examples are presented as well as how reference case is evaluated.

In comparison to existing expert systems for process design, CSPD not only captures & represents heuristic knowledge of injection moulding machine selection, mould base selection, production scheduling, & cost estimation in KPC, but also weak & ill-defined knowledge, such as injection moulding parameter setting & moulded part quality. CSPD's capacity has been proven using example "sample" [12].

**8. Linear regression model:** -One of most commonly used & helpful statistical approaches for tackling optimization issues is linear regression. Linear regression models are highly strong & may make even most intricate connections between variables easier to understand. They aid in explaining link between observed values of one or more independent variables, typically indicated  $x_1, x_2, \dots, x_n$ , & dependent variable, commonly designated  $y$ . Error term, which is included in all regression models to capture causes of error not captured by other variables, is critical component. Estimator is rule or technique for estimating unknown parameter using data that is established prior to data being drawn. Model's parameters must be linear in order to utilize ordinary least squares (OLS) estimator. Linear Regression Method is based on number of

traditional assumptions (LRM). dependent variable (typically abbreviated Y) can be represented as function of collection of independent variables & additive error (or disturbance) term (where function is linear in unknown coefficients or parameters). coefficients are supposed to be constants, but we don't know what they are.

### Application

To compare actual & anticipated data, Prottyusha Das Neogi & Elizabeth A. Cudney (2009) utilized regression analysis. By comparing predictive effectiveness of T-method with Linear Regression Method, this study focuses on assessing their predictive efficiency. Genichi Taguchi's T-method is based on Taguchi System of Quality Engineering's principles, which are utilized to create overall forecast based on signal-to-noise ratio. Needed parameters are computed using this approach in order to provide overall approximation of real value of output for each signal component. Data set is subsequently subjected to linear regression analysis. This analysis produces linear equation that describes how independent variable varies in response to changes independent variables. R-squared value & modified R-squared value are then used to determine relationship's strength. In order to forecast future values, time series analysis is used. T-Method results are then compared to expected values derived from resultant equation. For comparison & to show benefits & limits of each technique, case study of country food self-sufficiency is utilized.

T-method  $R^2$  & adjusted  $R^2$  values are 0.95&0.89, respectively, but linear regression method  $R^2$ &adjusted  $R^2$  values are 0.982&0.962.  $R^2$ -Squared value achieved by using linear regression technique is higher than  $R^2$ -Squared value obtained by using T-method. As result, linear regression method's predictions yield greater correlation in this case study [16].

**9. Grey relational analysis:**-Experimental data, i.e., measurable aspects of quality attributes, are first normalised on scale of zero to one in Grey relational analysis. Grey relational generation is name given to this process. Grey relational coefficient is then generated using normalized experimental data to indicate correlation between desired & actual experimental data. After that, total Grey relational grade is calculated by averaging Grey relational coefficients for chosen replies. Computed Grey relational grade determines overall performance feature of multiple response procedure. This method reduces multiple response process optimization issue to single response optimization problem with overall Grey relational grade objective function. Best parametric combination is then determined, resulting in highest Grey relational grade. Taguchi method[2] may be used to determine best factor setting for optimizing overall Grey relationship grade.

### Application

Chung-Feng et al. (2006) utilized Taguchi technique to focus on PEEK injection moulding process & to create experimental design with fewest numbers of trials possible. Taguchi approach, on other hand, was designed to find best processing combination for single quality feature & ignored link between numerous quality characteristics & processing parameters. As result, grey relational analysis was used to overcome Taguchi method's short comings & meet goal of multiple quality characteristic optimization. Dimensional deviation of injection moulded screw's outer diameter was effectively decreased as consequence of optimization of numerous qualities attributes, while screw's tensile strength & twisting strength were simultaneously maximized. In addition, PEEK injection moulding quality prediction system was created. For optimization of PEEK injection moulding manufacturing parameters, a fore mentioned study coupled grey relational analysis with Taguchi technique. Experiments have demonstrated

efficacy of this optimization model, & it is compatible with study goal of implementing proactive waste control measures.

Chung-Feng et al. used grey relational analysis to find best processing settings for variety of quality attributes. Reference sequence was created using goal value of hexagonal screw's outer diameter & maximum mean values of tensile strength & twisting strength of L18 orthogonal array. In response table, differential sequence calculation results, grey relational coefficients, & grades in each experiment in reference sequence & orthogonal array were shown.

The optimal PEEK injection moulding processing conditions for hexagonal screw, according to above analysis' response table & response graph, were mould temperature of 1600C, pre-plasticity of 5 cm, injection pressure of 250 bar, injection speed of 15 cm/sec, screw speed of 25 m/min, packing pressure of 600 bar, packing time of 3 sec, & cooling time of 15 sec.

When only one quality characteristic, screw's outer diameter, was considered, best processing conditions were: mould temperature of 160oC, pre-plasticity of 6 cm, injection pressure of 450 bar, injection speed of 15 cm/sec, screw speed of 25 m/min, packing pressure of 400 bar, packing time of 9 sec, & cooling time of 5 sec [5].

**10. Cavity Pressure Signals & Principal component analysis**

PCA is mathematical method that converts large number of potentially linked variables into smaller number of uncorrelated variables known as principle components. first principal component accounts for as much variety as feasible in data, & each subsequent component accounts for as much variability as possible.

PCA is mathematically defined orthogonal linear transformation that turns data into new coordinate system with largest variance falling on first coordinate (called first principal component), second most significant variation on second coordinate, & so on. In terms of least square terms, PCA is best transforming for given data. Its function may be regarded of as disclosing data's internal structure in way that best explains data's variation.

**Application**

Jin Zhang offers unique pattern recognition application for process fault diagnostics in this article. Mold cavity pressure data from plastic injection moulding process help to monitor & diagnose process. To minimize dimensionality while maintaining features of original signals, principal component analysis is performed to cavity pressure data. Wavelet decomposition of "reduced" signal & multi resolution analysis were used to create process "fingerprints." Artificial neural networks may be used to understand these fingerprints for process status monitoring & problem detection. As new process defects are discovered, diagnostic system may be updated adaptively.

In this work, we show how cavity pressure signals, PCA, & MRA's FWT may be used to fingerprint injection moulding process & create defect diagnosis systems. Once problems have been identified, control variable values may be tweaked to provide uniform cavity pressure profile & consistent part quality. Results demonstrate that this diagnostic method is effective for monitoring, diagnostics, & control of RTR process [11].

Table 1 summary all of above injection moulding procedures, as well as tools used & any comments.

Table 1 summary optimization strategies for plastic injection moulding.

Technique	References	Tools used	Remarks
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Taguchi technique	Chung-Feng Jeffrey Kuo & Te-Li Su (2006)	Design of experiments, Orthogonal arrays, ANOVA	Based on actual experimental work & determination of optimum conditions using statistical tools
Artificial neural networks (ANN)	Jie-Ren Shie (2008)	Combining trained radial basis network (RBN) & sequential quadratic programming (SQP)	Optimal parameter setting of injection molding process was determined.
Fuzzy logic	Jie Zhu · Joseph C. Chen (2006)	Fuzzy interface engine & fuzzification – defuzzification module	Based on model which works on human commonsense reasoning, decision making & other concepts of human cognition
Genetic algorithm	F. Shi, Z. L. Lou, J. G. Lu, Q. Zhang (2003)	ACGI (common gate way interface) program	Based on model developed from theoretical analysis, experimental database and numerical methods
Finite Element Method	K.S. Lee & J.C. Lin [2006]	finite element & abductive neural network methods to analysis of multi cavity injection mould	A simulated annealing (SA) optimization algorithm with performance index is applied to neural network in order to search gate & runner system parameters.
Response surface methodology	D. Mathivanan & N. S. Parthasarathy [2009]	Design expert software (DX6)	Based on injection molding model developed by mathematical & statistical techniques
Blackboard-Based Expert System & Case-Based Reasoning	C. K. Kwong* & G. F. Smith [1998]	computational system for process design (CSPD) for injection moulding	CBRS demonstrates that introduction of case -based reasoning in process design can short entime & simplify process for obtaining setting of injection moulding parameters
Linear regression model	Protyusha DasNeogi, and Elizabeth A. Cudney (2009)	ordinary least squares (OLS) estimator & additive error (or disturbance) term	Output of this analysis is linear equation which defines change of independent variable with respect to changes independent variables.
Grey relational analysis	Chung-Feng Jeffrey Kuo & Te-Li Su (2006)	combined grey relational analysis with Taguchi method	optimal processing conditions of PEEK injection molding for hexagonal screw
Cavity Pressure Signals & Principal component analysis	Jin Zhang & Suraj M. Alexander	Mathematical procedure that transforms number of possibly correlated variables into smaller number of uncorrelated variables	Proposes novel application of pattern recognition for process fault diagnosis. Mold cavity pressure signals from plastic injection molding process facilitate process monitoring & diagnosis

## Conclusion

This article offers review of studies on determining injection moulding process parameters. number of research works using cavity pressure signals have been described, using various approaches such as mathematical models, Taguchi technique, Artificial Neural Networks, Fuzzy logic, Case Based Reasoning, Genetic Algorithms, Finite Element Method, N on Linear



Modeling, Response Surface Methodology, Linear Regression Analysis, Grey Rational Analysis, & Principle Component Analysis. According to review of literature on optimization techniques, there have been successful industrial implementations of design of experiment -based methodologies for optimal process variable settings. Taguchi methods & response surface methodology are resilient design approaches that are frequently employed in businesses to make products/processes insensitive to uncontrolled elements like environmental variables. Taguchi method has ability to save time & money in creation of products & processes, as well as enhance quality. Off-line trials throughout product or process design stage are widely acknowledged to be extremely valuable. To statisticians & quality engineers, reducing quality loss by designing goods & processes to be insensitive to fluctuation in noise factors is revolutionary notion. New methods to determining injection moulding process parameters, such as ANN, GA, & CBR, are developing. According to findings of projected quality of moulded components, trained neural network system can quickly offer set of moulding parameters. Neural network's training & retraining, on other hand, might take lengthy period. System can locally optimize moulding parameters using GA method, even if it has no knowledge of process. In practise, pace of convergence to optimal set of process parameters might be sluggish at times. Without depending significantly on skilled moulding workers, CBR systems may quickly generate set of starting process parameters for injection moulding based on comparable cases.

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## A Study and Overview on Smart Manhole Management System

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**Abstract:-** The main goal for the government of India is to improve the faster development and management of the city through the use of modern technology and smart solutions to have healthy and safe cities that delivers the real -time services. In this paper, we have conducted a systematic literature review in order to investigate proposed manhole management services driven by Internet. We have define the research question, search strategy and selection criteria for manhole management services. This review has discussed the different techniques used for the safe manhole cover management. The paper is categorized by the smart city services to the Waste Management services, they proposed or described. The various ways or techniques that are used to save the lives of the people due to improper manhole covers and how the system will meets the expected function, which is helpful to realize the man agement of manhole covers and promote the construction of urban information platforms, create a harmonious and peaceful living environment are recognized in this paper.

**Keywords** – Manhole, Intelligent Transportation System (ITS), Internet of Things (IoT), RFID, Smart City

**1.Introduction:-**In urban areas, Manholes and Sewer Wells are used for managing flow of rainwater, drainage as well as power cables, telecommunication cables etc. It is a necessary facility in local area for traffic management. Manholes are usually covered with a metal cover to keep away any garbage from dropping into the wells. However, if the cover is broken or removed by someone or caused by some calamity, it may lead to a dangerous situation for the moving vehicles and pedestrians. Therefore, efficient and cost-effective means are very essential to monitor the damage to the lids to prevent potential disasters on the road. Hence, monitoring and detecting the sewer well and manhole covers is very essential in cities especially in smart cities. [1]

With the rapid development of government public facilities, the necessity of manhole covers in varied size, its accurate positioning as well as its timely repair increased to a large extent. In case of any lapses by municipal corporations, it has triggered shocking accident, resulted in huge economic losses, threatened traffic safety and personal safety. Hence, the need to design a security monitoring and management system to get rid of risky situations caused by the faulty manhole covers is felt strongly. [2]

Nowadays Manhole Cover failure is on the rise particularly during heavy rainfall and generally affects the safety, security and economy of the society. This is why the need for a fully automated monitoring system has become very essential. Monitoring of Manhole Covers automatically can be considered as part of the development of Smart Cities. It demands smart manhole covers and also Internet of Things (IoT) for instant communication. So to come out with the proper solution, it is proposed to design the smart manholes which will detect the water floating above the manhole lid as soon as it increases and send a warning message to the

transport department. It is proposed here to make the manhole area immediately noticeable when the lid is not properly placed by creating a mesh of rods exactly over the manhole along with start of a blinking warning red light. The whole effort is to indicate that the manhole is open, and take the diversion as the location is dangerous to the moving cars and pedestrians.

With its large number and wide distribution, manhole cover is an important part of city drainage system. But owing to the complex structure and imperfect function of manhole cover, hundreds of people suffer from all kinds of losses because the manhole cover is broken or missing every year. This system is provided with real-time monitoring, timely alarm, accurate positioning, rapid processing, etc. Therefore, the goal of this paper is to investigate how to design a secure monitoring and managing system to safe guard the lives of pedestrians due to damaged manhole covers.

The literature review will be conducted in order to obtain the solution for the defective manhole covers for threatened traffic safety and personal safety. The paper is organized as follows. The second section provides a review description of various different incidents that have been happened due to the damaged manhole covers. The third section describes the review of smart cities and manhole cover management. The fourth section presents the review of research methodology used for the identification of manhole covers. The result of the review and discussion is presented in section fifth. The final section summarizes the article along with the suggestions for future description.

## 2. Practical incidents

### 2.1. Incident of Dr. Deepak Amrapurkar, Gastroenterologist

Let us understand the disaster caused by unmanaged manholes in heavy rains by Bombay Municipal Corporation. On August 29, 2017, Dr Deepak Amrapurkar, a renowned gastroenterologist from Bombay while returning home on a flooded street fell into an open manhole and could not be saved. Amrapurkar's umbrella got stuck in the mouth of the manhole shown Fig 1, hence could be identified by his family enabling his search along the pipeline. The doctor's body was found in Worli two days later. His colleagues could identify the body recognizing his wristwatch. [3]



Fig 1: Dr. Deepak Amrapurkar drowning in Manhole

### 2.2 Incident of Dinesh Jatholiya

Let us illustrate one more case of Kurla, a man died after he fell into an open manhole at Kurla near Eastern Express Highway. The incident took place late on Friday night, between 12 and 12.30 am on 24<sup>th</sup>, June, 2018 according to the Brihanmumbai Municipal Corporation (BMC) disaster management unit. Local residents said Dinesh Jatholiya, 24, fell into a manhole which was covered by a plastic sheet, while he was out on a stroll. He cried out for help for over an

hour. Eventually, he was pulled out by locals, but it was too late. It is likely that low visibility at night prevented Jatholiya from spotting the open manhole, resulting in his fatal fall. He had been walking on the footpath which is the median between the Eastern Express Highway and a lane to enter Kurla, when he stepped on the plastic sheet spread over the manhole, which was on the footpath, and fell in. [4]



Fig 2: Dinesh Jatholiya falling into Manhole

### 2.3. Incident of Aadiyan Parvez

On June 7, three-year-old Aadiyan Parvez Tamboli had died after he failed to see an open gutter in Cheetah Camp area in Chembur (E) during the rains. [4]

### 2.4. Incident of Pregnant Woman

Here it is one more example, “Pregnant woman falls into manhole, feared dead August 15, 2005”, a seven-month pregnant woman constable of the Chandigarh Police was feared drowned in an uncovered manhole of a sewerage line in Sector 30 adjoining the CSIO along the Dakshin Marg. [5]

Therefore, these are the few incidents reviewed, which have occurred because of faulty manhole covers.

### 3. literature review

**Ravi Kishore Kodali and Siva Ramakrishna P [6]**, the drainage system plays a key role in the development of a city and it is crucial for the community in the urban areas as this reduces the floods by carrying away the water. Improper maintenance of drainage system causes many people to suffer, and the existing drainages are not functioning up to the expected standards. Nowadays most of the cities are adopting underground drainage systems which should be smart. In rainy season the blocking of drainage system causes significant disturbance in normal human life while leading to heavy traffic jam. The selected drainage system operates with connected devices for continuous monitoring and controlling to take necessary actions using sensors and Internet of Things. The drainage problems are related to improper maintenance and design of drainage systems, and these problems intensify during heavy rains. As of now in India smart cities do not have drainage systems equipped with communication technologies like IoT that can hamper threatening situations.

**Tsun-Hua Yang, Sheng-Chi Yang, Hong-Ming Kao<sup>1</sup>, Ming-Chang Wu and Hao-Ming Hsu [7]**, Extreme weather and climate events such as super typhoons and unprecedented recorded high intensity rainfall events have increased in recent years due to climate change which cause loss of life and property. Therefore, efficient strategies and measures for flood mitigation and



prevention are essential. Computer-aided techniques can increase the speed of emergency response and reduce the impacts of a flood. IoT was introduced in 2005 and is mostly applied to supply chain management, environmental monitoring, and other non-stress environments. The author identified that the IoT technology can match the identified information requirements and provide added value to emergency response operations in terms of obtaining efficient cooperation, accurate situational awareness, and complete resource visibility. In addition, the system analyzes all the collected information and forecasts to trigger active actions based on the situation; for example, the system controls the start or stop function of water pumps.

**Yang Liu, Mingyi Du, Changfeng Jing, Yun Bai [8]** The manhole covers are one of the important urban infrastructures, but unfortunately they are stolen frequently. If the uncovered manholes cannot be found timely and processed immediately, it may threaten to the city's normal operation. Because the ownership of the manhole covers is unclear, it is much harder to manage these ownerless manhole owners (OLMCS). Based on the deep analyses of the current management status of the ownerless manhole covers, a supervision network and management system for the ownerless manhole covers in Xicheng district, Beijing was established taking advantages of sensors and 3G transmission technology in this paper. Several fixed RFID base stations were settled in some key supervision points where the manhole covers were lost easily and frequently, and each ownerless manhole cover was fixed a dormant RF card. The condition of the manhole covers was transferred to the supervision center in a timely manner by the GPRS wireless network. This formed an active and intelligent way of supervision and management of the ownerless manhole covers.

**Theodora S. Brisimi, Christos G. Cassandras, Chris Osgood, Ioannis Ch. Paschalidis And Yue Zhang [9]**, discussed about the prototype of smart city. The emerging prototype for a Smart City is one of an urban environment with a new generation of innovative services for transportation, energy distribution, health care, environmental monitoring, business, commerce, emergency response, and social activities. The term "Smart City" is used to capture this overall vision as well as the intellectual content that supports it, which are continuously monitored through various sensors to observe, for instance, air/water quality, traffic conditions, occupancy of parking spaces, the structural health of bridges, roads, buildings, as well as the location and status of city resources including transportation vehicles, police cars, police officers, and municipal workers. The data collected need to be securely communicated (mostly wirelessly) to information processing and control points. These data may be shared and the control points can cooperate to generate good (ideally, optimal) decisions regarding the safe operation of these physical elements (e.g., vehicles guided through the city).

**Marko Mijac, Darko Androcec, Ruben Picek [10]**, conducted a systematic literature review in order to investigate proposed smart city services driven by IoT. As, information and communication technology has been reshaping our society. These effects have been so immense, that it is hard to believe that the advent of personal computers, World Wide Web, smart phones and other enabling technologies has happened in just a few decades. More than ever, we deserve to call ourselves information society.

**Alexandra Georgiana Ioan, Anton Anton [11]**, presented here is introducing an overview of climate changes. In recent years, due to climate changes in many areas of the world, natural phenomena such as floods have cost numerous losses of human life. This is of course a positive development for cities that tends to have a positive impact on human health and society; these



are called “blue-green cities”, by taking into account flood protection measures such as changes in urban waterways depending on the event they are exposed to. Over the next decades, extreme rain events are expected to become even more frequent due to climate changes..

**Akshay Bhalerao<sup>1</sup>, Anima Ghosh, Siddhita Mhatre, Sayalee Vadgaonkar, Pallavi Wajge and Ninad Shinde [12]**, describes a smarter way to monitor fill level of garbage bins as well as manholes, using sensors and informing municipal authorities in time, to prevent them from overflowing. The issue of overflowing garbage bins and manholes has become common in many urban areas in India, the delay in cleaning them by sanitary workers being major reason and causes environmental pollution, which results into health hazards. A smarter solution to this problem needs to be discovered. The integration of computing, sensing and communication devices can be used for effective waste management. The sanitary workers can locate bins and manholes which have reached their limit, using android app.

**Sreenu Ponnada, Srinivas Yarramalle, Madhusudhana Rao T.V [13]**, Recognition of an object is a bare minimum restraint for an individual in order to sort out or classify the type of the object. In particular, while recognizing the staircases and manholes, a prototype of mobility recognition is presented using Feature Vector Identification and Sensor Computed Processor Arduino chips. This prototype provides more sovereignty to the sightless people while walking on the roads and helps to pass through on their own without any backing. This prototype is developed using Arduino kit along with feature detection module and helps the visually challenged in reaching their destinations with ease.

**Gangyong Jia, Guangjie Han, Huanle Rao, Lei Shu [14]**, An intelligent manhole cover management system is one of the most important basic platforms in a smart city to prevent frequent manhole cover accidents. Some systems, such as drainage system, electric power system, network system, and so on, are laid underground in a modern city. However, manhole cover accidents, including vehicles and people falling in the holes, frequently occur as a result of manhole cover displacement, loss, and damage, threatening lives and safety and no way to monitor their status in real time. It is difficult to solve the problem of manhole covers being stolen with no method for monitoring traditional manhole covers and it is easy to carry. Therefore, such thefts constitute not only public property losses, but also an increased risk of uncovered holes.

**Yih Chang, Pei -Chi Ho [15]** Road formation is the basic requirement of modern country. Manholes on the road are the main objects result in uneven surfaces. They are not only the killer of public safety, but also the main cause of national compensation; therefore, it is necessary to implement the underground manhole. However, it is not easy to search for the manhole from underground. Thus, it is essential to develop a set of searching, authentication, and precision positioning technologies. The authors analyzed the pros and cons of metal detection, GPS location and RFID authentication approaches as well as their restrictions, of which the first two can only be used as navigational aids to arrive at the scene. While RFID can help to identify manholes, putting the manhole cover 20 cm below the asphalt concrete (AC) pavement creates more complications. Not only the reading distance is way too long for normal operation, but also the filling through the aquifer, and to avoid metal interference comes from the manholes, traditional RFID reader cannot achieve such purpose. Therefore special design is inevitable. In this paper, the author analysis the RFID spectrum as well as the characteristics of binding RFID tags and metal. And then utilize the environmental characteristics of underground manhole, and

design a special-purpose RFID tag — Ground Tag, in order to propose an integrated solution for searching, authentication and precision positioning of the underground manhole.

#### 4.Result Analysis

- Traditional manhole management did not take technical measures.
- Presently there is no digital data available regarding number of manholes.
- It is time and money consuming in discovering cycles of the damaged covers.
- It's a real-time difficulty to ensure timely maintenance.
- Real time-alerting systems of missing lids do exist but real -time repairing and avoiding the loss of lives and property is not achieved yet.

#### 5.Conclusion and futurescope

The conclusion of the paper is to implement the best Manhole management system which can digitized the manholes and a real-time alerting system can be achieved. The Scope of the system is to monitoring interface will induce the flexibility and perfect functionality to support a variety of hardware platforms. To allow anti -theft for manhole covers could be proposed. This monitoring and management system can be implemented to other cities and other areas. It has a great impact on urban society and the digitization of urban information.

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## MYOCARDIAL INFARCTION

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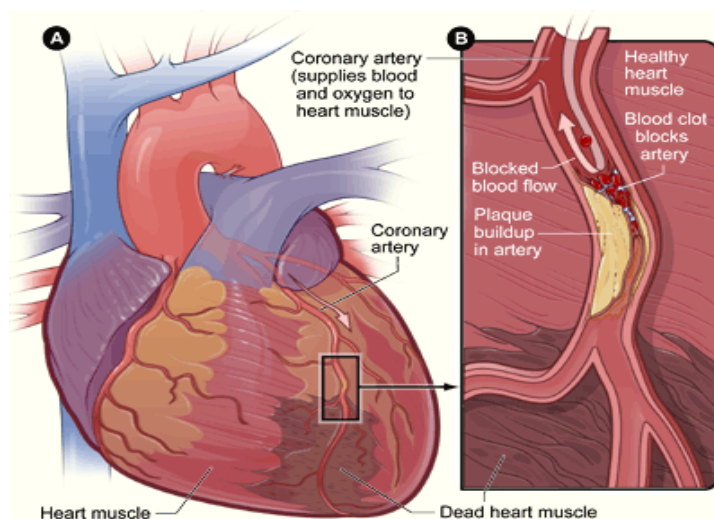
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**ABSTRACT:**-Myocardial infarction (MI), commonly known as a heart attack is the disease of the blood vessels supplying the heart muscle ( Myocardium) i.e. coronary heart disease. The area of heart muscle that has either zero flow or so little flow that it cannot sustain cardiac muscle function is said to be infarcted and the overall process is called a myocardial infarction. MI are of two types; transmural and sub endocardial. Mainly it is caused due to oxidative stress and atherosclerosis. Chest pain is the most common symptom of acute MI and is often described as a sensation of tightness, pressure, or squeezing. Other symptoms include diaphoresis (an excessive form of sweating), Shortness of breath (dyspnea), weakness, light-headedness, nausea, vomiting, and palpitations. The most common symptoms of MI in women include dyspnea, weakness, and fatigue, sleep disturbances. It can be treated by using blockers, diuretics, ACE inhibitors, calcium channel blockers and nitrates.

**KEY WORDS:** - Myocardial Infarction; Atherosclerosis; Transmural; Subendocardial; Oxidative Stress.

**INTRODUCTION:**-Myocardial infarction (MI), commonly known as a heart attack is the disease of the blood vessels supplying the heart muscle ( Myocardium) i.e. coronary heart disease. The area of heart muscle that has either zero flow or so little flow that it cannot sustain cardiac muscle function is said to be infarcted and the overall process is called a myocardial infarction<sup>1</sup>.



**Fig. 1.1:** - Myocardial infarction (Source: web-books.com)

Soon after the onset of the infarction, the area to become overfilled with stagnant blood as a combined effect of collateral blood flow through anastigmatic channel to the infarcted area and progressive dilation of local blood vessels. Simultaneously the muscle fibers use the last vestiges of the oxygen in the blood, causing the hemoglobin to become totally de-oxygenated. Therefore, the infarcted area takes on a bluish-brown. In later stages, the vessel walls become highly permeable and leak fluid; the local muscle tissue becomes edematous, and the cardiac muscle

cells begin to swell because of diminished cellular metabolism. Within a few hours of almost no blood supply, the cardiac muscle cells die. Cardiac muscle requires about 1.3 milliliters of oxygen per 100 grams of muscle tissue per minute just to remain alive.<sup>1</sup>

CLASSIFICATION:

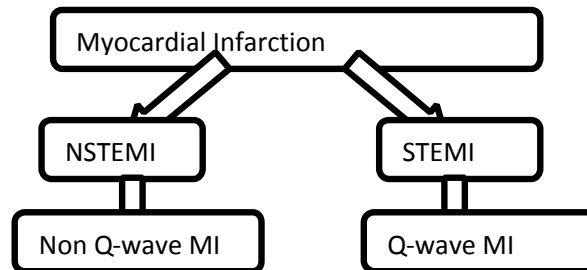


Fig 1.2: Classification of MI.

**There are two basic types of MI:**

**Transmural:** associated with atherosclerosis involving major coronary artery. It can be sub classified into anterior, posterior, or inferior. Transmural infarcts extend through the whole thickness of the heart muscle and are usually a result of complete occlusion of the area's blood supply.

**Subendocardial:** involves small area in the subendocardial wall of the left ventricle, ventricular septum, or papillary muscles. Subendocardial infarcts are thought to be a result of locally decreased blood supply, possibly from a narrowing of the coronary arteries. The Subendocardial area is farthest from the heart's blood supply and is more susceptible to this type of pathology. Clinically, MI is further sub classified into ST elevation MI versus non ST elevation MI based on ECG changes.

### EPIDEMIOLOGY

MI is a common presentation of ischemic heart disease. The WHO estimated that in 2002, 12.6 percent of deaths worldwide were from ischemic heart disease.<sup>2</sup> In the United States, diseases of the heart are the leading cause of death, causing a higher mortality than cancer (malignant neoplasm)<sup>3</sup>. Coronary heart disease is responsible for 1 in 5 deaths in the U.S. This means that roughly every 65 seconds, an American dies of a coronary event.<sup>4</sup>

In India, cardiovascular disease (CVD) is the leading cause of death.<sup>5</sup> The deaths due to CVD in India were 32% of all deaths in 2007 and are expected to rise from 1.17 million in 1990 and 1.59 million in 2000 to 2.03 million in 2010.<sup>6</sup> Although a relatively new epidemic in India, it has quickly become a major health issue with deaths due to CVD expected to double during 1985 - 2015.<sup>7, 8, 9</sup>

### LEGAL IMPLICATION

At common law, MI is generally a disease, but may sometimes be an injury. This has implications for no-fault insurance schemes such as workers' compensation. A heart attack is generally not covered;<sup>10</sup> however, it may be a work-related injury if it results, for example, from unusual emotional stress or unusual exertion.<sup>11</sup> Additionally, in some jurisdictions, heart attacks suffered by persons in particular occupations such as police officers may be classified as line-of-duty injuries by statute or policy. In some countries or states, a person who has suffered from a MI may be prevented from participating in activity that puts other people's lives at risk, for example driving a car or flying an airplane.<sup>12</sup>

CAUSES:

## 1) OXIDATIVE STRESS

Oxidative stress is caused by an imbalance between the production of reactive oxygen and a biological system's ability to readily detoxify the reactive intermediates or easily repair the resulting damage. All forms of life maintain a reducing environment within their cells. This reducing environment is preserved by enzymes that maintain the reduced state through a constant input of metabolic energy. A particularly destructive aspect of oxidative stress is the production of reactive oxygen species (ROS), which include free radicals and peroxides. Disturbances in this normal redox state can cause toxic effects through the production of peroxides and free radicals that damage all components of the cell, including proteins, lipids and DNA. In humans, oxidative stress is involved in many diseases, such as atherosclerosis, MI<sup>13</sup>.

ROS are metabolites of oxygen that can either strip electrons away from other molecules (oxidize), donate electrons to molecules (reduce), or react with and become part of molecules (i.e., oxidative modification). A particularly important radical for cardiovascular biology is superoxide ( $O_2^{\cdot-}$ ), which is formed by the one-electron reduction of oxygen. ( $O_2^{\cdot-}$ ) is important because it can serve as both an oxidant and as a reductant in biologic systems and is a progenitor for other ROS. Endogenous production of free radicals occurs during normal aerobic metabolism. Activated oxygen intermediates are formed by stepwise reduction of  $O_2$  to water and by secondary reactions with protons and transition metals such as Fe and Cu. The superoxide anion ( $O_2^{\cdot-}$ ) is produced by many cell redox systems including ischemia-derived xanthine oxidase, aldehyde oxidase and membrane-associated NADPH oxidases. In addition, phagocytic cells, including macrophages and monocytes, increase their  $O_2$  uptake when stimulated and release large amounts of  $O_2^{\cdot-}$  into the extracellular fluid through the action of NADPH oxidase. Although  $O_2^{\cdot-}$  is not particularly reactive, having a low second-order rate constant with biomolecules, it is capable of diffusing through relatively large distances through the cell where, in the presence of Fe and Cu, a metal-catalysed Haber-Weiss reaction is thought to occur resulting in the formation of the highly reactive hydroxyl radical ( $OH^{\cdot}$ )<sup>14</sup>.

Other radicals include the lipid peroxy ( $LOO^{\cdot}$ ) radical, and alkoxy radicals ( $LO^{\cdot}$ ). Other molecules, including peroxynitrite ( $ONOO^-$ ), hypochlorous acid ( $HOCl$ ), and hydrogen peroxide ( $H_2O_2$ ) are not radicals but have strong oxidant properties and are, therefore, included as ROS<sup>15</sup>. Another relevant group of molecules are the reactive nitrogen species (RNS) including nitric oxide ( $NO$ ), the nitrogen dioxide radical ( $NO_2^{\cdot}$ ), and the nitrosonium cation ( $NO^+$ ). Peroxynitrite is considered both an ROS and RNS and is formed by the near diffusion-limited reaction between  $O_2^{\cdot-}$  and  $NO$ . RNS are important, because they often react with and modify proteins and other cellular structures and alter function of these targets<sup>16,17</sup>.

In addition to ROS-forming enzymes, mammalian cells produce myriad molecules and enzymes that remove ROS. Some of these are small molecules, such as the thiol-containing tripeptide glutathione. Others are enzymes that catalyze removal of ROS, such as the superoxide dismutases (SODs), which catalyze dismutation of  $O_2^{\cdot-}$  to  $H_2O_2$  and water; catalase, which converts  $H_2O_2$  to oxygen and water; the glutathione peroxidases, which use  $H_2O_2$  and glutathione as co-substrates to form water and glutathione disulfide; thioredoxin; and others<sup>18</sup>.

### Sources of reactive oxygen/nitrogen species:

**NAD(P)H oxidases (Nox)**:-The phagocytes, including neutrophils, monocytes, and macrophages, contain a plasma membrane-bound multicomponent oxidase that utilizes NADPH-derived electrons and Activation of the oxidase in phagocytic cells results in large amounts of  $O_2^{\cdot-}$  over short periods that appear to be involved in host defense. NAD(P)H oxidases in vascular cells are subject to activation by specific agonists that include angiotensin II, thrombin, platelet-



derived growth factor, tumor necrosis factor- $\alpha$ , interleukin-, and, for endothelial cells, mechanical forces (including shear stress) and vascular endothelial growth factor<sup>19,20</sup>

**Xanthine oxidase**:-Xanthine oxidase is an iron –sulfur molybdenum flavoprotein with multiple functions that exists in two forms, xanthine dehydrogenase and xanthine oxidase, the former being predominant. The oxidation of xanthine or hypoxanthine to uric acid is associated with NADH production by the dehydrogenase, whereas the oxidase generates  $O_2^{\cdot-}$ . The dehydrogenase is readily converted into the oxidase by proteolysis or by reversible oxidation of thiol groups. Xanthine oxidase contributes to impaired  $\bullet NO$  bioactivity observed with hypercholesterolemia, heavy smoking, and coronary disease<sup>21</sup>.

**Nitric oxide synthases**:-A relative cofactor deficiency for enzyme catalysis allows the enzyme to reduce molecular oxygen rather than transfer electrons to Larginine, thereby generating  $O_2^{\cdot-}$  by the oxygenase domain of the enzyme through dissociation of a ferrous –dioxygen complex that is normally stabilized by tetrahydrobiopterin. In atherosclerosis and diabetes there is evidence that vascular tetrahydrobiopterin levels may be depressed. Nitric oxide may react with metal ions, metalloproteins, and  $O_2^{\cdot-}$  to form reactive nitrogen species. Perhaps the best characterized of these reactions is the combination of NO and  $O_2^{\cdot-}$  to generate ONOO<sup>-</sup>. Among the most abundant biological targets for ONOO<sup>-</sup> is carbon dioxide (CO<sub>2</sub>). The reaction of ONOO<sup>-</sup> with CO<sub>2</sub> is complex and initially produces nitrosoperoxycarbonate which homolyzes to form a pair of caged radicals that may then diffuse apart to become free radicals, or recombine to form nitro carbonate (O<sub>2</sub>NOCO<sub>2</sub>), which decomposes to nitrite and CO<sub>2</sub>. The formation of free nitrogen dioxide (NO<sub>2</sub>) readily leads to protein tyrosine nitration and lipid peroxidation<sup>19, 20, 21</sup>.

**Myeloperoxidase**:-Myeloperoxidase is the only human enzyme that generates HOCl; chlorinated biomolecules are considered specific markers of MPO-mediated oxidation reactions. Myeloperoxidase can yield a number of products, including 3-chlorotyrosine, chlorohydrins from cholesterol and fatty acids, and tyrosyl radicals, with the latter species able to participate in single electron oxidation reactions, including the oxidation of LDL. Another activity of myeloperoxidase and HOCl is to convert L-tyrosine into phydroxyphenylacetaldehyde which can react with amino phospholipids and the  $\epsilon$ -amino groups of protein lysine residues. The product of these reactions may be subsequently modified by myeloperoxidase to generate a variety of reactive aldehyde residues. Furthermore, L-serine is readily converted by myeloperoxidase to Ne-(carboxymethyl) lysine, a well-characterized advanced glycation end-product. Thus, myeloperoxidase and HOCl can generate a series of secondary oxidation products that may oxidize biomolecules, including LDL, rendering them capable of converting macrophages into foam cells<sup>19, 20</sup>.

**Mitochondrial respiration**:-Conventional wisdom dictates that up to 1 –2% of electron flow through the respiratory chain may be diverted to molecular oxygen. Thus; one must consider the mitochondrion as a potential major intracellular source of reactive oxygen species. Mitochondrial oxidant production is controlled, in part, by the expression of a mitochondrial Mn-containing superoxide dismutase located in the mitochondrial matrix<sup>19, 20, and 21</sup>

**2) ATHEROSCLEROSIS**:-Atherosclerosis is the condition in which an artery wall thickens as the result of a buildup of fatty materials such as cholesterol. It is a chronic inflammatory response in the walls of arteries, in large part due to the accumulation of macrophage white blood cells and promoted by low density lipoproteins (plasma proteins that carry cholesterol and triglycerides) without adequate removal of fats and cholesterol from the macrophages by functional high density lipoproteins (HDL). Complications of atherosclerosis are chronic, slowly progressive and cumulative. Most commonly, soft plaque suddenly ruptures causing the

formation of a thrombus that will rapidly slow or stop blood flow, leading to death of the tissues fed by the artery. This catastrophic event is called an infarction. One of the most common recognized scenarios is called coronary thrombosis of a coronary artery, causing MI. Even worse is the same process in an artery to the brain, commonly called stroke<sup>22</sup>.

Atherosclerosis develops from low-density lipoprotein molecules (LDL) becoming oxidized by free radicals, particularly oxygen free radicals (ROS). When oxidized LDL comes in contact with an artery wall, a series of reactions occur to repair the damage to the artery wall caused by oxidized LDL. The LDL molecule is globular shaped with a hollow core to carry cholesterol throughout the body to generate brain tissues, vitamin D, and so on. Cholesterol does not dissolve in water. Cholesterol can move in the blood stream only by being transported by LDL<sup>1, 20</sup>.

The initial damage to the blood vessel wall results in a "call for help," an inflammatory response. Monocytes enter the artery wall from the bloodstream, with platelets adhering to the area of insult. This may be promoted by redox signaling induction of factors such as VCAM-1, which recruit circulating monocytes. The monocytes differentiate macrophages which ingest oxidized LDL, slowly turning into large "foam cells" – so-described because of their changed appearance resulting from the numerous internal cytoplasmic vesicles and resulting high lipid content. Unfortunately, these white blood cells are not able to process the oxidized LDL, and ultimately grow then rupture, depositing a greater amount of oxidized cholesterol into the artery wall. This triggers more white blood cells, continuing the cycle. Eventually, the artery becomes inflamed. The cholesterol plaque causes the muscle cells to enlarge and form a hard cover over the affected area. This hard cover is what causes a narrowing of the artery, reduces the blood flow and increases blood pressure<sup>23</sup>.

**SYMPTOMS OF MI:** -The onset of symptoms in MI is usually gradual, over several minutes, and rarely instantaneous. Chest pain is the most common symptom of acute MI and is often described as a sensation of tightness, pressure, or squeezing. Other symptoms include diaphoresis (an excessive form of sweating), Shortness of breath (dyspnea), weakness, light-headedness, nausea, vomiting, and palpitations. The most common symptoms of MI in women include dyspnea, weakness, and fatigue, sleep disturbances. In women, chest pain may be less predictive of coronary ischemia than in men<sup>24</sup>.

Approximately one fourth of all MI are silent, without chest pain or other symptoms<sup>25</sup>. These cases can be discovered later on electrocardiograms or at autopsy without a prior history of related complaints. A silent course is more common in the elderly, in patients with diabetes mellitus and after heart transplantation, probably because the donor heart is not connected to nerves of the host<sup>26</sup>.

**RISK FACTORS:** -Heart attack rates are higher in association with intense exertion, be it psychological stress or physical exertion, especially if the exertion is more intense than the individual usually performs.<sup>27</sup> Quantitatively, the period of intense exercise and subsequent recovery is associated with about a 6-fold higher MI rate (compared with other more relaxed time frames) for people who are physically very fit.<sup>27</sup> For those in poor physical condition, the rate differential is over 35-fold higher.<sup>27</sup> One observed mechanism for this phenomenon is the increased arterial pulse pressure stretching and relaxation of arteries with each heart beat which, as has been observed with intravascular ultrasound, increases mechanical "shear stress" on atheromas and the likelihood of plaque rupture.<sup>27</sup>

Acute severe infection, such as pneumonia, can trigger MI. A more controversial link is that between *Chlamydia pneumoniae* infection and atherosclerosis.<sup>28</sup> While this intracellular

organism has been demonstrated in atherosclerotic plaques, evidence is inconclusive as to whether it can be considered a causative factor.<sup>28</sup> Treatment with antibiotics in patients with proven atherosclerosis has not demonstrated a decreased risk of heart attacks or other coronary vascular diseases.<sup>29</sup>

There is an association of an increased incidence of a heart attack in the morning hours, more specifically around 9 a.m.<sup>30, 31, 32</sup>. Some investigators have noticed that the ability of platelets to aggregate varies according to a circadian rhythm, although they have not proven causation.<sup>33</sup> Some investigators theorize that this increased incidence may be related to the circadian variation in cortisol production affecting the concentrations of various cytokines and other mediators of inflammation.<sup>34</sup>

Risk factors for atherosclerosis are generally risk factors for MI:

Diabetes (with or without insulin resistance) - the single most important risk factor for ischaemic heart disease (IHD)

Tobacco smoking

Hypercholesterolemia (more accurately hyper lipoproteinemia, especially high LDL and low HDL)

High blood pressure

Family history of IHD

Obesity<sup>35</sup> (defined by a body mass index of more than 30 kg/m<sup>2</sup>, or alternatively by waist circumference or waist-hip ratio).

Age: Men acquire an independent risk factor at age 45, Women acquire an independent risk factor at age 55; in addition individuals acquire another independent risk factor if they have a first-degree male relative (brother, father) who suffered a coronary vascular event at or before age 55. Another independent risk factor is acquired if one has a first-degree female relative (mother, sister) who suffered a coronary vascular event at age 65 or younger.

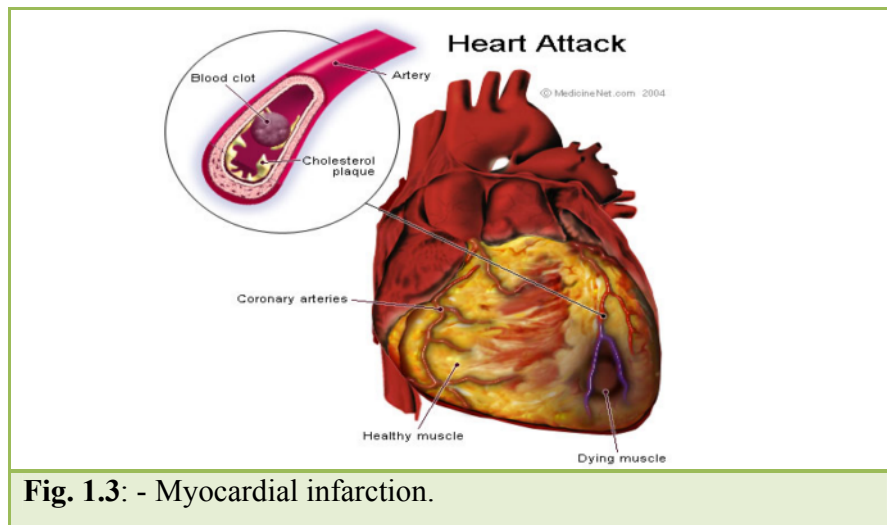
Hyper homocysteinemia (high homocysteine, a toxic blood amino acid that is elevated when intakes of vitamins B2, B6, B12 and folic acid are insufficient)

Stress (occupations with high stress index are known to have susceptibility for atherosclerosis)

Alcohol Studies show that prolonged exposure to high quantities of alcohol can increase the risk of heart attack. Males are more at risk than females.<sup>27</sup>

MECHANISM OF MI:

Fatty acids are the main fuel for the healthy heart, supplying approximately 60-80% of the energy. Myocardial ischemia dramatically alters fuel metabolism<sup>20</sup>. Sudden occlusion of a major branch of a coronary artery shifts aerobic or mitochondrial metabolism to anaerobic glycolysis within seconds. A compensatory increase in anaerobic glycolysis for ATP production leads to the accumulation of hydrogen ions and lactate, resulting in intracellular acidosis and inhibition of residual energy metabolism<sup>36</sup>. Impaired contraction with persistent electrical activity develops in association with alterations in ion transport systems in the sarcolemma and organellar membranes<sup>37</sup>. Reduced aerobic ATP formation stimulates glycolysis and an increase in myocardial glucose uptake and glycogen breakdown. At the same time decreased ATP inhibits Na<sup>+</sup>, K<sup>+</sup>-ATPase, increasing intracellular Na<sup>+</sup> and Cl<sup>-</sup>, leading to cell swelling<sup>38</sup>.



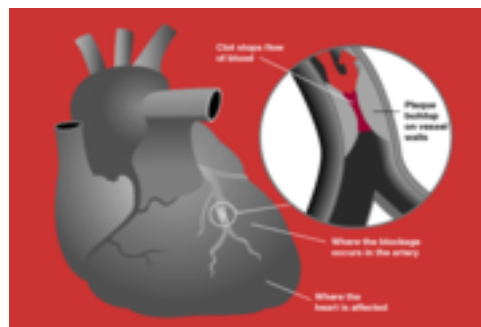
**Fig. 1.3:** - Myocardial infarction.

An early increase in cytosolic  $\text{Ca}^{2+}$  also develops due to multi-factorial changes in transport systems in the sarcolemma and sarcoplasmic reticulum.  $\text{Ca}^{2+}$ -induced activation of proteases causes alterations in contractile proteins, decreased sensitivity to  $\text{Ca}^{2+}$ , and sustained impairment of contractility despite the elevated cytosolic  $\text{Ca}^{2+}$ <sup>39</sup>.

Ultra structurally, reversibly injured myocytes are edematous and swollen from the osmotic overload. The cell size is increased with a decrease in the glycogen content<sup>40</sup>. Increased cytosolic  $\text{Ca}^{2+}$  and mitochondrial impairment cause phospholipase activation and release of lysophospholipids and free fatty acids, which are incorporated within the cell and damaged by peroxidative damage from free radicals and toxic oxygen species<sup>41</sup>.

#### PATHOPHYSIOLOGY:

A MI occurs when an atherosclerotic plaque slowly builds up in the inner lining of a coronary artery and then suddenly ruptures, totally occluding the artery and preventing blood flow downstream.



**Fig; 1.4** the inner lining of a coronary artery

The most common triggering event is the disruption of an atherosclerotic plaque in an epicardial coronary artery, which leads to a clotting cascade, sometimes resulting in total occlusion of the artery. Atherosclerosis is the gradual buildup of cholesterol and fibrous tissue in plaques in the wall of arteries (in this case, the coronary arteries), typically over decades. Blood stream column irregularities visible on angiography reflect artery lumen narrowing as a result of decades of advancing atherosclerosis. Plaques can become unstable, rupture, and additionally promote a thrombus (blood clot) that occludes the artery; this can occur in minutes. When a severe enough

plaque rupture occurs in the coronary vasculature, it leads to MI (necrosis of downstream myocardium).

If impaired blood flow to the heart lasts long enough, it triggers a process called the ischemic cascade; the heart cells in the territory of the occluded coronary artery die (chiefly through necrosis) and do not grow back. A collagen scar forms in its place. Recent studies indicate that another form of cell death called apoptosis also plays a role in the process of tissue damage subsequent to MI<sup>42</sup>. As a result, the patient's heart will be permanently damaged. This Myocardial scarring also puts the patient at risk for potentially life threatening arrhythmias, and may result in the formation of a ventricular aneurysm that can rupture with catastrophic consequences.

Injured heart tissue conducts electrical impulses more slowly than normal heart tissue. The difference in conduction velocity between injured and uninjured tissue can trigger re-entry or a feedback loop that is believed to be the cause of many lethal arrhythmias. The most serious of these arrhythmias is ventricular fibrillation (V-Fib/VF), an extremely fast and chaotic heart rhythm that is the leading cause of sudden cardiac death. Another life threatening arrhythmia is ventricular tachycardia (V-Tach/VT), which may or may not cause sudden cardiac death. However, ventricular tachycardia usually results in rapid heart rates that prevent the heart from pumping blood effectively. Cardiac output and blood pressure may fall to dangerous levels, which can lead to further coronary ischemia and extension of the infarct.

The cardiac defibrillator is a device that was specifically designed to terminate these potentially fatal arrhythmias. The device works by delivering an electrical shock to the patient in order to depolarize a critical mass of the heart muscle, in effect "rebooting" the heart. This therapy is time dependent, and the odds of successful defibrillation decline rapidly after the onset of cardiopulmonary arrest.

DIAGNOSIS:

**Criteria:**

**WHO criteria:** WHO criteria<sup>43</sup> have classically been used to diagnose MI; a patient is diagnosed with MI if two (probable) or three (definite) of the following criteria are satisfied:

Clinical history of ischaemic type chest pain lasting for more than 20 minutes

Changes in serial ECG tracings

Change in serum cardiac biomarkers such as creatine kinase-MB fraction and troponin I.

The WHO criteria were refined in 2000 to give more prominence to cardiac biomarkers<sup>44</sup>.

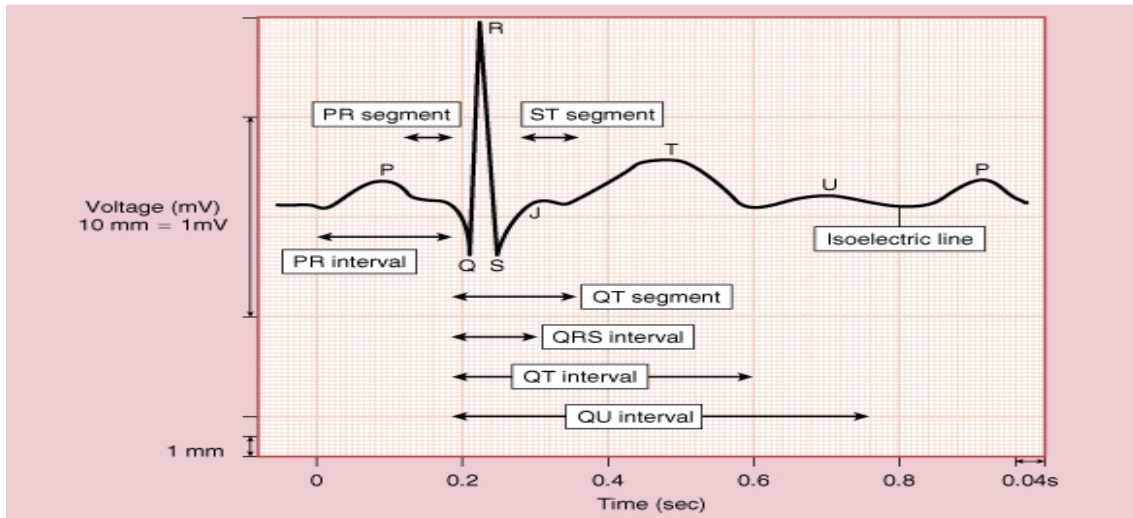
According to the new guidelines, a cardiac troponin, myoglobin rise accompanied by typical symptoms, pathological Q waves, ST elevation or depression or coronary interventions are diagnostic of MI.

**ELECTROCARDIOGRAPH:** The electrocardiogram (ECG or EKG, abbreviated from the German Elektrokardiogramm) is a graphic recording of electric potentials generated by the heart. The signals are detected by means of metal electrodes attached to the extremities and chest wall and are then amplified and recorded by the electrocardiograph. ECG leads actually display the instantaneous differences in potential between these electrodes<sup>45</sup>.

**Fig 1.5:** - Electrocardiogram –I



The clinical utility of the ECG derives from its immediate availability as a noninvasive, inexpensive, and highly versatile test. In addition to its use in detecting arrhythmias, conduction



disturbances, and myocardial ischemia, electrocardiography may reveal other findings related to life-threatening metabolic disturbances (e.g., hyperkalemia) or increased susceptibility to sudden cardiac death (e.g., QT prolongation syndromes). The advent of coronary thrombolysis or angioplasty in the early therapy of acute myocardial infarction has refocused particular attention on the sensitivity and specificity of ECG signs of myocardial ischemia<sup>46</sup>.

Many cardiac abnormalities alter the heart's electrical activity, and cause changes in the ECG. Since the electrical activity of both atria and ventricles is reflected in the ECG, the test is of particular value in defining cardiac rhythm. Diseases which result in changes in the myocardial muscle mass will alter the ECG. Diseases which cause death of heart muscle and replacement by scar tissue (such as MI) will be reflected in characteristic changes in morphology of the QRS complex. Inadequate blood supply to heart muscle resulting from coronary artery disease may cause alterations in the repolarization of muscle cells, which will be reflected in characteristic changes in the ST-T wave portion of the electrocardiogram.

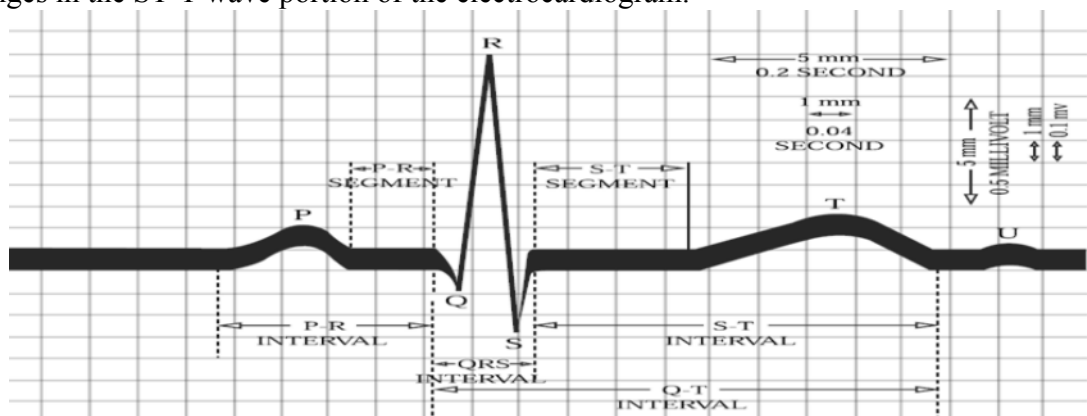


Fig 1.6: Electrocardiogram<sup>47</sup>

From left to right the first deflection seen in Figure 1.6 is labeled a P -wave. It represents the voltage change at the body's surface caused by the depolarization of the atria. Atrial depolarization is usually complete in about 0.1 seconds. Therefore, the P -wave usually spans about 2.5 millimeters. A P-wave typically stands 1-2 millimeters tall (0.1-0.2 millivolts).



Once the P-wave is completed, an isoelectric segment follows during which no surface potential is visible using ordinary equipment. During this time the cardiac action potential passes through the AV node and ventricular conduction system.

The interval from the beginning of the P-wave to the beginning of the QRS complex is called the PR interval and is normally no longer than 0.2 seconds in adults (Figure 1.6).

A wave corresponding to atrial repolarization occurs, but is ordinarily buried in the QRS complex, and is not identifiable in the ECG.

The QRS wave complex follows the PR segment. It represents ventricular depolarization, lasts approximately 80 -100 milliseconds, and has amplitude of 0.5 -1.0 millivolts. The QRS depolarization is much greater in amplitude than the P -wave complex because of the greater muscular mass of the ventricle, and the greater synchronization of depolarization by the high speed ventricular conduction system.

At the completion of the QRS complex, another segment of zero voltage normally follows: the ST segment. It corresponds to the plateau period of the action potential during which the ventricles remain depolarized. It typically lasts 150 milliseconds, but is a function of heart rate. The T -wave follows the ST -segment, and corresponds to ventricular repolarization. Cellular repolarization is a much slower process than depolarization. Also, repolarization does not appear to propagate from cell to cell. Rather, individual cells repolarize independently depending on their individual plateau duration. Whereas depolarization spreads from endocardium to epicardium, repolarization normally proceeds in the opposite direction (the action potentials of epicardial cells are shorter than those of endocardial cells). Normal T -wave duration is 0.15-0.20 seconds, and normal amplitude in the limb leads is less than 0.6 millivolts<sup>48</sup>.

**ELECTROPHYSIOLOGY:-**Depolarization of the heart is the initiating event for cardiac contraction. The electric currents that spread through the heart are produced by three components: cardiac pacemaker cells, specialized conduction tissue, and the heart muscle itself. The ECG, however, records only the depolarization (stimulation) and repolarization (recovery ) potentials generated by the atrial and ventricular myocardium.

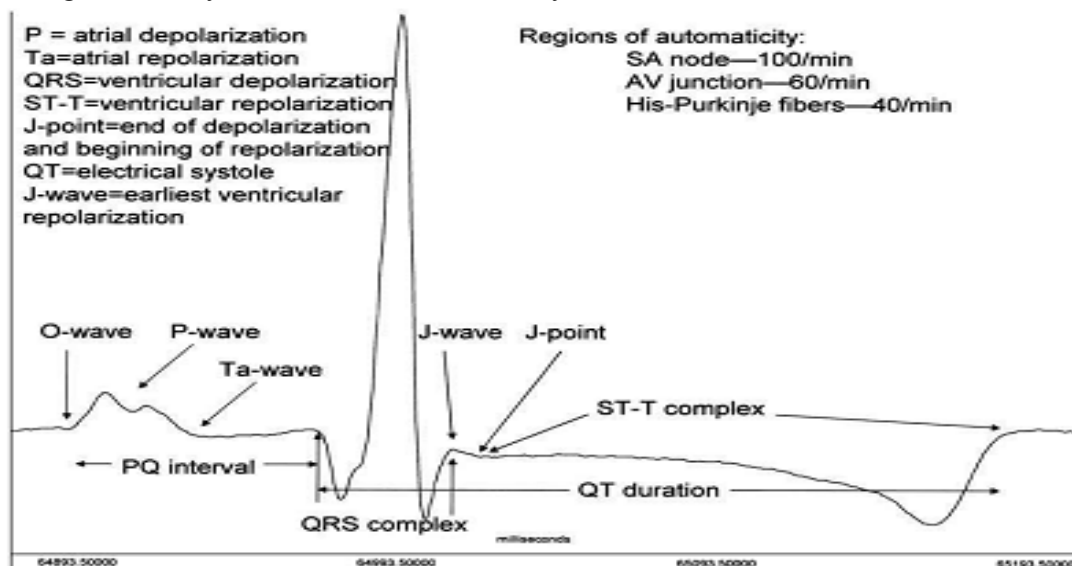


Fig. 1.7: - Electrocardiogram –II<sup>43</sup>

**P wave** is 110 milliseconds or less in duration; the first two -thirds are from right atrial depolarization, the last two -thirds from left atrial depolarization. In healthy person, the P wave

is upright in lead II and biphasic in lead V1; the first, positive deflection is larger than the second, negative one.

**PR interval** is 120–200 milliseconds in duration. A short PR interval may indicate an accessory pathway, which allows early ventricular depolarization ('pre-excitation'). A long PR interval reflects slow conduction through the AV node and bundle of His, and may indicate a conducting tissue disease predisposing to bradyarrhythmia through high-grade AV block. A PR interval of over 200 ms may indicate a first degree heart block. PR segment depression may indicate a atrial injury or pericarditis.

**QRS complex** is 120 milliseconds or less in duration. The QRS complex corresponds to the depolarization of the ventricles. Because the ventricles contain more muscle mass than the atria, the QRS complex is larger than the P wave. In addition, because the His/Purkinje system coordinates the depolarization of the ventricles, the QRS complex tends to look "spiked" rather than rounded due to the increase in conduction velocity. The duration, amplitude, and morphology of the QRS complex is useful in diagnosing cardiac arrhythmias, conduction abnormalities, ventricular hypertrophy, myocardial infarction, electrolyte derangements, and other disease states.

**Q waves** can be normal (physiological) or pathological. Normal Q waves, when present, represent depolarization of the interventricular septum. For this reason, they are referred to as septal Q waves. Q waves greater than 1/3 the height of the R wave, greater than 0.04 sec (40 ms) in duration, or in the right precordial leads are considered to be abnormal, and may represent myocardial infarction.

**ST segment** connects the QRS complex and the T wave and has duration of 80 to 120 millisecond. It starts at the J point and ends at the beginning of the T wave. However, since it is usually difficult to determine exactly where the ST segment ends and the T wave begins, the relationship between the ST segment and T wave should be examined together.

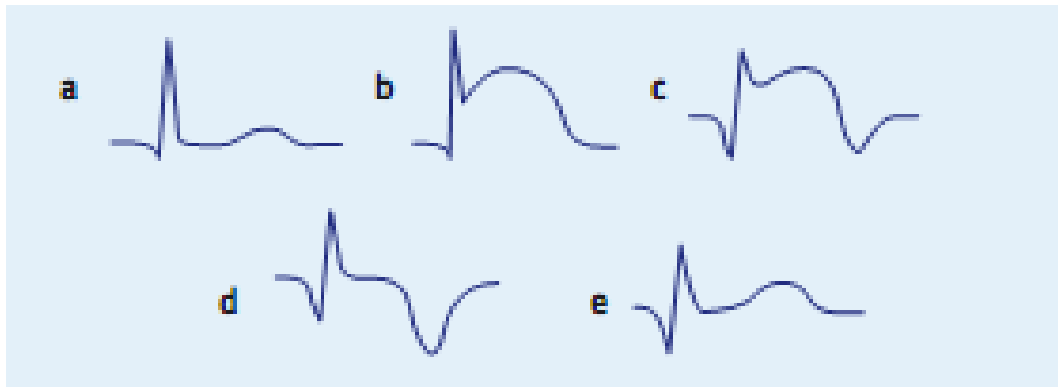
**ST segment** is isoelectric. 'Physiological' ST elevation is usually restricted to leads V1 to V3/4. Flat, down sloping or depressed ST segments may indicate coronary ischemia. ST segment elevation may indicate myocardial infarction.

**T wave** represents the repolarization (or recovery) of the ventricles. The interval from the beginning of the QRS complex to the apex of the T wave is referred to as the absolute refractory period. The last half of the T wave is referred to as the relative refractory period.

**Inverted (or negative) T waves** can be a sign of coronary ischemia, left ventricular hypertrophy. Tall or "tented" symmetrical T waves may indicate hyperkalemia. Flat T waves may indicate coronary ischemia or hypokalemia. The earliest electrocardiographic finding of acute myocardial infarction is sometimes the hyper acute T wave, which can be distinguished from hyperkalemia by the broad base and slight asymmetry.

**QT interval** is 0.30 and 0.44 seconds in duration. The QT interval is important in the diagnosis of long QT syndrome and short QT syndrome. The QT interval represents on an ECG the total time needed for the ventricles to depolarize and repolarize.

**U wave** is not always seen. It is typically small, and, by definition, follows the T wave. U waves are thought to represent repolarization of the papillary muscles or Purkinje fibers. Prominent U waves are most often seen in hypokalemia, but may be present in hypercalcemia, thyrotoxicosis, or exposure to digitalis, epinephrine, and Class 1A and 3 antiarrhythmics, as well as in congenital long QT syndrome and in the setting of intracranial hemorrhage. An inverted U wave may represent myocardial ischemia or left ventricular volume overload<sup>26, 44</sup>  
Sequential changes of acute MI<sup>44</sup>



**Fig. 1.8:** - Sequential changes of acute MI.

Control, normal appearances are shown in the lead, which, as can be seen by its QRS morphology, lies facing the left ventricle.

The typical, convex upwards S-T elevation is shown occurring within hours of the onset of symptoms of infarction. At this stage, there is no change in the QRS complex.

The appearances within days of the onset are shown. There is loss of R wave height, abnormal Q waves (in this case in both depth and duration) have developed, and there is T wave inversion.

The loss of R wave height and the abnormal Q waves prove infarction. The S-T segment and T wave changes indicate that the event is recent.

Resolution of the S-T segment change is shown. In other respects, the appearances are similar to c. The loss of R wave height and the abnormal Q waves prove infarction. The normal S-T segment indicates that the event is not very recent (i.e. not within days) but T wave changes indicate that the event is relatively recent (within weeks).

Restoration of an upright T wave is shown, but this is otherwise similar to d. The loss of R wave height and the abnormal Q waves prove infarction. The normal S-T segment indicates that the event is not very recent (i.e. not within days) and the normal T wave that the event is relatively old (not within weeks).

### **CARDIAC MARKER:**

Medical tests that are often referred to as cardiac markers include<sup>1,49</sup>:

Cardiac troponin (the most sensitive and specific test for myocardial damage)

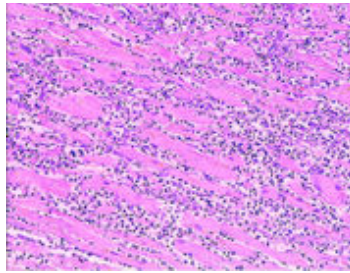
Creatine kinase (CK, also known as phosphocreatine kinase or creatine phosphokinase)

Aspartate transaminase (AST, also called Glutamic Oxaloacetic Transaminase (GOT/SGOT) or aspartate aminotransferase (ASAT)).

Lactate dehydrogenase (LDH)

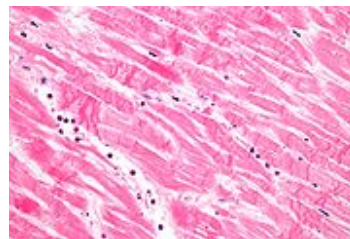
Myoglobin (Mb) has low specificity for myocardial infarction and is used less than the other markers.

Cardiac markers or cardiac enzymes are proteins from cardiac tissue found in the blood. These proteins are released into the bloodstream when damage to the heart occurs, as in the case of MI. Depending on the marker, it can take between 2 to 24 hours for the level to increase in the blood. Additionally, determining the levels of cardiac markers in the laboratory - like many other lab measurements - takes substantial time. Cardiac markers are therefore not useful in diagnosing a MI in the acute phase. Also these enzyme levels are not elevated immediately following a heart attack, patients presenting with chest pain are generally treated with the assumption that a MI has occurred and then evaluated for a more precise diagnosis<sup>50</sup>. The clinical presentation and results from an ECG are more appropriate in the acute situation. Now a day's novel cardioprotective "urocortins" and "endoglin" determination is used as a novel prognostic marker after AMI<sup>51,52</sup>.

**HISTOPATHOLOGY:**

**FIG 1.9:** Microscopy image (magn. ca 100x, H&E stain) from autopsy specimen of myocardial infarct (7 days post-infarction).

Histopathological examination of the heart may reveal infarction at autopsy. Under the microscope, MI presents as a circumscribed area of ischemic, coagulative necrosis (cell death). On gross examination, the infarct is not identifiable within the first 12 hours.<sup>53</sup>



**FIG 1.10** Micrograph of a MI (ca. 40x H&E stain) with prominent contraction band necrosis.

Although earlier changes can be discerned using electron microscopy, one of the earliest changes under a normal microscope are so-called wavy fibers.<sup>54</sup> Subsequently, the myocytes cytoplasm becomes more eosinophilic (pink) and the cells lose their transversal striations, with typical changes and eventually loss of the cell nucleus.<sup>55</sup> The interstitium at the margin of the infarcted area is initially infiltrated with neutrophils, then with lymphocytes and macrophages, who phagocytose ("eat") the myocytes debris. The necrotic area is surrounded and progressively invaded by granulation tissue, which will replace the infarct with a fibrous (collagenous) scar (which are typical steps in wound healing). The interstitial space (the space between cells outside of blood vessels) may be infiltrated with red blood cells.<sup>53</sup>

These features can be recognized in cases where the perfusion was not restored; reperfused infarcts can have other hallmarks, such as contraction band necrosis.<sup>56</sup>

**TREATMENT OF MI:**

**Table 1.1:** Treatment of MI<sup>56</sup>.

Class of drug	Action	Drug
Beta blockers	heart's workload	Nadolol, Metoprolol, Pindolol, Bisoprolol etc.
Diuretics	Rid body of excess fluid and salt	Hydrochlorothiazide, Chlorothiazide, Furosemide, Triamterene, Spironolactone etc
ACE inhibitors	Prevent blood vessel constriction	Benazepril, Lisinopril, Captopril, Ramipril, Fosinopril, Moexipril.
Calcium channel blockers	prevent blood vessel constriction by blocking calcium ions	Verapamil, Diltiazem, Nifedipine.
Nitrates	Help relax the myocardium and blood vessels	Nitroglycerin, Isosorbide dinitrate.

**DISCUSSION:-** Beta-blockers, angiotensin-converting-enzyme (ACE) inhibitors, and aldosterone antagonists have been shown to reduce the overall risk of death as well as the risk of major nonfatal cardiovascular events when they are administered to patients with acute myocardial infarction who also have left ventricular systolic dysfunction, clinical evidence of heart failure, or both.<sup>57,58</sup> However, there remains a sizable subgroup of patients in whom clinical heart failure worsens despite optimal medical therapy after acute myocardial infarction. Relevant to this discussion is the observation that ACE inhibitors block only 13 percent of the total production of angiotensin II in the human heart because of the existence of ACE-independent pathways (e.g., chymase, cathepsin, and kallikrein) that convert angiotensin I to angiotensin II.<sup>59</sup> These observations provided the impetus for the development of angiotensin-receptor antagonists that offer more complete protection against angiotensin II by directly blocking the angiotensin type I receptor.

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## Cancer Classification Technique in Deep Neural Networks

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**Abstract:**-Artificial Intelligence (AI) is used extensively in many fields of medicine and assisting doctors in various steps of patient management due to its rapid technological advancements. In healthcare systems, the AI is utilized to enhance the clinical care, prescriptions from doctors and follow up of transplant recipients. The medical assisted diagnosis systems are developed for various diseases such as cancer, diabetes, neuromuscular disorders, cardiology, Alzheimer, etc. Since, a huge amount of data is created in the various sectors of the healthcare industry that are medical research, medical equipment, healthcare providers, life sciences and medical insurance. In this research, a deep learning is used for classifying the diseases from the collected data's of patients. An effective feature extraction technique is used to extract the optimal features from the patient's medical history. However, deep learning requires a considerable amount of uniform training data, which introduces difficulties in many application scenarios. But, in this research only fewer amounts of training data is required for obtaining higher classification accuracy. This AI based classification among the diseases used for predicting the possible diseases in the medical healthcare systems.

**Keywords:**-Artificial intelligence, classification accuracy, deep learning feature extraction, healthcare systems, medical assisted diagnosis.

### 1. INTRODUCTION

Automatic computer assisted diagnoses are enormously being combined with patient healthcare systems [1]. In several healthcare applications, the AI software is developed/implemented that includes patient monitoring, medical diagnostics and learning healthcare systems. Thus leads to supports the public health policy making and/or clinical decision-making by developing the AI algorithms and software. Subsequently, this AI algorithm uses computerized predictive analysis algorithm in large data sets for filtering, organizing and searching of patterns. Since, the utilized large data sets are acquired from the multiple sources. Also, the AI algorithm provides a probability analysis for analyzing which healthcare offers faster and informed decisions [2]. The survival rate of human is increased based on the early prediction of diseases. The health condition is generally measured from health to maximum risk position, to minimum risk position, to the existence of previous lesions status, to medical syndrome state and to the defected condition. The process of disease identification takes longer duration which is related with the genetic aspect of human, personal lifestyle and natural climatic factors [3]. In an ambient assisted living environment, an artificial intelligence and decision support systems provides higher capacities in health monitoring. Artificial intelligence and decision support systems offer a plethora of health monitoring capabilities in Ambient Assisted Living (AAL) environment. Continuous assessment of health indicators for elderly people living on their own is of utmost importance, so as to prolong their independence and quality of life [4]. Machine learning strategies in human movement, including neural networks and support vector machines (SVM), have gained popularity as they offer an objective approach to identifying or differentiating subgroups of individuals with movement disorders and quantifying outcomes of

surgical or therapeutic intervention [5]. Recent advances in technology have enabled the recording of vast amounts of data. Machine learning methods have been proposed to aid in the interpretation of such data for clinical decision making and diagnosis. However, most current applications of machine learning fail to mimic the personalized diagnostic process of real clinical settings [6]. Moreover, the feature selection i.e., identifying an effective biomarkers is used for effective disease diagnosis and identification [7].

There are different kinds of diseases are analyzed using this AI based systems. Some of techniques are mentioned as follows: An artificial neural networks -based (ANNs) diagnostic model is developed for coronary heart disease (CHD) using a complex of traditional and genetic factors of this disease [8]. The global point signatures -based asymmetry analysis able to simultaneously quantify the shape and pigmentation distributions of cutaneous lesions [9]. The Particle Swarm Optimized Wavelet Neural Network is used for detection of breast abnormalities in digital mammograms. Here, a pattern classifier is used for classifying the suspicious regions [10]. The multiple kernel learning strategy is used for diagnosing the diseases in the salient brain pattern [11]. A decision tree based classifier and also Multiple -Instance Learning -Based Approach is used for diagnosing the tuberculosis using the segmented lung field [12] [13]. In this research, the semi supervised deep neural Network is developed to classify the patient's disease.

## 2. LITERATURE SURVEY

This section provides the literature survey of existing techniques related to the medial disease analysis.

Ross, J.C., Castaldi, P.J., Cho, M.H., Chen, J., Chang, Y., Dy, J.G., Silverman, E.K [14] presented the Bayesian nonparametric model for detecting the Emphysema disease. The disease subtypes were detected based on the Bayesian nonparametric model which uses the concept of disease trajectories. Additionally, the percentages of tissue patterns were detected by using tissue classification that depends on the lung density's local histogram. This classification was non parametric and it can automatically detect the disease trajectories. But this classification method was mainly based on the smoke exposure, increasing age, gender and current smoking status.

Bakiya, A., Kamalanand, K., Rajinikanth, V., Nayak, R.S. and Kadry, S [15] developed the Deep Neural Networks (DNN) and Particle Swarm Optimization (PSO) to detect the Neuromuscular disorders. The time -frequency domain based features of EMG signals were extracted by using Stockwell-Transform (ST), Wigner -Ville Transform (WVT) , Synchro -Extracting Transform (SET) and Short-Time Fourier Transform (STFT). After reducing the features by using fractional PSO, the features were classified by using DNN. The amounts of features were reduced from eighty to fifteen by using PSO with fractional velocity update. The classification specificity was decreased with respect to the increment in the amount of hidden layers.

Roopa, H. and Asha, T [16] presented Principal Component Analysis (PCA) was used to obtain the attributes from the Pima India n Diabetes Data (PIDD). Then the diabetes disease was identified by using the Linear Regression Model (LRM). Here, the PCA was used for approximating the features of PIDD for the ease of classification. The PIDD dataset used in this classification was considered only the women who are age about 21. More than 21 age of persons were not considered in this work.

Hekler, A., Utikal, J.S., Enk, A.H., Hauschild, A., Weichenthal, M., Maron, R.C., Berking, C., Haferkamp, S., Klode, J., Schadendorf, D. and Schilling , B [17] developed the skin cancer classification by using the combination of decision of dermatologists from German university hospitals and Convolutional Neural Networks (CNNs). The dermatologist's responses and CNN

results were appropriately processed to fuse the dermatologist's responses with CNN results. Here, CNN only classifies the skin cancer; it fails to detect the location of skin cancer.

Guo, K., Ren, S., Bhuiyan, M.Z.A., Li, T., Liu, D., Liang, Z. and Chen, X [18] presented the deep convolutional neural network to obtain a medical-assisted diagnosis model for obtaining the disease type. The accuracy of the classification is improved by generating new features using variation auto encoder. But, the method of replicating the data for improving the accuracy is invalid in the medical assisted diagnosis.

Owais, M., Arsalan, M., Choi, J. and Park, K.R [19] developed the medical image classification and retrieval framework by using the ResNet50 CNN model. In this CNN model, the  $7 \times 7 \times 2048$  convolution layer is used instead of the  $7 \times 7$  average pooling layer. The conventional 2D convolution operation was used the different number of filters with different sizes for accomplishing the feature extraction. This CNN model was used to classify 50 classes of images that includes cardiac MRI, lung CT, bladder MRI, etc. The usage of deep CNN was required higher training time during medical image classification.

Bai, W., Sinclair, M., Tarroni, G., Oktay, O., Rajchl, M., Vaillant, G., Lee, A.M., Aung, N., Lukaschuk, E., Sanghvi, M.M. and Zemrak, F [20] presented the automated method namely deep Fully Convolutional Network (FCN). This deep FCN was used for both the long-axis and short-axis Cardiovascular Magnetic Resonance (CMR) images of UK Bio bank dataset. This FCN was used the features from the fine to coarse scales and the multi-scale features were combined to predict the label at each pixel. However, this FCN was trained mainly based on the single dataset which is relatively homogeneous dataset. This UK Bio bank dataset has majority data related to the healthy subjects.

Arafati, A., Hu, P., Finn, J.P., Rickers, C., Cheng, A.L., Jafarkhani, H. and Kheradvar, A [21] developed the AI-based methods such as DNN and CNN for CMR analysis from the MICCAI 2009, MICCAI 2011 and HVS MR database. The AI methods were classified five different classes such as normal, systolic heart failure, dilated cardiomyopathy, hypertrophic cardiomyopathy, and abnormal Right Ventricle (RV). The DNN used in the classification has the ability of handling huge amount of data. The performance of AI algorithms was mainly depends on the quality and quantity of training data.

Schlemper, J., Caballero, J., Hajnal, J.V., Price, A.N. and Rueckert, D [22] presented the deep cascade of CNN for improving the data acquisition process. This CNN was used the cardiac MR Dataset consisting of 10 fully sampled short-axis cardiac cine MR scans. Next, the iterative architecture and intensive data augmentation were used for overcome the over fitting issue. The result obtained from the CNN was affected due to higher dynamic content in the cardiac sequences.

Genovese, D., Rashedi, N., Weinert, L., Narang, A., Addetia, K., Patel, A.R., Prater, D., Gonçalves, A., Mor-Avi, V. and Lang, R.M [23] developed Machine Learning (ML) based Three-dimensional echocardiography (3DE) algorithm for providing the precise information about RV volume. The ML algorithm was used to calculate the End-systolic and end-diastolic RV volumes (ESV, EDV) and ejection fraction (EF). This ML algorithm was used to detect the cardiac structures and chambers in 3DE data sets. The classification accuracy of this automated ML analysis was strongly influenced by image quality.

Benba, A., Jilbab, A. and Hammouch, A [24] presented the 3 Cepstral techniques such as Mel frequency cepstral coefficients, Perceptual Linear Prediction (PLP) and relative spectral PLP to extract the cepstral coefficients from voice samples. This cepstral coefficient was used to classify the Parkinson's disease and Neurological disorders. Next, the average values of cepstral

coefficients were computed to compress the coefficients for reducing the processing time. The ratio of error while differentiating Parkinson's disease and Neurological disorders was not minimized in the cepstral domain.

Jiang, P., Wang, X., Li, Q., Jin, L. and Li, S [25] developed the correlation-aware sparse and low-rank constrained multi-task learning namely CSL for predicting the Alzheimer's disease. The non-smooth convex objective formulation was optimized by using an effective iterative algorithm. The dataset used for Alzheimer disease classification is Alzheimer's Disease Neuroimaging Initiative (ADNI) dataset. The usage of single modality data was improved the prediction performances. But, the power of prediction was mainly depends on the average cortical thickness.

Thompson, W.R., Reinisch, A.J., Unterberger, M.J. and Schriebl, A.J [26] presented the AI-based murmur detection algorithm to diagnose the heart diseases by considering the recorded heart sounds. Here, the cases from the Johns Hopkins Cardiac Auscultatory Recording Database (CARD) were selected in this heart classification. The complex anatomic variation present in congenital heart disease was proved as challenging task in AI based disease detection.

Jeyaraj, P.R. and Nadar, E.R.S [27] developed the partitioned deep Convolution Neural Network (CNN) with two partitioned layers for labeling and classifying the oral cancer. This CNN used different datasets for oral cancer classification such as BioG PS UCI repository, TCIA and GDC. The bagging and boosting method were selected for improving the accuracy during oral cancer classification. This bagging and boosting method was combined the results from the decision tree and selected an adequate feature based on the weight value. The deep CNN was highly reliable only when there is higher training data in oral cancer classification.

Hong, W., Xiong, Z., Zheng, N. and Weng, Y [28] presented the medical-history-based potential disease prediction algorithm for diagnosing the diseases. The latent feature of the patient was modeled by using the weighted significance between diseases in the weighted-sum operation. The extracted latent feature was shown the health condition of the patient. The possibility of disease is identified by combining both the high-order and low-order relations. This method doesn't evaluate the accuracy during disease recognition.

Sandhiya and Palani, [29] developed CNN with temporal data for prediction of heart disease, diabetes disease and cancer disease. The Conditional Random Field (CRF) and Linear correlation coefficient features selection method is used for the prediction. The UCI medical dataset were used to evaluate the performance of the method. The CNN with feature selection method has the higher accuracy in less time with low alarm false rate. The efficiency of the disease prediction method is required to be improved.

Kumar, et al. [30] presented fuzzy rule based Neural Network for the classification of diabetes disease and severity. The cloud and IoT based healthcare system is developed for diagnosis and monitoring the diabetes patient. The UCI medical data were used to analysis the performance of the method. The experimental result shows that the performance of method is higher than existing method. The deep learning method is need to be apply for effective performance of the prediction.

**3.OBJECTIVE OF THIS RESEARCH:-**The main aim of this research to design and develop an appropriate medical assisted diagnosis system for classifying the human diseases. The main objective of this research are specified as follows:

- To reduce the requirement of large training data set, a semi supervised DNN is designed and implemented in this medical assisted diagnosis.



- To identify the exact location of the disease, an effective feature extraction and semi supervised DNN are used in this system.
- An appropriate pre processing is used to enhance the quality of patient's medical history. Also, it removes the unwanted noises present in the information.
- The semi supervised DNN is used to reduce the computation time for the classification among the diseases.

**4. STUDY AREA AND METHODOLOGY :-** In this research, a semi supervised DNN is used for classifying the various diseases in the field of medical assisted diagnosis. Also, this AI application supports the physicians and medical professionals in various domains such as geocoding health data, epidemic and syndromic surveillance, health information systems, medical imaging, and predictive modeling and decision support. In this proposed research, the biomedical information (image/signal/data) is used for the classification. This information comprises the information about the physiological events and their analysis that is beneficial for primary detection, diagnosis, management and for the treatment of various pathological conditions and diseases. The block diagram of this medical assisted diagnosis is illustrated in the Figure 1. The important steps possessed in the proposed research is given as follows:

1. Input acquisition from the desired dataset
2. Preprocessing for enhancing the data quality.
3. Adequate features are extracted by using an effective feature extraction technique.
4. Initializing the semi supervised DNN model and training this DNN using extracted features.
5. Finally, the performances are evaluated based on the classification result from the DNN.

#### 4.1. Input acquisition

Initially, the input data set is acquired from the dataset. The dataset may contain biomedical image for the purpose of medical assisted diagnosis.

#### Biomedical image

Biomedical images are images of in physiological processes for both diagnostic and therapeutic purposes. They can be captured through advanced sensors and computer technology. CT, SPECT, PET, and MRI are examples of main biomedical imaging technologies to identify functional and anatomical condition of an organ or tissue and to monitor a patient for diagnostic and treatment evaluation.

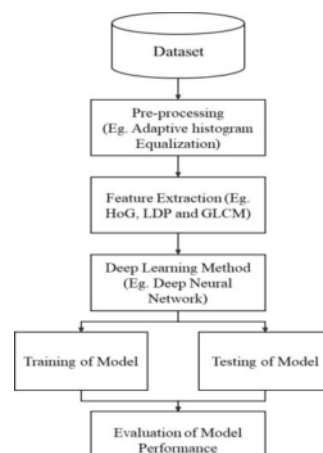


Figure 1. Block diagram of proposed research



## 4.2. Pre-processing

Due to noisy, inconsistent and incomplete data, preprocessing plays an important role. It is one of the preliminary steps that are required to acquire the high accuracy of steps.

### Pre-processing for biomedical image

But the medical images are generally complex in nature and also noisy. Medical images contain several noises like salt and pepper noise and speckle noise, echo perturbation etc. Therefore these noises should be removed before the segmentation process for the correct output. The examples for Gabor filter, adaptive median filter, morphological operations, image normalization, etc.

## 4.3. Feature extraction

Feature selection is essential for predictive modeling, and machine learning is particularly useful for it. Feature selection is one of the key topics in machine learning and other related fields; it can remove the irrelevant even noisy features and hence improve the quality of the data set and the performance of learning systems. The feature extraction examples for medical images are Histogram of Oriented Gradients (HOG), Gray Level Co-occurrence Matrix (GLCM), Local Binary Pattern (LBP), Local Ternary Pattern (LTP), Local Directional Pattern (LDP), etc. The feature extraction examples for medical signals are entropy features, statistical features etc. Also, the feature extraction examples for the medical data's are bag of features. Among these methods, a suitable method is selected for the feature extraction.

## 4.4. Modelling of deep neural network

Artificial neural networks are structurally and conceptually inspired by the human biological nervous system. Thus, adding more hidden layers allows dealing with complex data as hidden layers capture nonlinear relationships. These neural networks are known as Deep Neural Networks. Deep learning provides a new cost-effective way to train DNNs, which were slow in learning the weights. Extra layers in DNN enable the composition of features from lower layers to the upper layer by giving the potential of modeling complex data. A deep neural network hierarchically stacks multiple layers of neurons, forming a hierarchical feature representation. The number of layers now extends to over 1,000! With such a gigantic modeling capacity, a deep network can essentially memorize all possible mappings after successful training with a sufficiently large knowledge database and make intelligent predictions, e.g., interpolations and/or extrapolations for unseen cases. Thus, deep learning is generating a major impact in computer vision and medical imaging. In fact, a similar impact is happening in domains like text, voice, etc., i.e., identifying indicators for cancer in blood and tumors in MRI scans. It is the improvement of artificial neural networks that consist of more hidden layers that permits a higher level of abstraction and improved image analysis. It becomes an extensively applied method due to its recent unparalleled results for several applications. The architecture for the deep neural network is given in the following Figure 2.

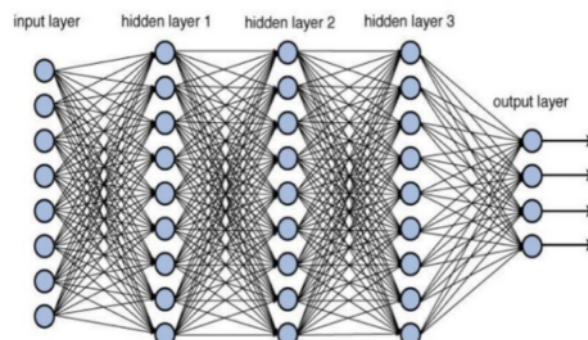


Figure 2. Architecture of the deep neural network

#### 4.4.1. Training of DNN model

In this proposed research, the semi supervised DNN is used for achieving the higher classification results. The utilization of semi supervised DNN requires only lesser amount of data's for training process. The main difference among the DNN and semi supervised DNN is that the DNN requires higher amount of data for higher classification accuracy. By using this kind of DNN, the classification among the various diseases is obtained in medical assisted diagnosis.

#### 5.EXPECTED OUTCOME

This section provides the expected outcome of the existing works that is related to medical assisted diagnosis.

In [24], 3 Cepstral techniques were used to extract the Cepstral coefficients from voice samples. Thus leads to classify the PD and ND. The performances analyzed in the PD and ND were sensitivity, specificity, probability excess and Matthews correlation. A multi-task learning formulation [25] that considers a correlation-aware sparse and low-rank constrained regularization, for accurately predicting the Alzheimer's disease. The performances analyzed in the multi-task learning are weighted correlation coefficient, normalized mean square error and root mean square error. Next, the AI-based murmur detection algorithm [26] uses the recorded heart sounds to diagnose the heart diseases. This heart disease classification analyzes the sensitivity, specificity and accuracy.

#### 6.CONCLUSION

Artificial intelligence offers this same transformative potential for the augmentation and potential replacement of human tasks and activities within a wide range of industrial, intellectual and social applications. AI can also be used to automatically spot problems and threats to patient safety, such as patterns of sub-optimal care or outbreaks of hospital-acquired illness with high accuracy and speed. In this research paper, the deep learning is designed to improve the classifications in the medical assisted diagnosis. Biomedical signal and image analysis is essential in diagnosis, treatment, management and classification of diseases. This system will be able to analyze various types of biomedical signals, data and images by selecting the proper analysis and extracting relevant features. So, this research will give better diagnostic results among various classifications of diseases.

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## ARTICAL ON THE SYSTEM RELIABILITY ANALYSIS USING RPGT -A GENERAL APPROACH

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### ABSTRACT:

In the present paper, reliability analysis is examined for consistent state. The Processing/Manufacturing industry is isolated into numerous sub systems. Subsystems are either in parallel/equal or in arrangement. Taking failure and repair rates constant. The subsystem may flop totally through partial disappointment. At the point when any subsystem flops then the framework is in bombed state. A state diagram of system portraying the transition rates is drawn. Articulations for way probabilities mean sojourn times, MTSF, availability, busy period of the server and expected no. of server's visits are inferred utilizing RPGT. Behaviour analysis of the framework is done. Graphs are prepared to compare and draw the conclusion

**KEYWORDS:-** RPGT, MTSF, Availability

**Introduction:-**The researchers have talked about the reliability and accessibility of numerous stochastic systems and processing industry by utilizing awkward and time-consuming techniques. Goel, P., Goyal, V., Kumar, A., Singh J. what's more, numerous others, have examined and talked about systems under consistent state conditions, utilizing the accompanying formulae of the RPGT to find the key parameters of a stochastic system:

- a) MTSF
- b) Availability
- c) Server of the busy period
- d) Expected number of server's visits/replacements

**Reliability:-**Reliability is well-defined as the probability of a framework execution its purpose adequately for the period proposed under stated conditions.

**Availability:-**Availability is the mix of two components reliability and maintainability. This implies that helpless reliability can be balanced by correspondingly improved maintainability and faster the support action rate, the better is the subsequent availability. In the event that down time is low, availability will be high. Reliability is a specific instance of availability wherein which no upkeep activity is practiced.

**Failure Rate:** Failure rate is the occurrence, with which a framework fails. Failures conveyed in hour and signified by the  $\lambda$ . Failure rate of the framework depends on time, with the rate variable over the life cycle of system.

**Subsystem:** A subsystem is a set of components, which is a system that one, and a component of a greater system.

**System:** System is an assortment of interdependent parts shaping an integrated set of elements and connections which are not the same as relationships of the set.

**Markov Process:** A interaction is called Markov process in which present state is free of past states for example processes memory less and is otherwise called Markov chain.

**ASSUMPTIONS AND NOTATIONS:-**

1. Repaired unit works similar to a new-one.
2. The framework is discussed for consistent state conditions.
3. Failure, repair and treatment time are statistically constant.

$pf$  : probability factor.

$\underline{k}$  : Non-regenerative state.

$\overline{cycle}$  : Circuit formed through un-failed states.

k-cycle : a circuit whose termini stand at regenerative state k.

$(\xi \xrightarrow{sf} i)$  : a fixed simple disappointment freeway from  $\xi$  to i-state.

$V_{k,k}$  :  $pf$  of state k accessible from in curable state k of k-cycle.

$V_{\overline{k},\overline{k}}$  :  $pf$  of state k accessible from in curable state k of  $\overline{k-cycle}$ .

$R_i(t)$  : reliability of framework at time t, given that frame work move in the un-failed regenerative state i at  $t=0$ .

$V_i(t)$  : expected no. of server visits of server for a given job in  $(0,t]$ , given that the framework arrived regenerative state i at  $t=0$ .

$f_j$  : Fuzziness measure of j-state.

$O$  : Unit is Good and in regular mode.

SG : Server is good.

$\lambda_i$  : Constant failure rate of unit's complete failure/ partial failure.

$\omega$  : Constant failure rate of server.

$p/q$  : Probability that repair of the unit at partial failure is not feasible/feasible.

$G(t)/F(t)$ : Cumulative circulation functions of repair -time of the totally failed unit/treatment time of server.

The framework could be in some of following states with respect to above symbols.



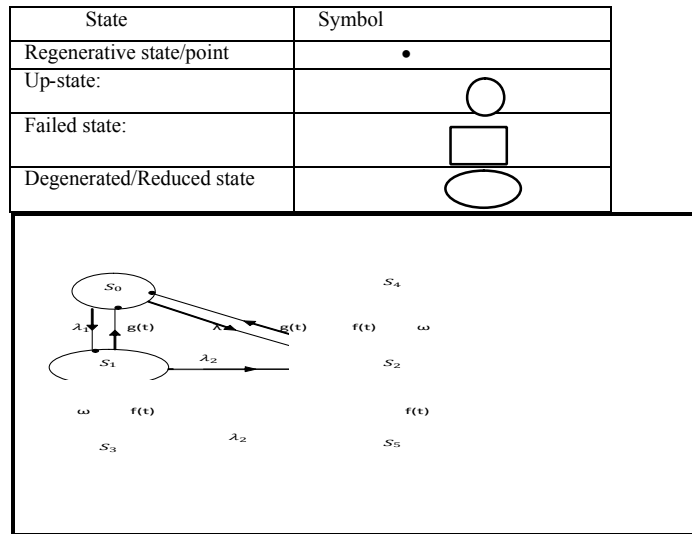


Fig.1 Transition Diagrams

**METHODOLOGY**

**Regenerative Point Graphical Technique:**

**4.1 Mean Time to System Failure:**

$$MTSF = \left[ \sum_{i, S_r} \left\{ \frac{\{pr(\xi^{S_r(sff)} \rightarrow i)\} \cdot \mu_i}{\prod_{k_1 \neq \xi} \{1 - V_{k_1, k_1}\}} \right\} \right] \div \left[ 1 - \sum_{S_r} \left\{ \frac{\{pr(\xi^{S_r(sff)} \rightarrow \xi)\}}{\prod_{k_2 \neq \xi} \{1 - V_{k_2, k_2}\}} \right\} \right]$$

**4.2 Availability:**

$$A_0 = \left[ \sum_{j, S_r} \left\{ \frac{\{pr(0 \rightarrow j)\} \cdot f_j \cdot \mu_j}{\prod_{k_1 \neq 0} \{1 - V_{k_1, k_1}\}} \right\} \right] \div \left[ \sum_{i, S_r} \left\{ \frac{\{pr(0 \rightarrow i)\} \cdot \mu_i^1}{\prod_{k_2 \neq 0} \{1 - V_{k_2, k_2}\}} \right\} \right]$$

**4.3 Server of busy period:**

$$B_\xi = \left[ \sum_{j, S_r} \left\{ \frac{\{pr(\xi^{S_r} \rightarrow j)\} \cdot \eta_j}{\prod_{k_1 \neq \xi} \{1 - V_{k_1, k_1}\}} \right\} \right] \div \left[ \sum_{i, S_r} \left\{ \frac{\{pr(\xi^{S_r} \rightarrow i)\} \cdot \mu_i^1}{\prod_{k_2 \neq \xi} \{1 - V_{k_2, k_2}\}} \right\} \right]$$

**4.4 The number of the Server’s visits/Replacements:**

$$V_\xi = \left[ \sum_{j, S_r} \left\{ \frac{\{pr(\xi^{S_r} \rightarrow j)\}}{\prod_{k_1 \neq \xi} \{1 - V_{k_1, k_1}\}} \right\} \right] \div \left[ \sum_{i, S_r} \left\{ \frac{\{pr(\xi^{S_r} \rightarrow i)\} \cdot \mu_i^1}{\prod_{k_2 \neq \xi} \{1 - V_{k_2, k_2}\}} \right\} \right]$$

**RESULTS:-**

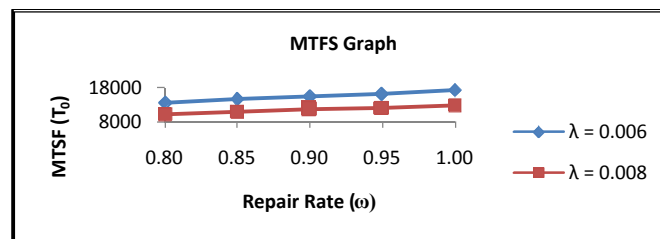
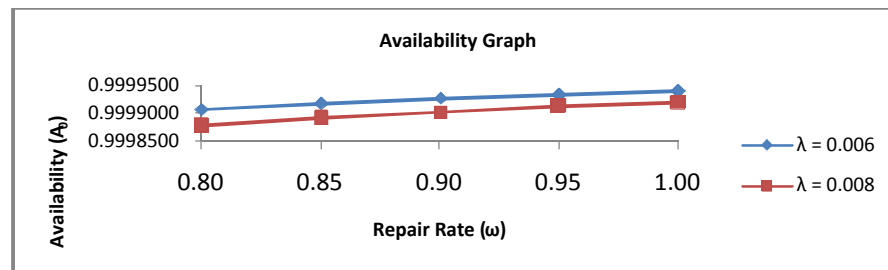


Fig. 2



**CONCLUSION:-**From the Graphs, we see that as the Repair Rate increases, Availability of the System increases, which should be. The study can be extended for two or more unit system having Perfect and Imperfect Switch-Over devices. The Regenerative-Point Graphical Technique is useful for the evaluation of the parameters in a simple way, without writing any state equations and without doing any lengthy and cumbersome calculations.

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## Plagiarism Awareness of the Academicians: A Survey

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**Abstract:** In this article, academicians working in the engineering colleges affiliated to the University of Mumbai are considered. The focused has been given on the awareness of the academicians in urban and rural area. Online survey has been conducted through Google forms. The opinions of the academicians regarding the plagiarism in general have been studied. Their views regarding plagiarism have been asked. The collected data have been analyzed and tested with T-test. It is found that, there is no significant difference of opinion among these two groups except few questions. Academicians working in rural area are very much alert about the plagiarism issues. Also, most of the academicians are very much enthusiastic to fill the Google form as a part of virtual education system. The analyzed data have been showed with the help of charts and diagrams.

**Keywords:** Academicians, Plagiarism, Engineering colleges, University of Mumbai.

**Introduction:** Now a day's plagiarism has become a very serious issue as far as research activities in academic fields are concerned. Due to the regular practice of copy-paste material among students, the plagiarism checking has become more important in all research activities in higher educational institutions. There are many examples in world history about the literature theft and many authors have faced the serious legal consequences. Plagiarism is one of the unethical ways choose by some students intentionally or unintentionally. It is a disciplinary offence as per the regulations, though the plagiarism happened intentionally or unintentionally. Hence, there should be some rules in higher educational institutions regarding the prevention of plagiarism in respect of the promotion of academic integrity. Many universities and colleges in developed countries have addressed the rules regarding plagiarism. However, in India there was no such rule in education field at central level till July 2018. In a present study the main objective is to find out the knowledge of the academicians regarding the plagiarism.

**Definitions of plagiarism:** Plagiarism is an act of theft a content of others and uses it as own. Some definitions of plagiarism are as under:

“The Merriam Webster dictionary defines the act of plagiarism as - to steal and pass off ideas or words of another as one's own”.

Oxford University: “Plagiarism is presenting someone else's work or ideas as your own, with or without their consent, by incorporating it into your work without full acknowledgement”.

**Indian scenario:** -Nowadays, there is huge information is available online through internet on any subject. Since this material is easily available, there has become a tendency in students to copy the material from internet and paste it in the academic project and presents it as their own without acknowledgement of the original author. If any scholar cheat through plagiarism it means they have lost the chance to uplift their knowledge in a specific subject area. Therefore, at any cost, everyone have to avoid plagiarism. In developed countries, many students have faced to serious consequences. Their academic future and sometimes work career also has been spoiled due to the strict provisions made in the regulations of plagiarism in higher educational

institutions. After the publication of UGC Regulations, 2018 in India regarding “Promotion of academic integrity and prevention of plagiarism in higher education institutions”, many higher education institutions have become very much alert on this issue. Many Indian Universities have introduced the topic of Research and Publication Ethics in the syllabus of their PHD coursework for the good quality research.

**Present study:** -Though the UGC Regulations has been published in the year 2018, there are many research scholars as well as academicians are not fully aware about these changes took place in higher education field in India. At the same time, there are many educational institutions have addressed the research and publication ethics at their institutions since the secondary school level. It is heard that, many PhD thesis are also observed as plagiarized. Earlier, there was no provision of software’s to check the plagiarism by rules in research activities in academic field. Therefore, there was no control on such activities. But the situation is changing slowly in India for the quality research. Considering the seriousness of the plagiarism issues in academic activities, the survey has been conducted to study the plagiarism awareness of the academicians working in engineering colleges affiliated to the University of Mumbai. The engineering colleges under University of Mumbai are scattered in 6 districts of Maharashtra which covers urban as well as rural area. There are six districts come under the University of Mumbai namely 1) Mumbai, 2) Thane, 3) Palghar, 4) Raigad, 5) Ratnagiri and 6) Sindhudurg.

The online survey has been conducted for the study. The questionnaire has been prepared on Google form and sent through the emails of the academicians, to find out the awareness of the plagiarism among academicians in Engineering institutes affiliated to the University of Mumbai. Total 67 engineering institutions are there affiliated to the University of Mumbai. Total 500 academicians from 67 colleges have been selected with random sampling technique. Total 500 Google forms have been mailed to the selected faculty members of engineering institutions affiliated to the University of Mumbai. Out of 500 academicians 439 have been responded to the questionnaires only working academicians have been focused in this survey. The study has been carried out with the intension to find out the knowledge of the academicians regarding plagiarism.

To examine their knowledge, following important questions were asked to the academicians about plagiarism.

1. Copying exact words from sources without quotation marks
2. Not giving reference even after taking consent of original author
3. Paraphrasing words of someone else without citing original source
4. Copying words from several sources and changing sentences
5. Copying from Internet but not citing source
6. Word to word translation from other language and presenting work as own
7. Some part of own article used in another article of your own self-plagiarism
8. Using a table figure or illustration without acknowledgement
9. Plagiarism is same as Copyright Act.

The questionnaire received from the Google form have been exported in excel sheet and analysis has been done with SPSS statistical software.

**Responses Received from the academicians are as below:**

**Table 1: What is Plagiarism in General?**

Plagiarism in General		Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree	Total
Copying exact words from the sources without quotation marks	Frequency	13	5	9	183	229	439
	Percent	3.0	1.1	2.1	41.7	52.2	100
Not giving reference even after taking consent of original author	Frequency	17	20	1	151	250	439
	Percent	3.9	4.6	.2	34.4	56.9	100
Paraphrasing words of someone else without citing original source	Frequency	9	20	4	177	229	439
	Percent	2.1	4.6	.9	40.3	52.2	100
Copying words from several sources and changing the sentences	Frequency	13	48	19	197	162	439
	Percent	3.0	10.9	4.3	44.9	36.9	100.0
Copying from Internet but not citing source	Frequency	15	31	2	193	198	439
	Percent	3.4	7.1	.5	44.0	45.1	100.0
Word to word translation from other language and presenting work as own	Frequency	12	31	18	152	226	439
	Percent	2.7	7.1	4.1	34.6	51.5	100.0
Some part of own -article used in another article of your own self-plagiarism	Frequency	20	116	54	149	100	439
	Percent	4.6	26.4	12.3	33.9	22.8	100.0
Using a table figure or illustration without acknowledgement	Frequency	7	21	17	193	201	439
	Percent	1.6	4.8	3.9	44.0	45.8	100.0
Plagiarism is same as Copyright Act	Frequency	30	107	34	208	60	439
	Percent	6.8	24.4	7.7	47.4	13.7	100.0

From the above tables it is inferred that, maximum faculty members are strongly agree and agree with the above statements. The maximum academicians are strongly agree with the following statements namely - Copying exact words from the sources without quotation marks (52.2%), Not giving reference even after taking consent of original author (56.9%), Paraphrasing words of someone else without citing original source (52.2%), Copying from Internet but not citing source (45.1%), Word to word translation from other language and presenting work as own (51.5%), Using a table figure or illustration without acknowledgement (45.8%). Also, some respondents have replied as they are agreeing with statements which are as follows - Copying words from several sources and changing the sentences (44.9%), Some part of own -article used in another article of your own self-plagiarism (33.9%), Plagiarism is same as Copyright Act (47.4%). It means we can say that the perspectives on plagiarism by the academicians are clear; At least 50% at an average academicians are well aware about the plagiarism in all respects.

#### Analysis of the responses received by the Academicians:

Table 2: Copying exact words from sources without quotation marks

	Frequency	Percent	Valid Percent	Cumulative Percent
1 Strongly Disagree	13	3.0	3.0	3.0
2 Disagree	5	1.1	1.1	4.1
3 Undecided	9	2.1	2.1	6.2
4 Agree	183	41.7	41.7	47.8
5 Strongly Agree	229	52.2	52.2	100.0
Total	439	100.0	100.0	

Table 3: Not giving reference even after taking consent of original author

	Frequency	Percent	Valid Percent	Cumulative Percent
1 Strongly Disagree	17	3.9	3.9	3.9
2 Disagree	20	4.6	4.6	8.4
3 Undecided	1	.2	.2	8.7
4 Agree	151	34.4	34.4	43.1
5 Strongly Agree	250	56.9	56.9	100.0
Total	439	100.0	100.0	

**Table 4:Paraphrasing words of someone else without citing original source**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid 1 Strongly Disagree	9	2.1	2.1	2.1
2 Disagree	20	4.6	4.6	6.6
3 Undecided	4	.9	.9	7.5
4 Agree	177	40.3	40.3	47.8
5 Strongly Agree	229	52.2	52.2	100.0
Total	439	100.0	100.0	

**Table 5:Copying words from several sources and changing sentences**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid 1 Strongly Disagree	13	3.0	3.0	3.0
2 Disagree	48	10.9	10.9	13.9
3 Undecided	19	4.3	4.3	18.2
4 Agree	197	44.9	44.9	63.1
5 Strongly Agree	162	36.9	36.9	100.0
Total	439	100.0	100.0	

**Table 6:Copying from Internet but not citing source**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid 1 Strongly Disagree	15	3.4	3.4	3.4
2 Disagree	31	7.1	7.1	10.5
3 Undecided	2	.5	.5	10.9
4 Agree	193	44.0	44.0	54.9
5 Strongly Agree	198	45.1	45.1	100.0
Total	439	100.0	100.0	

**Table 7:Word to word translation from other language and presenting works own**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid 1 Strongly Disagree	12	2.7	2.7	2.7
2 Disagree	31	7.1	7.1	9.8
3 Undecided	18	4.1	4.1	13.9
4 Agree	152	34.6	34.6	48.5
5 Strongly Agree	226	51.5	51.5	100.0
Total	439	100.0	100.0	

**Table 8:Some part of own-article used in another article of your own selfplagiarism**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid 1 Strongly Disagree	20	4.6	4.6	4.6
2 Disagree	116	26.4	26.4	31.0
3 Undecided	54	12.3	12.3	43.3
4 Agree	149	33.9	33.9	77.2
5 Strongly Agree	100	22.8	22.8	100.0
Total	439	100.0	100.0	



**Table 9:Using a table figure or illustration without acknowledgement**

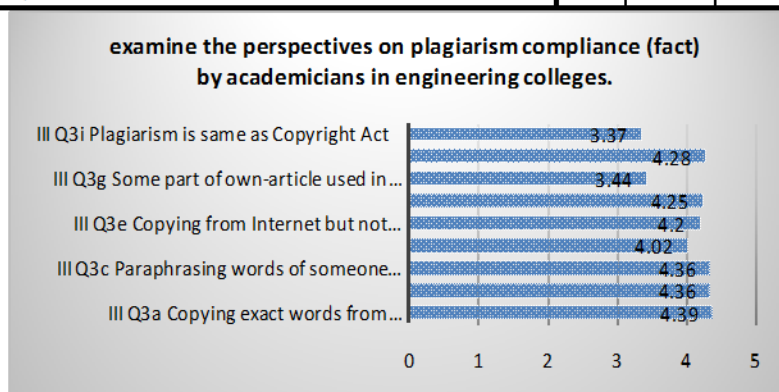
	Frequency	Percent	Valid Percent	Cumulative Percent
Valid 1 Strongly Disagree	7	1.6	1.6	1.6
2 Disagree	21	4.8	4.8	6.4
3 Undecided	17	3.9	3.9	10.3
4 Agree	193	44.0	44.0	54.2
5 Strongly Agree	201	45.8	45.8	100.0
Total	439	100.0	100.0	

**Table 10:Plagiarism is same as Copyright Act**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid 1 Strongly Disagree	30	6.8	6.8	6.8
2 Disagree	107	24.4	24.4	31.2
3 Undecided	34	7.7	7.7	39.0
4 Agree	208	47.4	47.4	86.3
5 Strongly Agree	60	13.7	13.7	100.0
Total	439	100.0	100.0	

**Table 11:Descriptive Statistics**

	N	Minimum	Maximum	Mean	Std. Deviation
1. Copying exact words from sources without quotation marks	439	1	5	4.39	.839
2. Not giving reference even after taking consent of original author	439	1	5	4.36	.988
3. Paraphrasing words of someone else without citing original source	439	1	5	4.36	.877
4. Copying words from several sources and changing sentences	439	1	5	4.02	1.058
5. Copying from Internet but not citing source	439	1	5	4.20	1.003
6. Word to word translation from other language and presenting work as own	439	1	5	4.25	1.012
7. Some part of own-article used in another article of your own self-plagiarism	439	1	5	3.44	1.228
8. Using a table figure or illustration without acknowledgement	439	1	5	4.28	.870
9. Plagiarism is same as Copyright Act	439	1	5	3.37	1.186
Valid N (listwise)	439				



**Figure1: Plagiarism in Genel**

Total 439 academicians have been responded. It is inferred that, the mean value of all the

variables have got in the range of 4 to 5 except the two variables ie. 1. Some part of own article used in another article of your own is self-plagiarism & 2. Plagiarism is same as Copyright Act. The mean value of these two variables is 3.44 & 3.37 respectively. Hence, it is concluded that there is no significant difference in the perspectives on plagiarism compliance by the academicians.

### Conclusion

- The plagiarism awareness of the academicians is clear; At least 50% at an average academicians are well aware about the plagiarism in general.
- There is no significant difference of opinion about the knowledge of plagiarism.
- There are some academicians taking plagiarism issues very lightly.
- Still there are many academicians not aware about the plagiarism guidelines.
- All higher educational institutions have to be arranged the activities of orientation programs for faculty and students for the awareness of plagiarism issues and ethics.

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## **Digital devices based on Haptic Technology to assist Visually impaired individuals for Navigation**

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**Abstract:-**When movement of a person due to visual impairment is restricted, it is a serious issue to be addressed. Independence is minimum requirement for every person. Basic assistance by cane is not an appropriate solution for this problem. Many digital devices are been designed to solve the assistance problems. Assistance is provided in various areas including navigation, communication, education etc.

In this paper assistance devices based on navigation and communication are reviewed. Various technologies are used to design assistive devices in these fields. This paper concentrates on Haptic technology -based devices. Haptic technology is based on sense of touch; the devices create sensations on skin. Haptic assistive devices can be classified as wearable devices, voice -based devices, wireless devices and non-contact devices.

Some of the devices reviewed in the paper are a navigation belt, a wireless system, and few Electronic Travel Aid (ETAs). Tactile sensations are generated using Haptic sensors or Haptic Transducers to guide the person to reach his destination.

### **1. Introduction**

While making social interactions people follow a strong set of skills that are critical to make good impressions. Social interactions consist of two important communication cues namely (1) Verbal and (2) Non-Verbal [1]. These cues are combined for communications in such a way that differentiation becomes hard. For individuals with visual impairments the non-verbal communications are a challenge.

Non-verbal communications include various cues like Physical environment (i.e. distance of communicator), appearance of person (i.e. clothing), movement of the person etc. Blind persons lack these abilities which create problems for them to communicate. According to a survey conducted to find the need for social communications some interesting facts came to light. The survey stated some key types of non-verbal communication problems as listed below:

- i. Position of people standing around in the environment
- ii. Attention requirements
- iii. Identification of people
- iv. Physical appearance of the people
- v. Changes from previous meeting
- vi. Facial expressions
- vii. Hand gestures
- viii. Behavioural norms and expectations in mannerisms

A device was designed based on audio outputs to meet the above requirements. The design was not practically appropriate for blind people because they rely on their listening capabilities to know their environment and these audio outputs will interrupt their normal hearing. Keeping in mind the limitations for audio output devices, touch enabled devices were proposed.

The recreation of sense of touch by applying forces, vibrations or motion is called as Haptic touch. General application of this technology is in virtual reality or remote control of machines

and gaming [2]. The application pattern is changing by usage of Haptics in assistive devices which is a good social move. Technology has been always used to improve the life style of mankind. Individuals with various impairments require assistance in various aspects. Some of the problems addressed with solution using Haptic devices are reviewed.

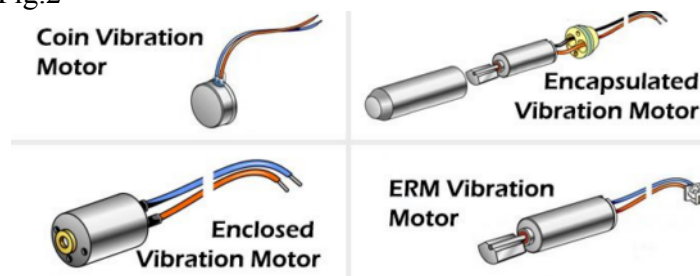
**2. Haptic Devices**

Haptic technology is rapidly growing and allow its user to communicate non -verbally by touching some imaginary objects created by Computer in virtual environments. Many methods are in use to create Haptic sensations. Most important of them are four namely Vibrotactile devices, Force Feedback devices, Surface Displays and Distributed Tactile Displays [3].

**I. Vibrotactile Systems:**

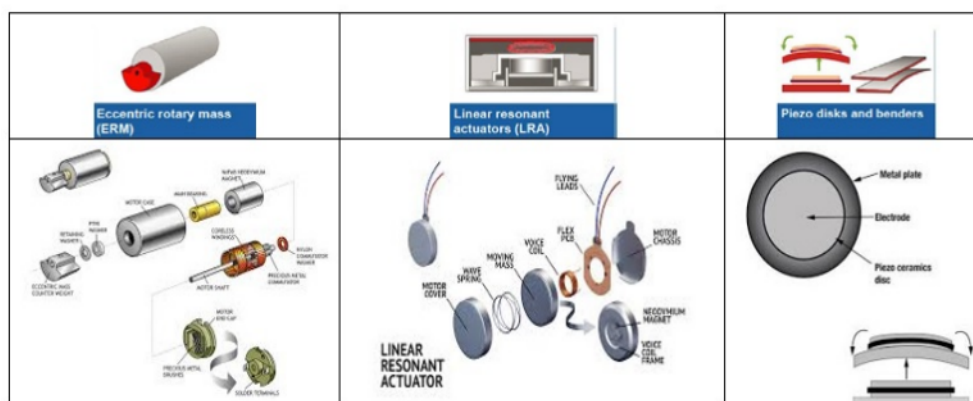
Haptic feedback can be provided by an easiest means named vibrotactile sensations. It's the most widely used system. These sensations provide silent alerts and coded messages of temporal, spatial or ton topic details. Some of the applications could be mentioned as avionics control or sensory tools.

Eccentric Rotating Mass (ERM) [4] actuator shown in Fig.1 is commonly used actuator to create vibrations in most electronic devices. ERM uses haptic feedback. It generally consists of an unbalanced weight attached to a motor shaft. The rotation of shaft causes the actuator and the device attached to vibrate or shake. ERMs are slow, which led to development of other actuators like LRA shown in Fig.2



**Fig 1: Eccentric Rotating Motor**

Linear Resonant Actuator (LRA) [4] shown in Fig.2, is used in devices such as Apple’s MacBook and i Phone. By means of magnetic voice coil, a mass moved in reciprocal manner. Compared to ERMs, response time of LRA is quicker and results in accurate Haptic images. To improve the feedback sensations Piezoelectric Actuators were used.



**Fig 2: Actuators of Haptic Technology**

## II. Force-Feedback Systems:

Force -feedback interface is the second approach [5]. In virtual reality the real object and imaginary stick is replaced using force feedback system of sensors and actuators which are connected to computer. The experience of poking a real object is achieved by measuring the displacement of the tool from first encounter of object and command a motor to supply force feedback.

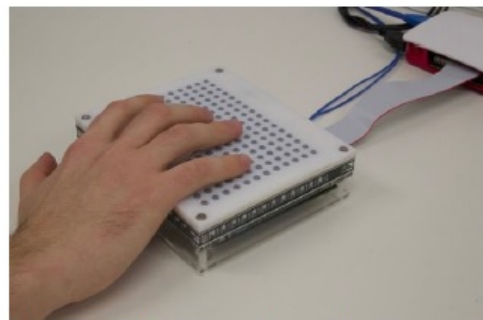
In small platforms, for more precise motion with less noise other actuators like Piezoelectric actuators as shown in Fig.3 are used. Some of the limitations are they are fragile and consume higher voltages when compared to ERM and LRA.



**Fig 3: Piezoelectric Actuator**

## III. Surface Displays:

Artificially produced Haptic sensations can be created by a third category electromechanical device. Sensation of touching an arbitrary surface is observed and is achieved by moving a real surface under control of computer by sensing position of interacting finger. Best example is Blind-Pad [6] as shown in Fig.4, which is an output display for blind users. It comes under distributed tactile displays.



**Fig.4: Blind Pad, an output display**

## IV. Distributed Tactile Display:

Fingertip is the highly sensitive area where spatially distributed sensations are created by using tactile displays [7]. Braille key board is one of the major devices which uses this technology[8]. Information on the monitor is converted as 3D information and displayed, so blind person could know the graphical information on screen.

### 3. Assistive Devices for navigation:

Assistive devices are intended to give solution for problems faced by visually impaired in all aspects [9]. Using Haptic technology assistance is provided in the fields of navigation, communication and education. The devices are categorized as mobile devices and wearable devices. The devices which use wireless technology and are easy to mobilize come under mobile



devices. The devices like Belt, Gloves, Vest, and Bracelet etc. which are wearable come under wearable devices.

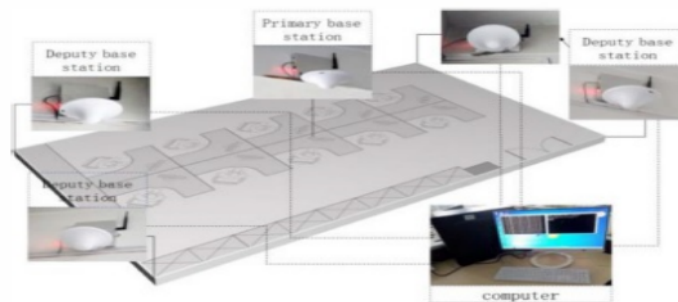
**(i) Mobile Devices:**

The mobile devices are mostly a cane, or a wireless device used to assist visually impaired or old people to navigate with voice response. Various types of cane devices are available in Haptics like Smart Cane [10] as shown in Fig 5, White Cane [11] as shown in Fig 6 and it uses Ultrasonic sensors with an audio feedback, Ultra cane etc. using which user can reach his destination safely. These devices concentrate mainly on navigation and not on communication.



**Fig 5: Smart cane and White cane**

Wireless devices also come under navigation devices [12]. These are mainly applicable to indoor navigation. Since the setup is fixed with a primary base and other deputy base system connecting to a computer. The setup is shown in Fig 7.

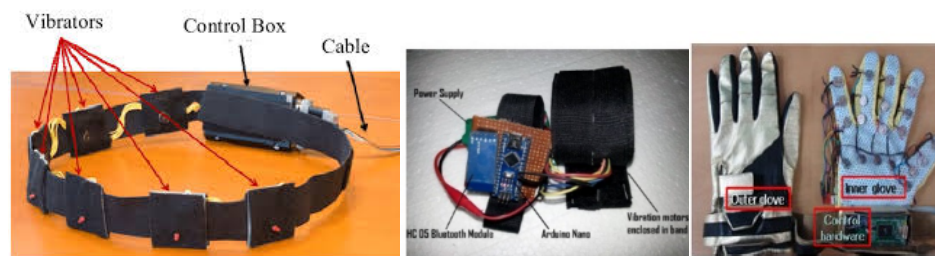


**Fig 7: Hardware environment with fixed primary and deputy base systems**

**(ii) Wearable Devices:**

Belts [13], Gloves [14], Bracelets [9] and Vests [9] come under wearable devices. These devices aid the individuals to navigate as well as communicate. The communication includes non-verbal communications such as facial recognitions, posture recognitions and position recognitions. It is more sophisticated approach for navigation since it covers extra information regarding surrounding environment.

A prototype of Belt is shown in Fig.8; the belt design consists of an electronic compass and 13 vibrators located around the belt.





### Fig 8: A Belt prototype and a Bracelet Prototype and Glove prototype

Haptic Devices are the widely developing technology in various fields. Vest Prototypes as shown in Fig 9 are preferred of all wearable devices because the of more information coverage area.

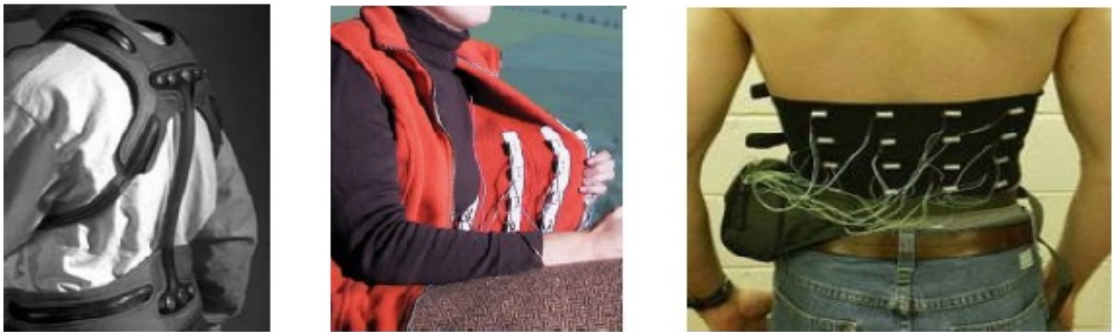


Fig 9: Vest Prototype

#### 4. Conclusion

The conclusion is that electro nomic devices are better choice for assistance in navigation and communications for blind people than classical ways. Haptic technology enhances the quality of assistance because of touch sensors. The review has been made on different digital devices used for assistance by visually impaired and the conclusion is that since touch senses of visually impaired are high Haptic technology is considered as first choice.

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## Effectiveness of Learning Package on knowledge and skill Regarding Cardiopulmonary Resuscitation (CPR) among Final year Nursing students of Yashwant College of Nursing Kodoli

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### ABSTRACT

**The Background of study :-**Cardiac arrest results in the cessation of blood supply to the brain leading to depression of breathing as well. Thus this combination of no breathing and circulation causes generalized is chemia, within 4 - 6 minutes. Cardiopulmonary resuscitation (CPR) is a simple but effective procedure to sustain life. Cardiopulmonary resuscitation involves chest compression, clearing of airway and breathing to normalize blood circulation to the brain and vital organs.

The objectives were

- 1) To assess the knowledge & skill regarding CPR among nursing students.
- 2) To prepare and administer the learning package regarding CPR among nursing students.
- 3) To evaluate the effectiveness of learning package regarding knowledge & skill on CPR among nursing students.
- 4) To find out correlation between knowledge & skill regarding CPR among nursing students.

**Methods:-**An evaluative research approach and Pre experimental, one group pre -test and post -test design was used. Sample & size 60 Nursing students. Setting was from Yashwant college of Nursing, Ko doli. Non-probability Purposive sampling technique. Independent variable was learning package, Dependent variable knowledge of Final Year Nursing students. Data collection structured knowledge questionnaire tool was used. Demographic variables were age, gender, educational qualification.

**Results:-**The pre-test, 06 (10%) had good knowledge, 54 (90%) Final year Nursing students had average knowledge and 0 (0%) had poor knowledge. After the administration of learning package, there was a remarkable gain in knowledge that is 60 (100%) while not a single Final year nursing students had poor knowledge. In the skill scores 07 (11.67%) Final year Nursing students had good skill, majority 53 (88.33%) had average skill, whereas only (0 %) had poor skill on CPR. Where in post test skill scores majority 44 (73.33%) had good, 16 (26.67%) had average scores regarding CPR. Paired 't' test for knowledge scores is 22.72 which revealed that there was a significant gain in knowledge scores of nursing students. where in skill scores is 11.7 which revealed that there was a significant gain in skill scores of Nursing students, after administration of the learning package at  $p < 0.05$ . Interpretation & conclusion pre-test knowledge and skill scores about CPR was average. Learning package was an effective method of teaching Final year nursing students to increase their knowledge and skill regarding CPR. The pre -test study revealed association between knowledge scores and selected demographic variables.

**Keywords:-**Learning package; Cardio-pulmonary resuscitation; Basic life support; knowledge and skill.

**INTRODUCTION:-**The heart is one of the most vital organs in the human body. The heart beats on an average 72 times per minute in an adult. It works 24 hours a day and 7 days a week. Our heart has a simple but important job. It supplies oxygen rich blood to all our body parts. If our heart stops pumping, oxygen does not reach other vital organs and they stop working. The heart is a hollow muscular organ. It is 10 cm and is about the size of one's own fist. It weighs about 225 grams in women and is heavier in men about 310 grams. <sup>2</sup> Cardiac arrest is a common medical emergency with grave consequences. Cardiac arrest occurs when the heart ceases to produce an effective pulse and fails to circulate blood throughout the body. It is manifested by loss of consciousness, and absence of pulse and blood pressure. The high mortality associated with it can be easily prevented most of the time by some very simple maneuvers and skills. Knowledge of BLS and practice of simple CPR techniques ensures the survival of the patient till experienced medical help arrives and in most cases that itself is sufficient for survival.<sup>4</sup>

**NEED FOR THE STUDY :-**A cardiac arrest can occur at anytime and anywhere even when the health care professionals are not available. By the time the patient is shifted to the hospital it may be too late. If family members know how to give a CPR, it can save the life of the person. Only 1/3 of the adults who have an out of hospital cardiac arrest receive timely and appropriate care. <sup>5</sup>

CPR can double or triple the victim's chances of survival when commenced immediately. CPR to be taught to the general public because they are the ones available in the crucial minutes before health care professionals' arrives.<sup>6</sup>

The researcher assumes that structured teaching may provide necessary knowledge and skill to the college students who are brave and enthusiastic to perform a CPR when health care professionals are not available.

Hence the researcher has undertaken a study to determine the effectiveness of learning package on knowledge and skill regarding cardio pulmonary resuscitation among nursing students of Yashwant College of Nursing, Kodoli.

Hence the investigator was interested to assess the knowledge and skill of the nursing student and to develop an informational booklet regarding CPR to improve their knowledge and skill.

#### **OBJECTIVES OF THE STUDY**

- 1) To assess the knowledge & skill regarding CPR among Final year nursing students.
- 2) To prepare and administer the learning package regarding CPR among Final year nursing students.
- 3) To evaluate the effectiveness of learning package regarding knowledge & skill on CPR among Final year nursing students.
- 4) To find out correlation between knowledge & skill regarding CPR among Final year nursing students.

#### **OPERATIONAL DEFINITIONS:**

**Effectiveness:-** It refers to determine the extent to which the learning package has achieved the desired effect as it is measured in terms of gain in post-test knowledge and skill scores of Final year nursing students.

**Learning package:** - It refers to researcher has prepared the audio – visual CD - ROM with the help of guide.

**Knowledge:-** It refers to response using structured knowledge questionnaire received by Final year Nursing students on knowledge regarding CPR.

**Skill:** It refers to demonstration using observational checklist information received by Final year nursing students regarding steps of performing CPR.

**Cardio-Pulmonary Resuscitation:** It refers to a life saving and emergency basic procedure, it is skillfully given compression on sternum to stimulate the heart, and helps to start spontaneous breathing.

**Final year nursing student:** In this study, it refers to the Final year Nursing students of B.Sc. Nursing and GNM studying in Yashwant college of Nursing, Kodoli.

### **ASSUMPTION**

1. The Final year Nursing students have some knowledge and skill regarding CPR.
2. Learning package will increase the knowledge and improve skills regarding CPR and will motivate the students to use their learned knowledge and skills in various settings.

### **HYPOTHESES**

All the hypotheses at 0.05 level of significance:

**H<sub>1</sub>:** The mean post-test knowledge scores will be significantly greater than the mean pre-test knowledge scores of subjects as measured by structured knowledge questionnaire

**H<sub>2</sub>:** The mean post-test skill scores will be significantly greater than the mean pre-test knowledge scores of subjects as measured by observational checklist.

**H<sub>3</sub>:** There will be statistical correlation between knowledge & skill of subjects regarding CPR.

### **DELIMITATION**

The study is limited to the Final year nursing students of Yashwant colleges of Nursing, Kodoli.

### **PROJECTED OUTCOME**

The study will enhance the knowledge & skill of CPR among Final year nursing students.

### **REVIEW OF LITERATURE**

Review of literature is a critical summary of research on a topic of interest generally prepared to put a research problem in context or to identify gaps and weakness on previous studies to justify a new investigation<sup>7</sup> the review of literature is organized into two section. The reviews are collected under the following headings

Section 1: Knowledge and skill of Subjects regarding cardio pulmonary resuscitation.

Section 2: Effectiveness of learning package on knowledge and skill regarding CPR

### **RESEARCH METHODOLOGY**

Research methods are the techniques / methods that the researchers used in performing research operations. Research methodology is the systematic way to solve the research problem. It deals with defining the problem, formulation of hypothesis, methods adopted for data collection and statistical techniques used for analyzing the data with logical reason behind it.<sup>7</sup>

The present study was aimed to assess the knowledge and skill regarding Cardio -Pulmonary Resuscitation (CPR) among Final year Nursing students of Yashwant college of Nursing, Kodoli.

**RESEARCH APPROACH:-**Survey approach can be described as a formal process to observe, describe and document aspects if a situation as it naturally occurs and sometimes to serve as a starting point for hypothesis generation or theory development.<sup>7</sup>

In view of the nature of the problem under study and to accomplish the objective of the study quantitative evaluative survey approach was found to be appropriate.

**RESEARCH DESIGN:-**It helps the researcher in the selection of subjects, manipulation of the independent variable and observation of a type of statistical method to be used to interpret data.

The selection of the design depends upon the purpose of the study, research approach and variables to be studied. The research design used for the present study was pre-experimental, one group pre-test post-test design.

**Symbolic representation of one group pre-test post-test design**

Pre-test	Treatment	Post-test
Day - 1	Day - 1	Day - 7
O <sub>1</sub>	X	O <sub>2</sub>

**Keys-**

O<sub>1</sub>- Measurement of knowledge before administering treatment (Pre-test)

X - Learning package

O<sub>2</sub>- Measurement of knowledge after administering treatment (Post-test)

**VARIABLES UNDER INVESTIGATION:-**Research variables are concepts at various levels of abstraction that are measured, manipulated and controlled in a study.<sup>7</sup>

**Independent Variables (IV) :-**Independent variable is the variable that stands alone & does not depend on any other. It was presumed cause of action. In this study, learning package on Cardio-Pulmonary Resuscitation (CPR) was the independent variable.

**Dependent Variables (DV) :-**Dependent variables are the effect of action of the independent variable and cannot exist by itself.<sup>15</sup> In the study dependent variables are knowledge and skill of final year nursing students.

**Attributed Variables (AV):** Seasons characteristics, which include age, gender, education.

**RESEARCH SETTING:-**Setting is the physical location and conditions in which data collection takes place.<sup>15</sup> The study was conducted in Yashwant college of Nursing, Kodoli . The setting was chosen on the basis of feasibility in terms of availability of the subjects who were nursing student; and studying in Final year Nursing.

**TARGET POPULATON OF THE STUDY:-**A population is a group whose members possess specific attributes that a researcher is interested in studying.<sup>7</sup>

In the present study population was final year nursing students studying in Final year of B.Sc. Nursing and GNM at Yashwant college of Nursing, Kodoli.

**SAMPLE AND SAMPLE SIZE:-**A finite subset of the population selected from it with the objective of investigating its properties is called as sample. The sample for the present study consisted of 60 Final year of B.Sc. Nursing and GNM Nursing students.



**SAMPLING TECHNIQUE:** -Sampling is a process of selecting a group of people, events or portion of the population to represent the population.

The non-probability purposive sampling technique was used for the present study. In the present study 60 sample were chosen from Yashwant college of Nursing, Kodoli.

**CRITERIA FOR SELECTION OF SAMPLES:** -The criteria for defining the population and selecting the samples is based on cost, practical concern, people's ability to participate in a study and design consideration. The study involves selection criteria as follows:

**INCLUSION CRITERIA**

The Students who were

- i. Present at the time of data collection.

**EXCLUSION CRITERIA**

The Students who were

- i. Not willing to participate in the study.

**DATA COLLECTION TECHNIQUE:**

**DEVELOPMENT OF TOOL:** -The tool is the vehicle that could obtain data pertinent to the study and at the same time adds to the body of general knowledge in the discipline. Selection and development of the tool was done based on the objectives of the study. After an extensive review of literature and the discussion with the guide & experts, a 'structured knowledge questionnaire and observational check list' on Cardio pulmonary resuscitation (CPR) was developed.

The steps carried out in preparation of tool were:

1. Discussion with authority of Yashwant College of Nursing and Nursing students.
2. Literature review.
3. Discussion with the experts in the field of nursing.
4. Validity of the tool.

**Description of tool-**The tool consists of

**Structured knowledge questionnaire and observational check list which contains:**

**Section A:** Socio demographic data containing 3 items.

**Section B:** 40 items on Structured Knowledge Questionnaire and 15 items on Observational check list on Cardio pulmonary resuscitation (CPR).

**Part I :** General cardiothoracic system, like Anatomy and physiology of heart and respiratory system.

**Part II:** Structured Knowledge Questionnaire on CPR

**Part III:** Observational check list on CPR

**Description of learning package**

The learning package is a programmed educational material which has in build exercise which the nursing students can use for self -evaluation. It also has a glossary section to help nursing students, in case they find any difficulty in understanding terms. It aids nursing students in enriching their knowledge and boost confidence in them. Learning package used in the present study consists of CD- ROM which includes;

**1. Introduction**

**2. Section - I** : General Cardiothoracic system

- Anatomy & Physiology of heart.
- Anatomy & Physiology of respiratory system.

**3. Section –II** : Cardio pulmonary resuscitation (CPR)

**Procedure for Data collection** :-The research investigator took formal permission from respective authority and Class coordinators and Final year nursing students of Yashwant College of Nursing Kodoli to collect data for main study.

Planning of time schedule for data collection was done. Each subject was taken into confidence and assured of confidentiality of their responses. Informed consent was obtained from each subject. The average time taken for data collection was approximately 1 hour. The main study was conducted in Yashwant College of Nursing, Kodoli from 2/3/2020 to 12/3/2020.

**Pre-test:-**The structured knowledge questionnaire and observational check list was administered to assess the knowledge and skill of Nursing students on CPR. Total numbers of items were 55. 40 items on Structured Knowledge Questionnaire which administered to all 60 Final year Nursing students on date 02/03/2020 and 15 items on Observational checklist administered to 30 Final year Nursing students on date 3 /3/2020 and for remaining 30 Final year Nursing students on date 4 /3/2020 .Each correct item carried score of '1' and each incorrect answer a score of '0'.Administered learning package to the subjects on same day after pre-test.

**Post-test:-**The post-test was conducted 7 days after the pre -test by using the same structured knowledge questionnaire and observational check list. 40 items on Structured Knowledge Questionnaire which were administered to all 60 Final year Nursing students on date 9/03/2020 and 15 items on Observational checklist were administered to 30 Final year Nursing students on date 10 /3/2020 and for remaining 30 Final year Nursing students on date 11/3/2020.

**Data Analysis :-**The analysis of data is the most skilled task in the research process. It calls for the researcher own judgment and skill. For the present study the data obtained were analyzed in respect to the objectives of the study using descriptive and inferential statistics. The plan for data analysis was developed under the excellent direction of the experts in the field of nursing and biostatistics.

The plan of the data analysis was as follows:

I.Organizational of data on the master sheet.

II.Tabulation of data with descriptive statistics to compute frequency, percentage, mean, median, mode, standard deviation and range to describe the data.

**III.Classification of knowledge score.**

- |                  |                 |
|------------------|-----------------|
| Good scores -    | Above (27-40)   |
| Average scores - | Between (14-26) |
| Poor scores -    | Below (0-13)    |

**Classification of skill score.**

- |                     |                |
|---------------------|----------------|
| Good skill scores - | Above (11-15)  |
| Average score -     | Between (6-10) |
| Poor score -        | Below (0-5)    |

IV. Use of inferential statistics that is paired 't' test and Karl Pearson's coefficient of correlation to draw the conclusion. This chapter on research methodology has thus described about the various activities carried out and planned by the researcher during the course of his dissertation. Through structure knowledge questionnaire and observational checklist regarding knowledge and skill regarding Cardio-Pulmonary Resuscitation (CPR) among Final year Nursing students of Yashwant college of Nursing, Kolhapur. The present study was designed to assess the knowledge and skill regarding Cardio-Pulmonary Resuscitation (CPR) among Final year Nursing students of Yashwant college of Nursing, Kodoli. Collected data were recorded, organized, analyzed and interpreted by using descriptive and inferential statistics.

#### Presentation of data

The data obtained were entered into a master data sheet for tabulation and statistical analysis of data was organized and presented under the following headings.

**Section I:** Findings related to selected demographic variables of Final year nursing students.

**Section II:** Findings on the knowledge scores regarding CPR among Final year nursing students.

**Section III:** Findings on the skill scores regarding CPR among Final year nursing students.

**Section IV:** Testing of hypothesis for the evaluation of effectiveness of learning package.

**Section V:** Findings describing correlation between knowledge and skill scores of Final year nursing students.

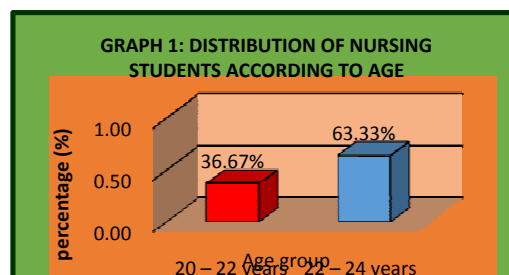
**Section I: Findings related to selected demographic variables of Final year nursing students.**

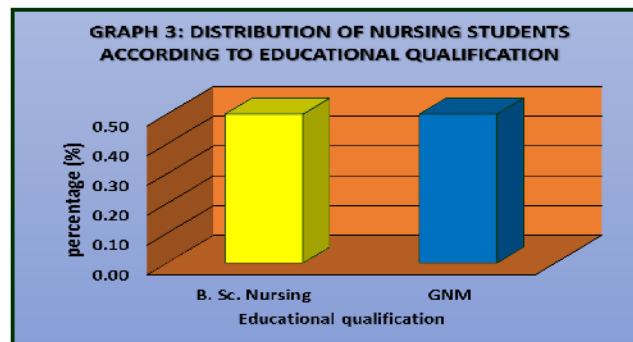
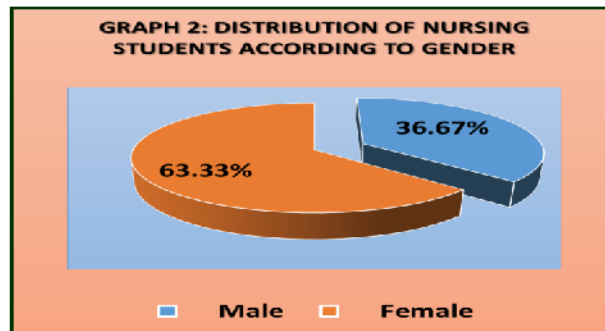
**Table 1: Frequency and percentage distribution of nursing students according to their selected demographic variables**

n=60

Demographic variables		Frequency (f)	Percentage %
1) Age	a) 20 – 22 years	22	36.67%
	b) 22 – 24 years	38	63.33 %
2) Gender	a) Male	22	36.67%
	b) Female	38	63.33 %
3) Educational qualification	a) B. Sc. Nursing	30	50.00%
	b) GNM	30	50.00%

The data presented in table no 1 indicates that maximum 38 (63.33 %) of Nursing students belonged to the age group of 22 – 24 years, while minimum number 22 (36.67%) of Nursing students belonged to the age group of 20 – 22 years, In gender maximum number of Nursing students 22 (36.67%) were female. In educational qualification both G.N.M and B.Sc. Nursing students were equal 30 (50.00%).





**Section II: Findings on the knowledge scores regarding CPR among Final year Nursing students.**

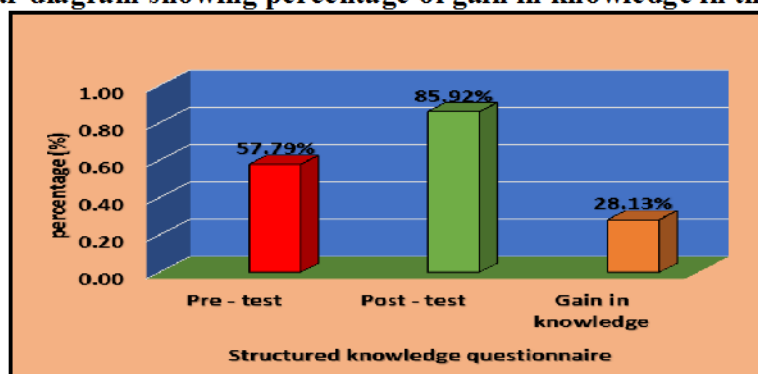
**Table 2: Pre-test and post-test mean percentage scores of knowledge of Final year Nursing students regarding CPR.**

n=60

Items	Mean percentage of knowledge scores of Final year Nursing students			
	Total score	Pre-test (X)	Post-test (Y)	Gain in knowledge (Y-X)
Structure Knowledge Questionnaire	2400	57.79%	85.92%	28.13%

Table No. 2 Indicates that the percentage of gain in knowledge in the area of CPR was (28.13%).

**Graph-4: The bar diagram showing percentage of gain in knowledge in the area of CPR**



**Table 3: Mean, median, mode, standard deviation and range of knowledge score of Final year nursing students on CPR.**

**n=60**

Area of analysis	Mean	Median	Mode	S.D.	Range
Pre-test (X)	23.11	23	26	2.72	9
Post-test (Y)	34.36	35	36	2.49	8
Difference (Y-X)	11.25	12	10	0.23	1

Table No.3 depicts that the overall knowledge score of Nursing students was increased by mean difference 11.25 units and median was 12 whereas mode difference was 10. The variability around the mean of knowledge score distribution was decreased by 0.23 units. The range between the highest and lowest score was decreased by 1 units after administering the learning package

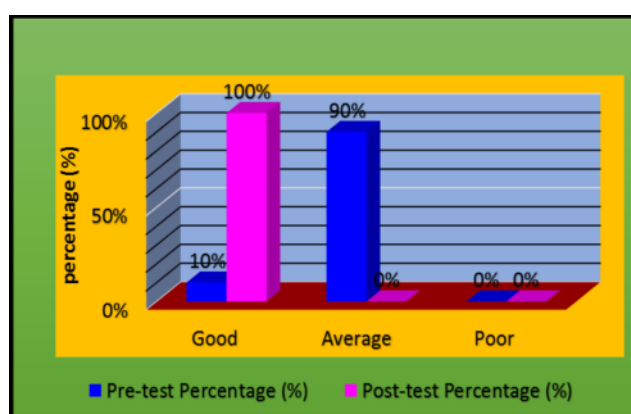
**Table 4: Distribution of overall gain in Knowledge scores of Final year Nursing students on CPR**

**n=60**

Knowledge score	Pre-test		Post-test	
	Frequency (f)	Percentage (%)	Frequency (f)	Percentage (%)
Good (27-40)	06	10.00	60	100.00
Average (14-26)	54	90.00	0	0
Poor (0-13)	0	0	0	0

Table No. 4 reveals that in the pre-test 6 (10%) of subjects had good knowledge and 54 (90.00%) of subjects had average knowledge, while no one 0 (0%) had poor knowledge regarding CPR. In post-test indicates that all 60 (100%) of subjects had good knowledge on CPR. Which reveals apparently that the learning package was effective method in increasing the knowledge of Final year nursing students on CPR.

**Graph 6: Bar diagram showing knowledge scores regarding CPR among Final year nursing students.**



Section III: Findings on the skill scores regarding CPR among Final year nursing students.

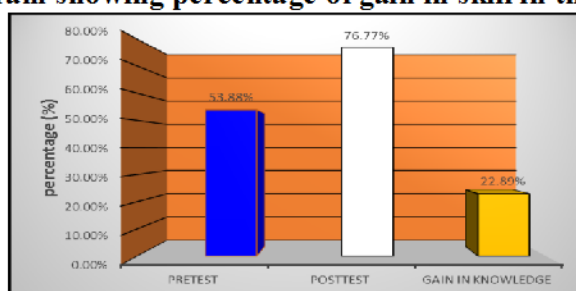
**Table 5: Pre -test and post -test mean percentage scores of skill of Final year Nursing students regarding CPR.**

n=60

Items	Mean percentage of knowledge scores of Nursing students			
	Total score	Pre-test (X)	Post-test (Y)	Gain in skill (Y-X)
Observational checklist	900	53.88%	76.77%	22.89%

Table No. 5 Indicates that the percentage of gain in skill in the area of CPR was (22.89%).

**Graph-7: The bar diagram showing percentage of gain in skill in the area of CPR**



**Table 6: Mean, median, mode, standard deviation and range of skill score of Final year Nursing students on CPR.**

n=60

Area of analysis	Mean	Median	Mode	S.D.	Range
Pre-test (X)	8.08	8	7	1.39	7
Post-test (Y)	11.51	12	12	1.32	6
Difference (Y-X)	3.43	4	5	0.07	1

Table No.6 depicts that the overall skill score of Nursing students was increased by mean difference 3.43 units and median was 4 whereas mode difference was 5. The variability around the mean of skill score distribution was decreased by 0.07 units. The range between the highest and lowest score was decreased by 1 units after administering the learning package.

**Table 7: Distribution of overall gain in skill scores of Final year Nursing students on CPR.**

n=60

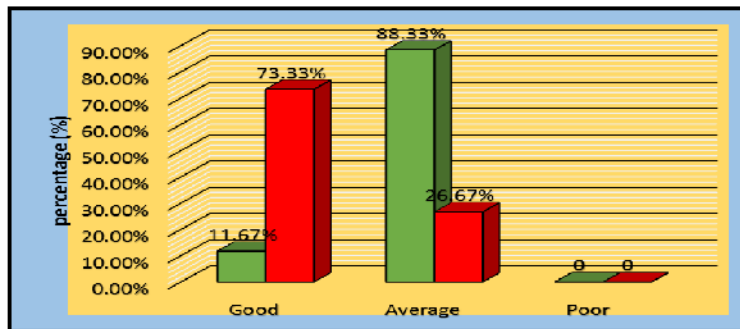
Knowledge score	Pre-test		Post-test	
	Frequency (f)	Percentage (%)	Frequency (f)	Percentage (%)
Good (11-15)	07	11.67	44	73.33
Average (6-10)	53	88.33	16	26.67
Poor (0-5)	0	0	0	0

Table No. 7 reveals that in the pre-test 7 (11.67%) of subjects had good skill and 53 (88.33%) of Nursing students had average skill, while no one 0 (0%) had poor skill on CPR.

In post-test 44 (73.33%) of subjects had good skill and 16 (26.67%) of subjects had average skill, while no one 0 (0%) had poor skill regarding CPR. Which reveals apparently that the learning package was effective method in increasing the skill of Final year Nursing students on CPR



**Graph 8: Bar diagram showing skill scores regarding CPR among Final year Nursing students.**



**Section IV Testing of hypothesis for the evaluation of effectiveness of learning package.**

**H<sub>1</sub>:** The mean post-test knowledge scores is significantly greater than the mean pre-test knowledge scores of subjects as measured by structured knowledge questionnaire at 0.05 level of significance.

**Table No. 8: Mean difference (d), standard error of difference (S.Ed) and paired't' values of knowledge scores of Nursing students.**

Mean difference (d)	Standard difference (S.Ed)	Paired 't' values		df
		Calculated	Tabulated value	
17	0.46	22.72*	2.00	59

n=60

\*p<0.05

Table No. 8 reveals that calculated paired 't' value (22.72) was greater than tabulated value (1.960). Hence H<sub>1</sub> was accepted. This indicates that the gain in knowledge score was statistically significant i.e. H<sub>1</sub>: μ ≠ μ<sub>0</sub> at 0.05 level of significance.

Therefore, the findings revealed that the learning package regarding CPR was an effective in gaining the knowledge of Nursing students.

**H<sub>2</sub>:** The mean post-test skill scores is significantly greater than the mean pre-test knowledge scores of subjects as measured by observational checklist at 0.05 level of significance.

**Table No. 9: Mean difference (d), standard error of difference (S.Ed) and paired't' values of skill scores of Nursing students.**

Mean difference (d)	Standard error difference (S.Ed)	Paired 't' values		df
		Calculated	Tabulated value	
7.36	0.26	11.7*	2.00	59

n=60

\*p<0.05

Table No. 9 reveals that calculated paired't' value (11.7) was greater than tabulated value (1.960). Hence H<sub>2</sub> was accepted. This indicates that the gain in skill scores was statistically significant i.e. H<sub>2</sub>: μ ≠ μ<sub>0</sub> at 0.05 level of significance.

Therefore, the findings revealed that the learning package regarding CPR was an effective in gaining the skill of Nursing student

### Section V: Findings describing correlation between knowledge and skill scores regarding CPR.

**H<sub>3</sub>:** There is statistical correlation between knowledge & skill of nursing students regarding CPR at 0.05 levels of significance.

**Table No. 10: Correlation between knowledge and skill scores of nursing students regarding CPR.**

**n=60**

X	Y	Karl pearson's co efficient of correlation (r <sub>xy</sub> )
162.14	95.05	0.50 (0<r <sub>xy</sub> <+1) Positive correlation.

Table no. 10 reveals that  $(r_{xy}) = 0.50$  ( $0 < r_{xy} < +1$ ), hence there is positive correlation between variables of knowledge and skill, hence H<sub>3</sub> was accepted

## DISCUSSION

### Findings related to selected demographic variables of Final year Nursing students

In the present study, a sample size of 60 Final year Nursing students studying in Yashwant College of Nursing, Kodoli were taken.

The findings showed that, out of 60 Nursing students, majority of Final year Nursing students 38 (63.33%) belonged to the age group of 22 to 24 years whereas minimum 22 (36.67%) belonged to the age group of 20 to 22 years.

The number of male and female nursing students, included in the study were maximum number of Final year Nursing students 38 (63.33%) were females and minimum number of Final year Nursing students 22 (36.67%) were males.

The Final year Nursing students 30 (50%) had G.N.M. educational qualification and remaining 30 (50%) had B. Sc. Nursing educational qualification.

These findings are similar to the study of P. A Venugopal study to assess the knowledge and skill regarding cardiopulmonary resuscitation (CPR) among nursing student in Narayana Hrudayalaya College of Nursing at Bangalore with a view to develop an information booklet.<sup>8</sup> The result shows that Majority of Final year Nursing students 71% belonged to the age group of 22 to 24 years whereas minimum 19 % belonged to the age group of 20 to 22 years. The number of male and female nursing students, included in the study were maximum number of Final year Nursing students 78% were females and minimum number of Final year Nursing students 15 % were males. Most of the Final year Nursing students 59 % had G.N.M. education and minimum 20% had B. Sc. nursing education.

### Findings related to knowledge scores of Final year Nursing students on CPR.

In the knowledge scores 06 (10%) Final year Nursing students had good knowledge, majority 54 (90%) had average knowledge, whereas no one had poor knowledge on CPR. Where in post test all 100% had good knowledge scores regarding CPR.

These findings are comparable to the study of Manjunath M. Beth study to evaluate the effectiveness of planned teaching programme on knowledge and skill regarding cardiopulmonary resuscitation (CPR) among 2<sup>nd</sup> year baccalaureate nursing student studying in KLE's institute of nursing sciences Hubali, Karanataka.<sup>9</sup> The result shows that in pre test the level of knowledge

majority 72.5% had average, 20% Final year Nursing students had good, whereas only 7.5% had poor knowledge regarding CPR. Where in post test knowledge majority 95% had good, 5% Final year Nursing students had average, whereas no one had poor knowledge regarding CPR.

**Findings related to skill scores of Final year nursing students on CPR.**

In the skill scores 07 (11.67%) Final year Nursing students had good skill, majority 53 (88.33%) had average skill, whereas no one had poor skill on CPR. Where in post test skill scores majority 44 (73.33%) had good, 16 (26.67%) had average scores regarding CPR.

These findings are comparable to the study of Manjunath M. Beth study to evaluate the effectiveness of planned teaching programme on knowledge and skill regarding cardiopulmonary resuscitation (CPR) among 2<sup>nd</sup> year baccalaureate nursing student studying in KLE's institute of nursing sciences Hubali, Karnataka.<sup>9</sup> The result shows that in pre test the level of skill majority 67.5% had average scores, 25% Final year Nursing students had good scores, whereas only 7.5% had poor skill scores regarding CPR. Where as in post test skill majority 95% had good, 5% Final year nursing students had average, whereas no one had poor skill regarding CPR.

**Findings describing correlation between knowledge and skill scores of nursing students.** In the present study there was positive correlation (0.50) knowledge and skill variables. These findings are comparable to the study of Manjunath M. Beth study to evaluate the effectiveness of planned teaching programme on knowledge and skill regarding cardiopulmonary resuscitation (CPR) among 2<sup>nd</sup> year baccalaureate nursing student studying in KLE's institute of nursing sciences Hubali, Karnataka.<sup>9</sup> The result shows that there was positive correlation (0.085) knowledge and skill variables.

**CONCLUSION**

Based on the findings of the study the following conclusions were drawn.

1. Overall pre-test knowledge about CPR was average.
2. There was a need of learning package for Final year Nursing students on CPR
3. Post test results showed significant improvement in the knowledge scores on CPR. Thus, it can be concluded that learning package is an effective method of teaching Final year Nursing students to increase their knowledge about CPR.
4. The pre-test study revealed correlation between knowledge and skill variables.

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[URL:http://www.DSpace%20at%20RGUHS%20University%20%assess the %20knowledge and skill regarding %20%cardiopulmonary resuscitation %20\(CPR\) among nursi%0ng student in Narayana H%0rudayalaya%2020% College of Nursing at Ban%20%galore with a v%0iew to develop an inform%0ation booklet.html](http://www.DSpace%20at%20RGUHS%20University%20%assess%20the%20knowledge%20and%20skill%20regarding%20%cardiopulmonary%20resuscitation%20(CPR)%20among%20nursi%0ng%20student%20in%20Narayana%20H%0rudayalaya%2020%20College%20of%20Nursing%20at%20Ban%20%galore%20with%20a%20view%20to%20develop%20an%20inform%0ation%20booklet.html)

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## EFFECTIVENESS OF MUSIC INTERVENTION ON PAIN DURING DRESSING AMONG BURN PATIENTS ADMITTED IN BURN ICU.

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**Abstract:**-The management of pain is one of the primary issues in burn care. The painful sensation experienced by a burns patient is aggravated by the changing of wound dressings procedures. Music is an important tool which distracts patient's attention and decrease their HR and breathe rate. The aim of the study is to assess the effect of music intervention on pain during dressing among burn patients in burn ICU. Quantitative approach & experimental (cross-over) research design was used for the study. Total enumerative sampling technique was used for 2 months to draw the sample from the target population. The study was conducted on 20 patients in Burn ICU of DMC& Hospital, Ludhiana, Punjab. Pain Assessment Sheet as per Wong-Baker Pain Rating scale will be used for data collection. The data analysed by using descriptive & inferential statistics. The conclusion and discussion made according to the findings of the study and comparing the results of the present study with the previous literature.

**Keywords:** - music intervention, dressing, pain intensity, vital parameters, burn patients.

**Introduction :** The estimated annual burn incidence in India is approx. 6-7 million per year, based on data from major hospitals, which is the 2nd largest group of injuries after road accidents.<sup>1</sup>Burns to the skin are classified by the depth of injury to the tissues, which is additionally one among the most important predictors of prognosis.<sup>2</sup>Pain is the most frequently used nursing diagnoses in burns unit.<sup>3-4</sup> The American Burns Association annual meeting reported that the research category of "pain/ anxiety/ patient comfort" was the third most popular research area in burns management.<sup>5</sup>The American Pain Society coined the phrase "Pain: The 5th Vital Sign" (Campbell,1995) to stress its significance and to extend the notice among health care professionals of the importance of effective pain management.<sup>6</sup>Pain is an unpleasant sensory and emotional experience associated with or expressed in terms of actual or potential tissue damage. The amount of pain experienced by adults with burn injury appeared to be associated with long term post-traumatic stress and general emotional distress. The painful sensation experienced by a burns patient was aggravated by the changing of wound dressings procedures. Dressing is a painful and discomforting sensation, and is fearful unpleasant procedure.<sup>7</sup>All the professionals involved in the care for patients with burns, nurses are the one most confronted with phenomenon of pain. Nurses often find themselves during a paradoxical position, having to wash and dress wounds so as to stop infection and promote healing, while knowing that the change of dressing procedure causes pain despite the administration of analgesics. In a typically burns unit, it is a challenge for all staff to ensure patients are able to tolerate pain well during procedures.<sup>8</sup>

Non-pharmacological interventions have been recognized as valuable and inexpensive alternative or adjuvant to pharmacologic approaches to pain management. The standard treatments discussed above do provide relief for patients, daily dressing changes are still

tremendously painful and stressful. Music therapy has been shown to have a moderate ability at reducing pain and could be utilized as adjunctive therapy to the methods currently used in practice.<sup>9</sup> The music intervention is one of such non pharmacological treatment which can be used to relieve procedural pain for like during positioning, dressing etc. <sup>8</sup>Music therapy is a simple, inexpensive and reliable intervention which can applied in intensive care patients without risk of unwanted side effects.<sup>9</sup>

Music is an important tool which distracts patient's attention and decrease their HR, Temperature and breathe rate. <sup>10</sup>Research indicates that music creates balance between mind, body and soul, has positive effects on pain and anxiety, and increase quality of life of sick or healthy people. <sup>11</sup>It results in slower heart rate, calmer and more regular rate of respiration. It also affects cardiac, respiratory or peripheral oxygen saturation ranges. Evidence state that brain waves can be accelerated or decelerated with coordination of muscle tension and movements, <sup>10</sup>the non-pharmacological methods such as music therapy and other methods can be effective in reducing heart rate and amount of needed drugs. Studies have shown that music can affect brain waves, brain circulation, and stress hormones.<sup>8</sup>

Nowadays music intervention is commonly used as a non-pharmacological measure for pain management in the ICUs.<sup>12</sup> However in our country, the use of music as a nursing intervention is quite rare and moreover the impact of music therapy on pain or vital signs related to dressing has remained unexplained till now.

Music intervention as a treatment intervention that supports traditional medicine is used as a non-invasive treatment method for patients in the ICU. However, use of music, as a nursing intervention, is quite rare in our country. Music is a component of normal life which will be easily adapted for the requirements of individual patients and their current environment while providing a way for self-expression and for normalizing the environment. The management of pain is one among the first issues in burn care. Pain isn't only a physiologic experience, but a psychological one also. Cognitive, behavioural, and pharmacological interventions all have a role in pain management. Studies, also as clinical experience, have shown that musical intervention has been helpful during assisting patients with pain management in a sort of medical settings.<sup>8</sup>

In case of pain relief, music therapy goes beyond comfort by playing musical instruments and singing soothing songs for the patients. In this study, however, patients were only given audio music (with no vocals) to concentrate to from a compact disk player. This is different from the work of music as an alternative non-pharmacological intervention to reduce the painful experience for burns patients during dressing. Most of the studies recommended taking note of music concurrently with pain relieving drugs. This may further help to decrease the level of pain the patient's experience. <sup>8</sup>Thus music interventions can be used as an effective measure for the treatment of pain among burn patients during dressing. Hence this study will assess the effectiveness of music as an alternative non-pharmacological intervention to reduce the painful experience for burn patients during dressing.

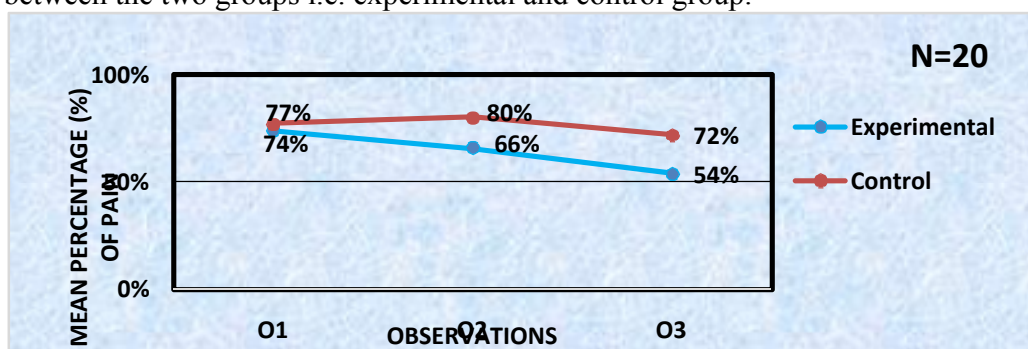
**Material and methods:** With quantitative approach, Experimental (cross-over) design was used for this study conducted on 20 patients in burn ICU of DMC & H, Ludhiana, Punjab. Total enumerative sampling technique was used to draw the sample from the target population based on inclusion and exclusion criteria. Pain assessment sheet as per Wong-Baker Faces Pain Rating Scale was used for data collection. Pain intensity was assessed at the beginning of the dressing,



within each patient was observed for three times for each method, i.e., a total of 9 assessments for each patient, while the order of the methods was determined alternatively for each patient.

**RESULTS**

Majority of the patient i.e. 6(30%) burn patients were falling in age group 18 -31 years, 13(65%) were male, rural area people are more in risk than urban people,12(60%) were illiterate,13(65%) were married,12(60%) were vegetarian, 12(60%) belongs to nuclear family, 12 (60%) were non -working, 11(55%) were suffering from flame burn, 11 (55%) were in 25.0 -29.9 BMI,5(25%) were having injuries in upper extremities,lower extremities, back of the patient and front side of the patient,11(55%) were having both second and third degree burn injuries,7(35%) were having TBSA between 20% -40%, 11(55%) were not taking any analgesic drugs prior to dressing, 12(60%) were not having any previous history of hospitalization. The findings of the present study reveals that statistically significant results were found in pain intensity within the groups as well as between the groups. Within experimental group (p=0.00) and in control group (p=0.00) and between the two groups i.e. experimental and control at O<sub>2</sub> (p=0.00) and in O<sub>3</sub> (p=0.00). As per comparison of vital parameters there were statistically significant results were found in heart rate only between experimental group and control group in O<sub>2</sub> (p= 0.001) and in O<sub>3</sub> (p=0.028), in SpO<sub>2</sub> between the two groups i.e. experimental and control group in O<sub>2</sub> (p=0.00) and in O<sub>3</sub> (p=0.008) and no statistically significant results were found in respiratory rate within and between the two groups i.e. experimental and control group.



**Fig: Comparison of mean percentage of pain intensity among burn patients during dressing in between experimental & control group in O<sub>1</sub>, O<sub>2</sub>, O<sub>3</sub>.**

**Table: Comparison of pain intensity among burn patients undergoing dressing in experimental and control group in O<sub>1</sub>, O<sub>2</sub>, O<sub>3</sub> within the groups and between the groups.**

**N=20**

Pain Intensity Observations	Groups				Mean difference	Paired t/p Value
	Control group		Experimental group			
	Mean±SD	Mean %	Mean±SD	Mean %		
O <sub>1</sub>	7.70±0.333	77%	7.40±1.603	74%	0.300	t=1.831 df=19 p=0.083 <sup>NS</sup>
O <sub>2</sub>	8.00±1.298	80%	6.60±1.465	66%	1.400	t=5.480 df=19

						p=0.000***
O <sub>3</sub>	7.20±1.196	72%	5.40±1.729	54%	1.800	t=6.282 df=19 p=0.000***
ANOVA F/p value within the groups	F=1.8363 df=59 p=0.1658 <sup>NS</sup>		F=7.8907 df=59 p=0.0009***			

**Table-** illustrates the comparison of pain intensity of burn patients among Experimental and Control group in O<sub>1</sub>, O<sub>2</sub>, O<sub>3</sub> within the groups and between the groups. Incontrol group mean of pain intensity in O<sub>1</sub> was 7.70±0.333, in O<sub>2</sub> was 8.00±1.298 and in O<sub>3</sub> was 7.20±1.196 while in experimental group, mean of pain intensity in O<sub>1</sub> was 7.40±1.603, in O<sub>2</sub> i.e. 6.60±1.465 and in O<sub>3</sub> .i.e. 5.40±1.729. There was a significant decrease in the mean percentage of pain intensity from 74% to 66%% to 54% in experimental group while in control group the mean percentage of pain intensity in O<sub>1</sub> is 77% which has increased in O<sub>2</sub> .i.e. 80% and dec reased in O<sub>3</sub> .i.e. 72%. Hence, statistically significant results were found in pain intensity within experimental group (p=0.00) and between the two groups i.e., experimental and control at O<sub>2</sub> (p=0.00) and in O<sub>3</sub> (p=0.00) Thus, null hypothesis (H<sub>0</sub>) is rejected. i.e.,

**DISCUSSION:-**The findings of the present study have been discussed in accordance with the objectives of the study and previously reviewed studies. Review of literature enlighten that there are vast number of studies conducted on patients undergoin g dressing and various pain minimizing strategies used to reduce the pain experienced by the patients during dressing. Evidence based practice is the integration of best research evidence with clinical expertise and patient values which when applied by pra ctitioners will lead to improve outcome. It is an ongoing and continuous process. In nursing care services also, we continuously strive for improving standards of care. Music interventionaffected pain intensity on burn patients duringdressing. With the hel p of comparison of experimental and control group by using pain rating scale tool, we will able to find which one is best for reducing pain during dressing. This chapter deals with the discussion for the findings of study titled “A study to assess the effectiveness of music intervention on pain during dressing among burn patients admitted in burn ICU of a selected tertiary care hospital, Ludhiana, Punjab.”

The research was conducted on 20 subjects who are divided into 2 groups i.e. experimental and control groups by using crossover design. Music therapy given to the subjects by using Wong - Baker Faces Pain Rating Scale during dressing. This study concluded that music therapy was effective in pain reduction during dressing. The findings of the present study sho wed that the mean pain scores of the two groups.Incontrol group mean of pain intensity in O<sub>1</sub> was 7.70±0.333, in O<sub>2</sub> was 8.00±1.298 and in O<sub>3</sub> was 7.20±1.196 while in experimental group, mean of pain intensity in O<sub>1</sub> was 7.40±1.603, in O<sub>2</sub> i.e. 6.60±1.465 and i n O<sub>3</sub> .i.e. 5.40±1.729. There was a significant decrease in the mean percentage of pain intensity from 74% to 66%% to 54% in experimental group while in control group the mean percentage of pain intensity in O<sub>1</sub> is 77% which has increased in O<sub>2</sub> .i.e. 80% and decreased in O<sub>3</sub> .i.e. 72%. The findings of the present study reveals that statistically significant results were found on pain intensity during dressing

within experimental ( $p=0.0009$ ) and between the two groups i.e., experimental & control groups during dressing in  $O_2$  ( $p=0.00$ ) and  $O_3$  ( $p=0.00$ ).

**CONCLUSION:-**This study concluded that there is significant improvement in pain intensity among the burn patients who have received music intervention during dressing. Music intervention affected pain intensity on burn patients during dressing.

#### **Conflict of Interest**

None

#### **Source of Funding**

Self

**Ethical Clearance :-**The research study was approved by research and ethical committee of Hospital and University. The subjects were explained about the objectives and activities of research projects. Instructions were given to them and they were assured that their responses would be kept confidential by providing information sheets and informed consent was obtained from the patients

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## HIP BIOMECHANICS AND A STUDY OF VARIOUS FORCES ACTING ON HIP JOINT

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**Abstract:** The hip joint is one of a kind physiologically, anatomically, and formatively; in this manner understanding the fundamental structure and biomechanics of the hip is basic for Engineers, Orthopedic surgeons, specialists, physiotherapists and clinicians alike. Powers following up on hip appeared by different scientists are talked about. Furthermore, joint kinematics of the hip is likewise talked about to some degree. In this survey we layout the capacity of the key anatomical segments of the hip and talk about the important related biomechanical issues. The paper closes with short outline of biomechanics of hip joint for the plan and change of hip substitutions. Exhibit papers give a review of the current natural and biomechanical information on the hip.

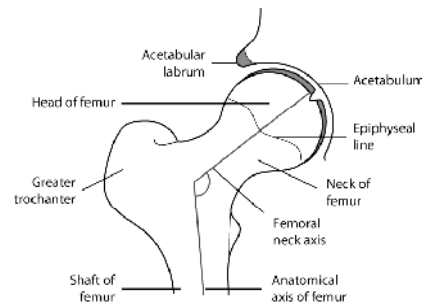
**Keywords:** biomechanics, free body diagram, Hip joint, anatomy.

**1 Introduction :-** Research of biomechanics of human hip joint is begun in the nineteenth century when Julius Wolff delineated the connection between the internal structure of the bone and the external practical stacking. A long time later Friedrich Pauwels examined the biomechanics of joint stacking, enabling him to make model of hip joint load. His exploration alluded to different joint positions and their effect on muscle powers identified with them [17]. Biomechanics is exploration of research and investigation of the mechanics of living beings and the utilization of fundamental designing mechanics standards. Estimations of the hip joint contact region, joint load and stress are imperative to streamline the joint treatment and recuperation of patients. In this paper, an assurance of the resultant force on human hip joint is exhibited. Hip biomechanics is helpful in outlining the ideal treatment of the sick hip joint and in addition the restoration procedure. The present paper gives an overview of the current biomechanical information on the hip joint. In biomechanics, the mechanics part should be clarified in detail by drawing the free body outlines of human joint and get condition of equation of equilibrium to determine obscure joint forces. From the hip geometry, we can clear various forces on joint and how they follow up on the hip joints as for reference planes. [4]. For the most part, because of the way that hip joint is pivotal overemphasized joint in human body because of its primary part in conveying bodyweight.

**2 Anatomy of the Hip:** -The hip joint is a synovial joint shaped by the articulation of the rounded head of the femur and a cup-like acetabulum of the pelvis. The hip is a classical ball-and-socket joint. It shapes the essential connection between the bones of the lower limb and the pivotal skeleton of the trunk and pelvis.

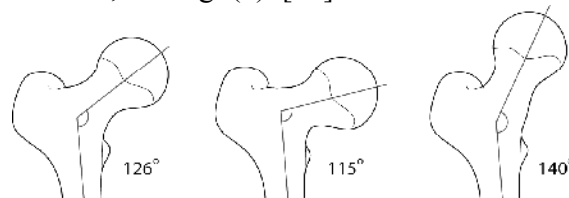
Both joint surfaces are secured with a solid, yet greased up layer, called articular hyaline cartilage. It meets the four attributes of a synovial or diarthrodial joint: it has a joint depression; joint surfaces are secured with articular cartilage; it has a synovial film creating synovial liquid, and; it is encompassed by a ligamentous case [15].

## 2.1 Bony Anatomy



**Fig. (1).** Cross-sectional view of the normal hip joint.[10].

The head of the femur associated femoral shaft by the femoral neck, which fluctuates long contingent upon body size of human the neck-shaft point is typically  $125 \pm 5^\circ$  in the ordinary grown-up, with coxa-valga being the condition when this esteem surpasses  $130^\circ$  and coxa-vara, when the inclination is under  $120^\circ$ , see Fig. (2). [10].



**Fig. (2).**(a) Normal femoral neck point, (b) a diminished femoral neck edge (coxa vara), and (c) an expanded femoral neck edge (coxa valga). [10].

**3 Hip Joint Biomechanics:** -Hip Joint Biomechanics: The fundamental objectives of biomechanics are to compute the contact territory for various exercises and loads happening in the bones and muscles of a human body.

Folloing techniques are utilized for computing the loads in human m usculoskeletal joint framework

- i. Free Body diagram of hip Joint and principle of Biomechanics:
- ii. Implant based strategies.
- iii. Scientific/Mathematical models in light of electromyography (for determining muscle reaction forces).
- iv. Scientific/Mathematical models of human movement, utilizing enhancement strategies to recognize muscle forces. [15].

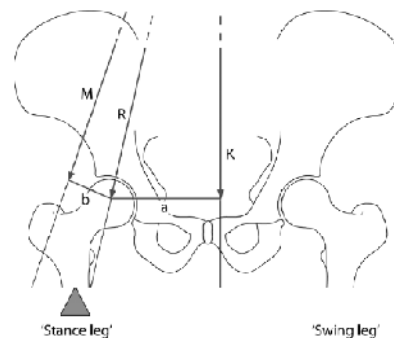
**3.1 Two -Dimensional Analysis of Joint:** -In two dimensional analysis the fundamental methodologies is to adjust forces and moments acting about the hip joint can be helpful in assessing the impacts of changes in joint anatomy or diverse treatment alterations on the hip joint reaction force [10]. The static loading of the hip joint has been approximated with a streamlined, two dimensional investigation performed in the frontal plane.

At the point when the weight of the body is being borne on the two legs, the focal point of gravity is focused between the two hips and its force is applied similarly on the two hips. For these loading conditions, the weight of the human body minus the weight of two legs is upheld similarly on the femoral heads, and the resultant vectors are vertical. [10].

In a solitary leg position, the centre of gravity moves distally and far from the supporting leg

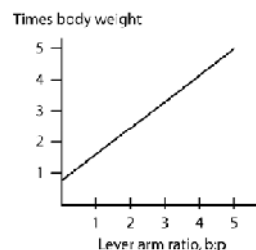
since the nonsupporting leg is presently ascertained as a major aspect of the weight following up on the weight-bearing hip (see Fig. 3). This descending force applies a turning movement around the focal point of the femoral head – the moment is made by the body weight, ( $K$ ), and its minute arm,  $a$  (remove from femur to the focal point of gravity). The muscles that oppose this movement are counterbalanced by the joined abductor muscles, ( $M$ ).

The force of the abductor muscles additionally makes a moment around the focal point of the femoral head; however this moment arm is significantly shorter than the effective lever arm of body weight. Therefore the combined force of the abductors must be a multiple of body weight . [10].



**Fig. (3).** Free-body diagram for the calculation of the hip joint force while walking, where  $K$  is the body weight (minus the weight bearing leg),  $M$  is the abductor muscle force, and  $R$  is the joint resultant.[10]

The estimation of the force depends fundamentally on the lever arm proportion, it is the proportion between the body weight moment arm to the abductor muscle moment arm ( $a:b$ ) [10]. Run of the mill levels for single leg position are three times bodyweight, relating to a level proportion of 2.5. Increment in the lever arm proportion, builds the abductor muscle force required for gait and thusly the power on the head of the femur also (see Fig. 4). Individuals with short femoral necks have higher hip forces, All the more essentially individuals with a wide pelvis additionally have bigger hip forces. Women have bigger hip forces than men in light of the fact that their pelvis must suit a birth channel [10]. In spite of the fact that reviews don't generally indicate sexual orientation contrasts in the biomechanics of running, especially continuance running [10]. That women have moderately more hip cracks and hip activity force.[10].



**Fig. (4).** Impact of lever arm proportion on the hip joint response compel, adapted from Greenwald [15].

**Table 1. Hip Contact Forces Measured In Vivo in Patients with Instrumented Implants. Adapted from Johnston *et al.* [10]**



Activity	Typical Peak Force (BW)	Total No. of Patients	Time Since Surgery (Months)
Walking, slow	1.6-4.1	9	1-30
Walking, Normal	2.1-3.3	6	1-31
Walking, Fast	1.8-4.3	7	2-30
Jogging, running	4.3-5	2	6-30
Ascending stairs	1.5-5.5	8	6-33
Descending stairs	1.6-5.1	7	6-30
Standing up	1.8-2.2	4	11-31
Sitting Down	1.5-2	4	11-31
Knee Bend	1.2-1.8	3	11-14
Stumbling	7.2-8.7	2	4-18

**3.1.1.1 In Vivo Measurements of Joint Forces:** -From above table it is observed that, Walking transmits significant body weight to the hip joint, while running, jogging and physical games produce forces essentially more prominent. To confirm the assessments of hip joint forces made utilizing free-body calculations, numerous in vivo estimations have been done by past researcher using prostheses and endoprostheses instrumented with transducers (strain gauges). Rydell was the first to endeavor estimating direct hip joint powers utilizing an instrumented hip prosthesis, which yielded drive extents of 2.3 to 2.9 times body weight for single leg position and 1.6 to 3.3 times body weight for level walking. More broad investigations have as of late been completed, which are compressed in Table 1. These investigations have demonstrated that in spite of the fact that patients in the early postoperative period can execute arranged exercises of day by day living with moderately low joint contact forces, surprising occasions, for example, stumbling or periods of instability during single leg position can create resultant forces more than eight times body weight [10].

**4 Conclusion:** -Hip biomechanics is very useful in planning the treatment, rehabilitation of diseased hip joints, by using principles of biomechanics we can calculate joint reaction force for various activities like walking, jogging by using various methods of analysis. Out of these strategies, the upsides of mathematical modeling over direct estimation is making it conceivable to think about substantial gathering of hips and the most exact and precise technique for figuring hip joint force is the implant based one. From fig no.4 increments in lever arm proportion additionally builds the abductor muscle compel and therefore the force on the head of the femur. Short femoral necks have higher hip forces. Individuals with a wide pelvis additionally have bigger hip forces., implies that women have bigger hip forces than men on the grounds that the wider pelvis must oblige a birth waterway [10]. In spite of the fact that reviews don't generally demonstrate sexual orientation contrasts in the biomechanics the advance saw in the innovation from numerous years may show on facilitate improvement in the field of biomechanics of hip joint, and in addition its prosthesis outline. The advancement in the field of biomechanics could change the state of prosthesis outlined biomaterials and biocomposite materials utilized for prosthesis. This is the reason, Engineers, clinician, physiotherapist and orthopedic specialist's center around this subject in the current scholastic works.

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## HPLC Method development for estimation gallic acid and ellagic acid in an Ayurvedic Anti arthritic formulation Simhnad Guggul

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**Abstract:** Present study is a work on results of analytical method development for two important bioactive phyto-constituents of a well-known Ayurvedic formulation Simhnadguggul i.e. gallic acid and ellagic acid. TLC method was used for authentication of these constituents in formulation. Then HPLC methods were developed for quantification of gallic acid and ellagic acid in formulation. The optimized mobile phase for gallic acid was Acetonitrile: water (70:30) and 3% Glacial acetic acid and for ellagic acid it was Acetonitrile: water (80:20) and 1% Glacial acetic acid. The method was applied on market formulations and freshly prepared one. The results indicate that developed methods were found to be precise, sensitive, reliable and accurate.

**Key words:** Simhna dguggul, HPLC, gallic acid, ellagic acid

### 1. Introduction

Simhnadguggul [commonly known as *Sinhnadguggul* or *Sinhnadgugal*] is a very popular and effective Ayurvedic anti arthritic formulation suggested by Ayurvedic texts in any type of arthritic patient. According to Ayurvedic formulary of India; it is made up of *Commiphoraweightii* resin, purified Ganddhak [sulfur], *Terminaliabaheda* pericarp, *Terminaliachebula* fruits and *Embelicaofficinalis* fruits. The formulation needs purification of Guggul resin and raw sulfur by reported traditional methods of shodhana. [1-3] Preparation method [Castor oil is used for final rolling]. The formulation type is guggulvati [traditionally prepared pills]. It is suggested to be taken 4 to 12 in divided dose with warm milk orally. [3-5]

### 2. Literature review

Sunita, et. Al., [4] reported SimhnadGuggul to have significant improvement in open label 2 Multicenter study of Simhnadguggul and BrihatSaindhavyataila in management of Rheumatoid Arthritis on 111 human volunteers for 12 weeks. Singhal H. K., et. Al. [5] studied comparative effect of Singhnadguggulu and Trayodasangaguggulu for treatment of rheumatoid arthritis - Juvenile (amavata) on 10 patients with 2mg/Kg dose p.o. 45 days. Mahto R. R., et. al. [6] reported clinical study results of RasonaRaso nadighanvati and Simhnadguggul in 101 amavata patients. Pandey S. A., et. Al. [7] Studied comparative clinical effects of Simhnadguggul and Shiva guggulu on Amvata (rheumatoid arthritic) patients. Sumantran V.N., et. al. [8] they studied chondroprotective effect of Trifala guggul and triphala&Shodhitaguggul on the basis of total hyluronidase enzyme content. DebnathSaroj Kumar, et. Al. [9] reported clinical study of 90 Rheumatoidarthritic patients under treatment of AlambushadiChurna and SimhNadguggul with warm milk, thrice a day, orally for 45 days. Rasool M, et. al. [10] reported anti -arthritic effect of Triphalachurna using Adjuvant Induced Arthritis model in mice (1gm/Kg) in comparison with Indomethacin. Shruthi S. D., et. Al. [11] studied anti -arthritic effect of Ellagic acid in formaldehyde induced paw edema for 4 weeks treatment in human at 100 and 250µg/ml doses in vivo, in vitro and in silico. Allam G., et. Al. [12] anti arthritic effect of ellagic acid was studied in vivo in adjuvant Induced Arthritic mice with 1 week of pre-treatment and 3 weeks of simultaneous treatment with ellagic acid on Adjuvant Induced Arthritis model. Allam G. also did study of mechanism of ellagic acid in Adjuvant Induced Arthritis in mouse at 700mg/Kg dose (p.o.). Bensaad L. A. et. Al. [13] found potential anti-inflammatory effect of gallic acid, ellagic

acid and punicalagin A/B in isolated Frozen RAW264.7 cells at 200 µg/mL doses. Kroes B. H., et. Al. [14] Studied in vitro anti inflammatory and anti oxidant activities of gallic acid in zymosan induced acute food pad swelling in mice. Debnath S. K., et. Al. [15] analyzed Simhnadguggul formulation using TLC technique and found 7 phytoconstituents in 254 nm and 8 phytoconstituents in 366 nm.

### 3. Materials and methods

#### 3.1 Raw Materials Procurement and authentication

The raw materials (dried enrite herb parts) for the formulations were procured in crude forms from LallubhaiVrajLal Gandhi store, Ahmedabad. *Embelicaofficinalis* fruits procured from same place was authenticated by Morphological, microscopical characters, extractive values and Ash value. *Terminaliabelerica* pericarps were procured from same place was authenticated by Morphological, microscopical characters, extractive values and Ash value. *Terminaliachebula* fruits were also purchased from Lallubhai store and after removal of foreign matter authenticated by Morphological, microscopical characters, extractive values and Ash value. ShuddhaGandhak was procured from Shree Narayan Ayurvedic Pharmacy, Ahmedabad, and was authenticated by its Chemical test, Limit test and sulphated ash value. ShuddhaGuggulu was purchased from LallubhaiVrajlal [LVG] store and was authenticated by Morphological characters, extractive values and Ash value. The study of powdered herbs were done by examining stained and unstained powder slides under 10x and 45x magnification using student microscopes. GuggulShodhana[Purification], GandhakShodhana[purification] and Preparation of SimhNadGuggul<sup>[AFI, API]</sup> was done according to Ayurvedic Formulary of India.

PARAMETERS	MF1	MF2	MF3	H. F.	L. F.
<b>Name</b>	Sihnadgugul	Sinhanadgugul	Sihnadguggulu	Simhnadguggul	Simhanadguggul
<b>Reference</b>	BhaishajyaSamhit	BhaishajyaRatnavali (P-444)	Ayurvedic Formulary of India	Ayurvedic Formularyof India	Ayurvedic Formularyof India
<b>Formulation</b>	Coated tablet	Uncoated tablet	Coated Tablet	Coated vati	Vati
<b>Indication</b>	Sandhivata, Ashmari, Shool, Prameh, Amlapitta.	Amavata, Anaemia, Rectal prolapsed, Elephantitis.	Aamvata, vatarakta (arthritis & Gout)	Vata, Shool	Arthritis
<b>Dose</b>	1 to 2 tablet with water.	2 to 4 tablets with warm water / day	1 or 2 tablets twice a day after meal	1 to 2 tablets with warm water.	1 to 2 tablets with warm water.
<b>Quantity</b>	25 gms.	120 tablets	80 tablets	500 gms.	-
<b>Prize</b>	40 Rs.	90 Rs.	145 Rs.	Not for sale	Not for sale
<b>Manuf. license</b>	GA/19	Ayu/157	1800/89	-	-
<b>Shelf life</b>	3 years	Not mentioned	5 years	Not mentioned	3 years
<b>Manufactured by</b>	<b>Shree Narnarayan Ayurvedic Pharmacy,</b> Ahmedabad	<b>AushadhiBhavan,</b> AyurvedSevaSangh, Ganeshwadi, Nashik	<b>Shree Baidyanath</b> AyurvedBha wanpvt.Ltd., Gwalior road, Jhansi-284003	<b>Manibai Civil Ayurvedic Hospital,</b> Ahmedabad	Department of Pharmacognosy, L. M. College of Pharmacy

**Table 1 Simhnad guggul samples details**

#### 3.2 TLC authentication of gallic acid, Ellagic acid and catechin in Simhnadguggul

Stationary phase: Silica gel G (ready plates of 0.2 mm thickness)

Spotting solution: Spotting solution: Gallic acid (1mg/5 ml) in methanol. Ellagic acid (1mg/5 ml) in methanol, Catechin 1mg/10 ml in methanol

Test extract: Lab formulation was defatted with ether and dried. Dried content was then subjected to extraction with methanol and filtered extract was concentrated for spotting.

Band width: 10 mm, Run distance: 8 cm, Chamber saturation time: 15 min.

Temperature: 25°C, Lab room humidity considered 30-35 % w/w (measured by psychrometer)

Mobile Phase for gallic acid and ellagic acid Toluene: Ethyl acetate: Formic acid (2:2.25:0.5)

Mobile phase for ellagic acid Toluene: Ethyl acetate: Formic acid (2:2.25:0.5)

Mobile phase for catechin; Toluene: Ethyl acetate: Glacial acetic acid (5:5:1)

Derivatization: For catechin; 10 % ethanolic Potassium Hydroxide (pink purplish red spot) Or UV 365 nm. For Gallic acid and Ellagic acid: 10 % alcoholic Ferric chloride solution (freshly prepared)

**3.3 HPLC method for estimation of gallic acid in Simhnadguggul** :-As per reported method solvents for mobile phase were selected; acetonitrile (ACN), water (demineralized LC grade H2O), methanol (MeOH - AR grade) and Glacial acetic acid (GAA). All formulations [MF1, MF2, MF3, HF, LF] and standard gallic acid in methanol were studied for the chromatographic behavior in following solvent systems.

Different proportions of mobile phases used were;

Acetonitrile: water (70:30), Acetonitrile: water (80:20), Acetonitrile: water (20:80), Acetonitrile: water (70:30 + 3% Glacial acetic acid), Acetonitrile: water (55:45), Acetonitrile: water (60:40).

Post solvent system development and drying was followed by detection at Short UV or by derivatization using 10% alcoholic Ferric chloride solution.

### 3.3.1 Instrumentation and chromatographic conditions

System: SHIMADZU HPLC with UV/PDA detector

Stationary Phase: Column was Phenomax Luna C18 (250 mm × 4.6 mm × 5 μm) ; LC - 10AS Shimadzu solvent delivery module with isocratic solvent delivery system.

Auto sampler: Shimadzu, (100 μl) injector, syringe 25 μl. The optimized mobile phase was Acetonitrile: water (70:30) and 3% Glacial acetic acid. The flow rate of mobile phase was kept 1.0 ml/min. Injection volume 10 μL and 10 min total run time initial for checking extra contour later all study was done till 8 min run time. Detector: SPD - 10A Waters PDA Detector was run by Waters software. Wavelength selected for detection was 255 nm. Peak identity was confirmed by spectrum and retention time comparison with respective reference standards. All the analysis was performed at 25°C temperature.

**3.3.2 Preparation of standard solutions for calibration curve:** -Stock solution of standard Guggulosterone E in methanol (1 mg/mL) was prepared. From that stock solution 10, 20, 40, 60, 80, 100 μl were diluted up to 1 ml with methanol and injected to have concentrations 10, 20, 40, 60, 80, 100 μg/ml.

**3.3.3 Formulation treatment and preparation of extract:** All the Lab formulation (LF), Market formulations (SNG MF1, SNG MF2, SNG HF), were accurately weighed 0.5 gm and each were dissolved in methanol 2 ml. The mixtures after sufficient sonication were filtered by cartridge in to HPLC vials and making it to final volume with methanol. Final solution was injected for estimation with injection Volume: 10.00 μl. Run Time: 10 minutes.

**3.3.4 Validation:** -For checking linearity of the method, peak area were measured at concentrations 10,20,40,60,80 and 100 μg/ml concentrations for n=3 and on the bases of graph of AUC plotted against concentration. The regression equation was determined and was used for test extract concentration calculation. Interday and Intraday precision was studied as per ICH guidelines and peak area for 20, 40 and 60 μg/ml concentrations (n=3) were recorded followed by calculation of coefficient of variance. Repeatability of scanner was studied at 40μg/mL concentration having RSD < 1 % based on seven times measurement of the same peak of single injection. Reproducibility of sample application was studied at 40μg/mL concentration having RSD < 3% based on application of seven injections. Limit of detection was observed at signal to noise ratio of 3:1. Limit of quantification was determined at signal to noise ratio of 10:1.



### 3.4 HPLC method development and validation for ellagic estimation in SimhnadGuggul :-

As there was no specific  $R_f$  value difference in gallic acid and ellagic acid analyzed by TLC/HPTLC method, so HPLC method was chosen for identification and estimation of ellagic acid. All the marketed, lab formulations were used in filtered extract form to check their behavior in chromatographic instrument under following conditions.

#### 3.4.1 Instrumentation and chromatographic conditions

**Stationary Phase:** Column was Phenomax Luna C18 (250 mm × 4.6 mm × 5 μm); LC - 10AS Shimadzu solvent delivery module with isocratic solvent delivery system.

**Auto sampler :** Shimadzu, (100 μl) injector, syringe 25 μl. The optimized mobile phase; Acetonitrile: water (80:20) and 1% Glacial acetic acid. The flow rate: 1.0 ml/min. Injection volume 10 μL and 10 min total run time initial for checking extra contour later all study was done till 8 min run time. Detector: SPD - 10A PDA Detector was run by Shimadzu software. Wavelength selected for detection was 255 nm. Peak identity was confirmed by spectrum and retention time comparison with respective reference standards. All the analysis was performed at 25°C temperature.

**3.4.2 Preparation of standard solutions for calibration curve:** -Stock solution of standard ellagic acid in methanol (1 mg/mL) was prepared using methanol. From that stock solution 10,20,40,60,80,100,120,140 μl were diluted up to with 1 ml methanol and injected to have concentrations 10,20,40,60,80,100, 120 and 140 μg/ml.

**3.4.3 Formulation treatment and preparation of extract:** All the Lab formulation, Market formulations (SNG MF1, SNG MF2, SNG MF3), were accurately weighed 0.5 gm and each were dissolved in methanol 2 ml. The mixtures after sufficient sonication were filtered by cartridge in to HPLC vials. Final solution was injected for estimation with injection Volume: 10.00 μl. Run Time: 8 minutes.

**3.4.4 Validation:** For checking linearity of the method, peak area were measured at concentrations 20,40,60,80, 100 and 120 μg/ml concentrations for n=5 and on the bases of graph of AUC plotted against concentration followed by regression equation determination. Interday and Intraday precision was studied as per ICH guidelines and peak area for 20, 40 and 60 μg/ml concentrations (n=3) were recorded followed by calculation of coefficient of variance. Repeatability of scanner was studied at 40μg/mL concentration having RSD < 1 % based on seven times measurement of the same peak of single injection. Reproducibility of sample application was studied at 40μg/mL concentration having RSD < 3% based on application of seven injections. Limit of detection was observed at signal to noise ratio of 3:1. Limit of quantification was determined at signal to noise ratio 10:1 of the instrument.

## 4. Results and Discussion

**4.1 Identification and Authentication of Crude Drugs :-**Alcohol extractive value [by cold extraction method WHO guideline] for dried amla fruits, baheda pericarps and harde fruits were found 14.8, 12.04 and 17.66 % w/w. Water extractive value for dried amla fruits, baheda pericarps and harde fruits were found 12.28, 8.75 and 8.22 % w/w. All drugs are found to be authentic in quality. They don't appear aged or rotten or tanned or covered by micro-organisms. Extractive values of individual herbs are within the range prescribed in Indian Pharmacopeia 2008. Triphala powder needed further confirmation for authenticity, so powder microscopy was studied.

**4.2 TLC authentication results in Simhnadguggul :-**A thin band at 0.65  $R_f$  without tailing, band broadening and merging with no spot reflects that solvent system is most appropriate. TLC results show that catechin and ellagic acid are present Simhnadguggul formulations. Each



compounds in formulation show single separated band with slight broadening without interference. Catechin is with no tailing and no band broadening, while ellagic acid band is with little tailing due to excess spotting incorporation. The HPTLC method can't be developed with optimized solvent system as both compounds catechin and ellagic acid come at same  $R_f$  thus making them impossible to quantify separately. Retention factor of catechin was found 0.4 and for ellagic acid it as 0.48.

**4.3 HPLC method result for gallic acid in Simhnad Guggul:-**Gallic acid did not show complexity in measurement, except the solutions were older than a day. All the method development, validation and estimations were done using freshly prepared solutions of standard gallic acid and test extracts. HPLC chromatogram of gallic acid in extract in figure reflects retention time 2.776 minute with absolute symmetry and no interference. Tailing factor was found  $<1$  (0.904) with peak purity index 0.9677. UV overlaid spectra of test extracts and standard gallic acid have superimposable spectra with same  $\lambda_{max}$  (250 nm  $\pm$ 0.5nm)

**Validation Results for Gallic acid:** Linearity graph of F.3 shows linearity with 0.996 regressions between 40 to 100  $\mu$ g/ml concentration ranges. Method linearity equation is mentioned in graph. Accuracy results of the method are shown in terms of % recovery which indicated that method is accurate with % recovery of gallic acid (in test extract plus standard gallic acid) between 97.643 to 99.7956 and RSD between 0.187 to 0.7078 range. Repeatability of the method for scanning single peak seven times at 50  $\mu$ g/ml concentrations was found repeatable with co-efficient of variance 1.2089 ( $<2$ ). Method was also found of reproducibility for (n=7) sample application with appropriate co-efficient of variance; 1.7597. Method precision study results of Table T. showed method to be precise for intraday trials with co-efficient of variance less than 1. Method is not only precise intraday but also interday. Interday variations also affect the method to less extent having co-efficient of variance between 0.8884 to 1.3020 ( $<1.5$ ). Method for gallic acid estimation in methanolic extract of Simhnadguggul formulation was found appropriate by HPLC method. The method had limit of detection 10  $\mu$ g/ml and limit of quantification 20  $\mu$ g/ml. Method is sensitive, precise, accurate, repeatable, reproducible and economical. As the peak of gallic acid in HPLC chromatogram was found symmetrical and pure (without interference and tailing) proved that the method is very specific too.

**4.4 HPLC method result for ellagic acid in SimhnadGuggul :-**Solvent system trial results; Acetonitrile: water (70:30) at 1 ml/min flow rate showed single peak 2.64 minute time with slight tailing. With peak purity index  $>0.88$  and Tailing factor: 1.44 HPLC chromatogram in Figure F.2 show symmetrical peak with slight tailing but with no interference of other constituents in test extract.

**Validation Results for Ellagic acid:** -The method showed linearity between concentration ranges of 20 to 100 $\mu$ /ml of ellagic acid in methanol. Linearity was measured for concentration 10 to 120  $\mu$ g/ml concentration for n=3. Co-efficient of variance was found lowest 0.5674 and highest 1.5512. Repeatability and reproducibility results of Table 1 have shown co-efficient of variance  $<2$  means tolerable reproducibility. The method was found to be precise for intraday precision study with co-efficient of variance between 0.5273 and 0.7407. The method was found to be precise for interday precision with co-efficient of variance between 1.0853 and 1.4156, ultimately below 2. Method for ellagic acid estimation in Simhnadguggul formulation using HPLC technique was found linear with 0.99 r value and specific. Method was found repeatable, reproducible, precise, accurate and sensitive with limit of quantification 10 $\mu$ g/ml. Method needed solvents, basic apparatus and ideal chromatographic conditions. Recovery study results for this method were found appropriate (Table T.3) that % recovery was found above 98% of

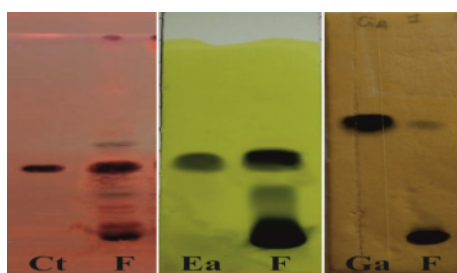
actual concentration in test extract of the formulation. Co-efficient of variance for accuracy study have shown results between 0.1926 and 0.5196.

Results are calculated as average for  $n=3$  + standard deviation. Ellagic acid being one of the important hydrolysable tannin with great anti-oxidant potential been found with permissible limits in all the formulations. Repeatability of scanner at same wavelength for same peak, seven times have shown co-efficient of variance 0.4045 (less than 1). Reproducibility of the method was studied for sample application seven times keeping scanning wave length and concentration ( $60\mu\text{ml}$ ) same.

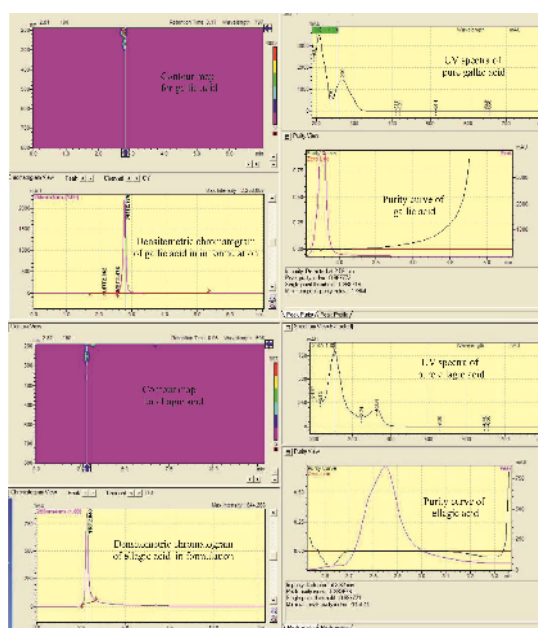
**4.5 Yield of Gallic acid and Ellagic acid in formulations** :-Gallic acid yield depends on presence of pseudo tannin in formulation, it immediately degrades in presence of oxygen or metal if kept in form of solution for more than a day. So all the extracts were freshly prepared and all the formulations were found to have nearly same content of gallic acid. Ellagic acid being one of the important hydrolysable tannin with great anti-oxidant potential been found with expected limits in all the formulations.

## 5. Figures and Tables

### 5.1 Figures



**Figure 1** TLC result of std. gallic acid [GA] Catechin [CT] and Ellagic acid [EA] in alc. extract of SimhnadGuggul formulation [F]



**Figure 2** HPLC study results for gallic acid and ellagic acid

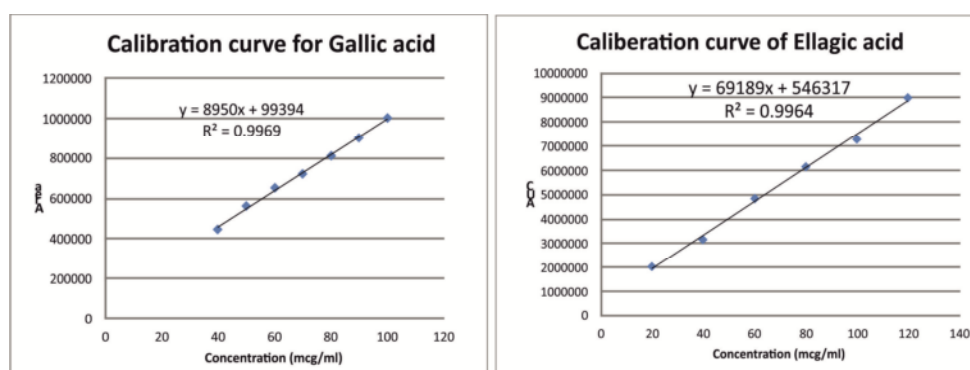


Figure 3 Linearity graph for gallic acid and ellagic acid

5.2 Tables

Table 2 Repeatability and reproducibility results

	Ellagic acid		Gallic acid	
	Repeatability	Reproducibility	Repeatability	Reproducibility
	4814318	4787482	559416	554416
	4789245	4813375	545723	539411
	4780465	4842096	561023	542767
	4801668	4776158	557869	530189
	4770465	4630125	547162	549701
	4810086	4782560	560152	530888
	4764523	4597852	549138	532746
average	4790110	4747093	554354.71	540016.86
Standard deviation	19378.04	94080.83	6701.9538	9502.9509
co-var	0.4045	1.9818	1.2089	1.7597

Table 3 Intraday and Interday precision study results

		Conc. µg/ml	1	2	3	Avg.	std. dev.	co-var.
Gallic acid	Intrada	50	564263	560751	567621	564211.7	3435.288	0.6088
		60	649126	652459	659924	653836.3	5529.194	0.8456
		70	718862	721428	731426	723905.3	6638.253	0.9170
	Interda	50	560456	562246	571726	564809.3	6056.503	1.0723
		60	648236	652459	659715	653470	5805.898	0.8884
		70	716256	720456	734266	723659.3	9422.634	1.3020
Ellagic acid	Intrada	40	3126692	3145986	3163407	3145362	18365.46	0.5838
		60	4792482	4813375	4843026	4816294	25398.15	0.5273
		80	6060014	6104820	6150456	6105097	45221.63	0.7407
	Interda	40	3110782	3145986	3182045	3146271	35632.35	1.1325
		60	4762753	4813375	4867241	4814456	52252.39	1.0853
		80	6024347	6104820	6197164	6108777	86476.43	1.4156

Table 4 Recovery study results

Ellagic acid	Test µg/ml	STD µg/ml	Actual µg/ml	Average AUC (n=3)	Std. dev.	Co-var.	Conc. (µg/ml)	% Recovery
	44.6335	20	64.6335	4478928	16705.03	0.3729	63.9450	98.9349
	44.6335	40	84.6335	5908776	11380.29	0.1926	84.6109	99.9733
	44.6335	60	104.6335	7166839	37241.72	0.5196	102.7939	98.2418
Gallic acid	Test Conc. µg/ml	Std	Total Conc.	Avg AUC (n=3)	std. dev.	Co-var	Practical Conc.	% recovery
	36.33	16	52.33	556708.6	3940.663	0.7078	51.0966	97.6430

36.33	32	68.33	709698	1329.383	0.1873	68.1903	99.7956
36.33	48	84.33	851937.3	1665.471	0.1954	84.083	99.7071

**Table 5-Validation result summary**

Parameters	For Gallic acid	For Ellagic acid
Linearity range	40 to 100 µg/ml	20 to 140 µg/ml
Correlation co-efficient	0.996	0.996
Repeatability	1.2089	0.4045
Reproducibility	1.7597	1.9818
Interday	0.8884-1.3020	1.0853-1.4156
Intraday	0.6088-0.9170	0.5273-0.7407
Accuracy (% recovery)	97.6430-99.7956	98.2418-99.9733
Limit of detection	10 µg/ml	5 µg/ml
Limit of quantification	20 µg/ml	10 µg/ml
Limit of Linearity	100 µg/ml	140 µg/ml
Specificity	specific	specific

**Table 6-Yield of gallic acid and ellagic acid**

	Total Gallic acid (% w/w)	Total Ellagic acid (% w/w)
MF1	0.9836 ± 0.0108	0.4009 ± 0.0009
MF2	0.8525 ± 0.0034	0.3803 ± 0.0041
MF3	0.8215 ± 0.0028	0.4304 ± 0.0049
HF	0.9012 ± 0.0040	0.4157 ± 0.0004
LF	1.0126 ± 0.0114	0.4387 ± 0.0011
Triphala	3.824 ± 0.011	1.0251 ± 0.0058

**6. Conclusion :-** SimhnadGuggul formulation is rich in tannins as it contains Triphala, so gallic acid, catechin and ellagic acid being most common of tannins and having profound anti oxidant profile, they need to be authenticated by TLC for their presence. Present study has provided TLC authentication method and validated, economical and reliable HPLC methods for estimation of gallic acid and ellagic acid were developed which found to be sensitive, accurate and precise for their quantification in a complex ayurvedic formulation SimhnadGuggul.

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### Caption List

**Fig. 1** TLC result of std. gallic acid [GA] Catechin [CT] and Ellagic acid [EA] in alc. extract of SimhnadGuggul formulation[F]

**Fig. 2**HPLC study results for gallic acid and ellagic acid

**Fig. 3**Linearity graph for gallic acid and ellagic acid

**Table 1** Simhnadguggul samples details

**Table 2**Repeatability and reproducibility results

**Table 3**Intraday and Interday precision study results

**Table 4**Recovery study results

**Table 5**Validation result summary

**Table 6**Yield of gallic acid and ellagic acid

## A REVIEW ON INTERNET OF NANO THINGS

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**Abstract:** Nanotechnology is empowering the improvement of smaller than usual gadgets ready to perform straightforward assignments at the Nano scale. The interconnection of such nano devices with traditional wireless networks and ultimately the Internet enables a new networking paradigm known as the Internet of Nano Things (IoNT). The IoNT involves a large number of Nano sensors that used to provide more precise and detailed information about a particular object to enable a better understanding of object behaviour. In spite of their promising applications, nano-gadgets have obliged power, energy and computation capabilities along with extremely constrained memory on board. It may just have the capacity to hold one packet at once and, thus, requires packets to be delivered before certain hard deadlines. The present noticeable quality and future guarantees of the Internet of Things (IoT), Internet of Everything (IoE) and the Internet of Nano Things (IoNT) are widely reviewed. The examination clearly distinguishes IoT and IoE which are wrongly viewed by numerous individuals. Upon examining the current advancement in the fields of IoT, IoE, and IoNT, the paper presents scenarios for the possible future expansion of their applications.

**Keywords:** Nanotechnology, Internet of Things (IoT), Internet of Everything (IoE), Internet of Nano Things (IoNT)

**1. INTRODUCTION :-** Nanotechnology is the study of the controlling of matter on an atomic and molecular scale, which deals with structures sized between 1 -100 nanometers in at least one dimension. It also involves creating materials or devices within that size. Nanotechnology is very important and interesting area of research having various applications in different areas, such as Medicine, Industry, Environment, Agriculture, Power sector etc. Nanotechnology is a branch of Science, which is balanced for unexampled growth and applications in almost all areas of human activity. Nanotechnology follows a concept of catch-all term involving multiple fields ranging from the healthcare to variety of commercial products. The electronic devices realize many complex functions have vast scope in Information and Communication Technology. The aim of next generation computers is to process and store huge amount of data for information exchange. Existing property of nano technology matters at the smallest scale is opening huge chances that will allow limitations in many existing technologies to be overcome and thus has the potential to be part of every industry in one or other from such as Nano-electronics, Nano-materials and Nano-biotechnology. Nanotechnology supports a new set of tools to build Nano scale components with specific functionalities, such as computing, data storing, sensing and actuation. As shown in Fig. 1, advanced Nano devices can be created by integrating several of these Nano components in a single entity, which leads to promising applications in diverse fields. [4]

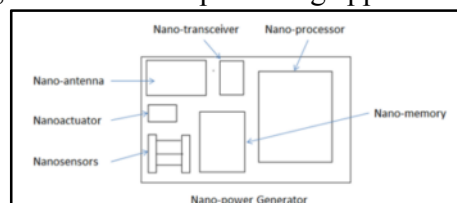


Fig. 1. Conceptual design of Nano-Device. Adapted from [4]



**2. Internet of Things (IoT) :-**Internet of Things can be defined as all electronic devices of different size and functionality are connected to the Internet. The scope of the connections is growing beyond basic machine-to-machine communication. IoT devices employ a broad array of networking protocols, applications and network domains [3]. Powerfulness of IoT technology is facilitated by physical objects being linked to the Internet by various types of short -range wireless technologies such as: RFID, UWB, ZigBee, sensor networks and through location-based technologies [3]. In simple words IoT is nothing but Network of Networks. As shown in Fig. 2, all different individual networks are interlinked together with security, analytics and management.

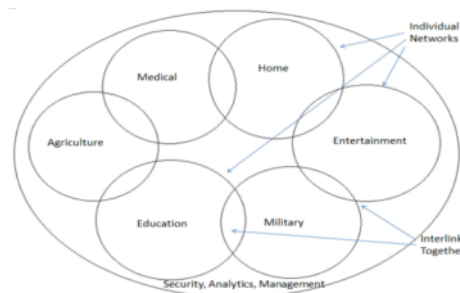


Fig. 2. Basic view of Internet of Things. Adapted from [4]

**3. Internet of Everything (IoE) :-**The concept of the Internet of Everything originated at Cisco, who defines IoE as "the intelligent connection of people, process, data and things". As shown in Figure 3, The Cisco version of IoE is built upon the "four pillars". Qualcomm's interpretation of the term has been replaced by the IoT by a majority of others. [1]

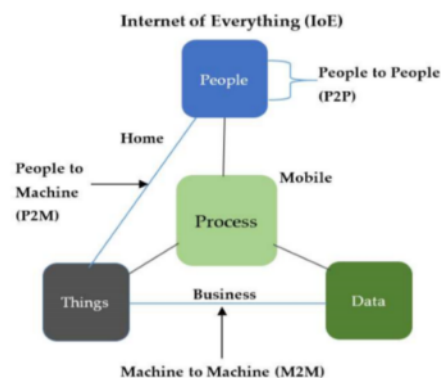


Fig. 3. Internet of Everything. Adapted from [4]

The Internet of Everything (IoE) is a concept that extends the Internet of Things (IoT) emphasis on machine-to-machine (M2M), person-to-machine (P2M), and person-to-person (P2P) communications to describe a more complex system that also includes people and processes. Instead of Internet of Things, the issue is more about the connections among people, process, data, and things that is at the heart of the Internet of Everything and creates the value [3].



Fig. 4. Internet of Everything. Adapted from Google

**4. Internet of Nano Things (IoNT)** :-The Internet of Nano things is nothing but the interconnection of nano devices with existing networks. Thus, it creates a state of the art revolution in electromagnetic communication areas among nano scale devices. A nano machine is integrated with nano components to perform several tasks. It performs the way to connect devices in case of Internet of Things, but the major difference is it can connect the nano components which are not possible with Internet of Things.



Fig. 5. Internet of Nano Things.

The concept of IoE is being extended to its fullest by the implementation of the Internet of Nano Things (IoNT). This is achieved by incorporating nano-sensors in diverse objects and through the use of nano-networks. A model of this concept as a medical application is shown in Figure 6 this provides access to data from places previously impossible to sense or from instruments inaccessible due to sensor size [7].

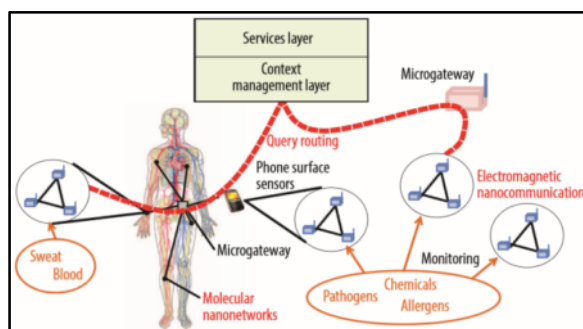


Fig. 6. Internet of Nano Things. Adapted from [7]

## 5. Applications of Internet of Nano Things

IoT is currently using in many areas and that can be extended further with the help of Internet of Nano Things (IoNT) to get the work done in more precisely. IoNT has involved in several applications using Nanotechnology.

- IoNT is used to enhance the discovery rates of the oil also it allows the location of oil to be efficiently.
- In the military, the IoNT can use to find the presence of a chemical composite in a grouping of even just a single molecule.
- Nanosensors have the capability to identify the issues of very small cracks in bridges, civil structures, vehicles, textiles and rockets.
- IoNT is used to improve the productivity of the agriculture. It can enable precision farming that uses facilities of satellite communication, geographic information systems, and remote sensing to enhance the efficiency and productivity of the agriculture [2].
- The existence of a countless number of nanosensors, it can be used to collect huge amounts of real-time information to improve the quality of life and provide new services and applications [2].
- Nanotechnology allows creating new multimedia content at the nanoscale dimension that can add more benefits to various multimedia applications such as ultra-high-resolution imaging of distant objects for satellite imaging and ultra-high-resolution imaging for crime scenes [2].
- The Internet of Nano Things reinforces the consideration control and the prevention of deadly events in high-risk patients.
- The Internet of Nano Things can be very useful in the management of vehicular traffic in large cities, contributing to the concept of smart cities.
- In industry IoNT can improve the sensitivity of touch technology using air through Nano sensors to identify movements of a particular figure in the air and translate it into signals. Most industries use Radio Frequency Identification (RFID) tags to identify and monitor the production components, but RFID tags are mostly passive and require nearby readers to exchange information [2].

## 6. Security Challenges of Internet of Nano Things

IoNT introduces new security issues that need to be addressed to ensure successful deployment of the IoNT in various applications [8]. Some of security challenges of the IoNT system are as follows:

- **Key Management:** Security keys can be distributed either by key pre-distribution before the deployment or pro-active in a sensor network before any data transmission occurs. It is essential to have the ability to revoke a key when it has been disclosed. This issue is still one of the most challenging issues in sensor networks and IoNT systems [2].
- **Performance and scalability:** There will be severe resource limitations in Nano machines that make nano communication which is unmatched in current communication systems. The performance of communication protocols and cryptographic techniques should be taken into consideration when developing practical applications [8].
- **Access Control and Authentication:** Authentication is typically achieved using traditional symmetric or asymmetric cryptography. For example, Biochemical cryptography uses biological molecules like DNA/RNA evidence. Cryptography scheme opens various novel

application domains. It leads to new issues related to the communication system. Complex molecules can spontaneously respond within the system which results in modifications out of the control of the nanomachinery. Therefore, the biochemical processes involved in the system need to be better understood [8].

- Secure Localization: Some applications that use nano communication need the localization of nanomachines to complete their operations. The difference in demands between classical sensor networks, using other coordinate systems, and nanodevices make generating an absolute positioning with nanoscale resolution difficult to realize, but relative positioning might be more relevant [2].
- Intrusion Detection: Some attacks typically cannot be handled by cryptography. For instance, denial-of-service attacks that try to disrupt the availability of a system might be difficult to protect against in a nano communication network. This is because attackers might have the necessary energy to jam radio transmission or flood the communication channel with huge amounts of molecules that destroy regular communication molecules. An intrusion detection system can be used to handle this issue by detecting the attack and trigger the system to go into a fail-safe mode. Therefore, it is critical to establish new intrusion detection systems that are able to detect and react to attacks efficiently in nanonetworks [2].

**7. CONCLUSION:-**Nanotechnology is for nanoparticles which cannot be identified with earlier technologies. Nano sensors help to collect the information from nanoparticles of the microscopic world. The data accuracy and observations up to cell level make the Nano sensors more reliable. Though the Internet of Nano Things (IoNT) is still at evolving stages, the days are not far when it can be applied in many useful application areas to provide more extended functionality what we are currently getting from the Internet of Things (IoT).

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## STRESS AND COPING AMONG THE ALCOHOLICS ADMITTED IN SELECTED DE-ADDICTION CENTER 'S OF DHARWAD DISTRICT

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### ABSTRACT

Alcohol is a psychoactive substance with dependence -producing properties that has been widely used in many cultures for centuries. The harmful use of alcohol causes a large disease, social and economic burden in societies. The harmful use of alcohol can also result in harm to other people, such as family members, friends, co-workers and strangers. Moreover, the harmful use of alcohol results in a significant health, social and economic burden on society at large.

**Keywords:**-stress, coping, alcoholics, de-addiction centers.

### INTRODUCTION

**“More men are drowned in a glass than in the sea**

**Freedman**

### Back ground of the study

Worldwide, 3 million deaths every year result from harmful use of alcohol, this represent 5.3 % of all deaths. The harmful use of alcohol is a causal factor in more than 200 disease and injury conditions. Overall 5.1 % of the global burden of disease and injury is attributable to alcohol, as measured in disability -adjusted life years (DALYs).Alcohol consumption causes death and disability relatively early in life. In the age group 20 –39 years approximately 13.5 % of the total deaths are alcohol-attributable. There is a causal relationship between harmful use of alcohol and a range of mental and behavioural disorders, other non -communicable conditions as well as injuries. The latest causal relationships have been established between harmful drinking and incidence of infectious diseases such as tuberculosis as well as the course of HIV/AIDS. Beyond health consequences, the harmful use of alcohol brings significant social and economic losses to individuals and society at large. Alcohol is a depressant drug that contains absolutely no nutrients, slows down the activity of the brain and does not help relieve tension, induce sleep or solve problems<sup>1</sup>.Alcohol is a natural substance formed by the reaction of fermenting sugar with yeast spores Different alcoholic beverages are produced by using different sources of sugar for the fermentation process. For example, beer is made from malted barley. Wine from grapes or berries, whiskey, from malted grains, and rum from molasses. Distilled beverages. whiskey, scotch, gin, vodka, and other “hard” liquors derive their name from further concentration of the alcohol through a process called distillation<sup>2</sup>.The body burns alcohol at about 0.5 ounce per hour, so behavioral changes would not be expected in an individual who slowly consumes only one average sized drink per hour. Other factors do influence these effects, however, such as individual size and whether the stomach contains food at the time the alcohol is consumed. Alcohol is thought to have a more profound effect when an individual is emotionally stressed or fatigued<sup>3</sup>. All alcoholic beverages contain the same mood -changing agent – ethyl alcohol though in varying percentage. Alcohol needs no digestion and is absorbed rapidly into the blood stream. Cold showers or coffee do not remove the effect of alcohol from the body only the liver can. Liver takes about one hour to break down one drink of alcohol<sup>1</sup>. Drinking a small amount is not harmful for most people, but regular drinking of a lot of alcohol can cause health, personal and

social problems<sup>3</sup>. In India, alcohol has been consumed since the Vedic period of 2000 –800 BC and was allowed in Hinduism, particularly among the ruling classes<sup>4</sup>. Some religions like Buddhism, Jainism, and Islam did not allow their followers to drink. Although alcohol became more freely available in the Indian subcontinent under British rule, Indians did not generally incorporate drinking alcohol into their social or religious activities<sup>5</sup>. When India became independent in 1947, Mahatma Gandhi and the Indian National Congress Party campaigned against liquor production and sales on the grounds that it was injurious to health<sup>3</sup>. Although, several states enacted prohibition again during the 1990s as a response to pressure from lobby groups concerned about the social and health consequences of consumption, the result has been mixed at best<sup>6</sup>. The wife of an alcoholic, who enters into marital life with a heart full of expectations, becomes disillusioned when she faces tough life situations, from the alcoholic husband. She may experience psychological problems due to her life with the alcoholic husband. The wives of alcohol-dependent individuals experience high levels of stress from dual problems husband's alcoholism and domestic violence by the husband, and are thus a high-risk group<sup>7</sup>. Many women worry about their partner's or husband's drinking. The negative effects of alcohol are as damaging to them as they are to the alcoholic themselves. Some of the issues they face include: Financial worries: The alcoholic spends a large proportion of his income on drink. They are also putting their jobs at risk by drinking. Emotional stress : Living with an alcoholic is an emotional rollercoaster. This puts great strain on the partner or wife of a drink dependent man. The alcoholic can undergo huge mood swings, generally dependent on the alcohol level in his bloodstream. The family, and in particular the wife, bears the brunt of this. Emotional stress is one of the greatest effects of alcoholism on family life. Depression : Depression is more common among partners and wives of alcoholics. This is hardly surprising. Self-blame, anger, stress, shame, hopelessness are all understandable emotional reactions felt by someone when involved with an alcoholic. These emotions can lead to clinical depression. Co-dependency: the wife or partner of an alcoholic becomes a kind of 'little helper' for the alcohol addict. They do everything for the alcoholic while ignoring their own emotional and physical needs. Abuse: Abuse can take many forms. We are all used to the image of the 'wife beater'. Yet this is only one type of abuse. Wives of alcoholics can be subjected to all types of alcoholic abuse. Verbal, emotional, financial abuse are all faced by wives of alcoholics on a daily basis<sup>8</sup>. According to the World Health Organization alcohol use disorders accounted for 1.5% of the global disease burden. Globally, alcohol consumption causes 3.5% of deaths (1.8million) and 4.0% of the disability-adjusted life years lost (58.3 million)<sup>9</sup> United Nations Office on Drug and Crime and Govt. of India report in 2004, 62 million alcoholics were reported in India<sup>10</sup>. In northern India, alcohol use has been estimated as 25 to 40% in the general population, whereas in southern India this rate has been estimated as 30 to 50%. In southern India, the prevalence of alcohol use is higher among people of lower socio-economic status and those who have lower levels of education<sup>11</sup>. A large-scale survey over 32,000 people performed in 2001 found alcohol use rates of 20 to 38% in males and 10% among females<sup>12</sup>. Physicians at Bangalore National Institute of Mental Health and Sciences conducted a study on alcoholism which reported that per capita consumption of alcohol in Karnataka has gone by 114percent<sup>11</sup>. A retrospective analysis was conducted using data from a Quebec community health survey was to ascertain the mental health of female spouses living with a male lifetime at-risk drinker. And to examine the relationship between male lifetime at-risk drinkers (aged 30 -54 years) and the psychological distress of their nondrinking female spouses. Psychological distress was measured using the Induce de Distress Psychological. This study confirmed higher levels of psychological distress in female spouses of male lifetime at-risk



drinkers in the general population<sup>13</sup>. The study conducted by Brown University USA regarding psychological and relationship distress among 90 non-alcoholic women with alcoholic male partners seeking outpatient, conjoint alcohol treatment. Results indicated that greater psychological distress among these women was most strongly associated with lower satisfaction with the marital relationship, presence of domestic violence, lower frequency of male partner's drinking, lower perceived social support from family, and more frequent attempts to cope with the partner's drinking.<sup>14</sup> A study was conducted on 30 wives of alcoholics using Oxford - Guthrie's 'Coping with Drinking' questionnaire. The commonest coping behavior reported was discord, avoidance, indulgence and fearful withdrawal while marital breakdown, taking special action, assertion and sexual withdrawal were least frequent. There was no significant correlation between the coping behaviors and the variables like duration of marriage, duration of husband's alcoholism, socio-economic and educational status.<sup>15</sup> Literature shows that wives of alcoholics experience stress and they use various coping methods to adjust with stress. It may be adaptive or maladaptive. This in turn has an impact on wives' physical and mental health and also influences family functioning. By assessing the problem and providing proper education, the investigator felt that it is necessary to study stress and coping among wives of alcoholics. A nurse plays a pivotal role both in hospital and community settings in improving the health of the individual and family.

**Instruments Used for the Data Collection:** - A structured questionnaire was thought to be best for data collection in the present study. Method of gathering information according to review of literature it was discussed with expert use of stress and coping respondent through Structured Interview Schedule. Development of structured questionnaire on perceived stress and coping. The Structured Questionnaire was developed after taking following steps.

i. Review of literature related to the similar studies.

ii. Opinion of experts from nursing education.

iii. A modified tool of Cohen's perceived stress scale under the expert's guidance.

iv. A modified tool of Folkman and Lazarus coping scale under the expert's guidance.

Structured questionnaires were prepared to collect the data to achieve the objectives of the study based on the review of literature and consultation with the experts. The instruments for the present study consisted of 1. Personal profile to collect the sample personal variables 2. Perceived stress scale for alcoholics. 3. Coping check list among wives of alcoholics.

**I. Personal profile:** It includes age, religion, education, occupation, family income, type of family, duration of marital life, no of children's, duration of alcoholism. Pattern of alcohol drinking in last 1 year, nature of alcohol consumption, any other substance abuse.

**I. Perceived stress scale for alcoholics:** Perceived stress scale was a standard tool developed by Cohen's which is a five point scale, consists of 14-items, this standard tool was modified as per the guidance of the research expert so as to achieve the intended objective of the study. The tool consisted of 14 questions related to the feelings experienced by the alcoholics. There are five alternative response columns; for each question like never, almost, sometimes fairly often, very often. Among fourteen items, 7 were positively worded hence scored as; 0, 1, 2, 3 and 4 score for never, almost, sometimes fairly often and very often respectively. The remaining 7 items are negatively worded hence scored as; 4, 3, 2, 1 and 0 score for never, almost, sometimes fairly often, very often respectively. The total PSS score ranged from 0 - 56. The score was further divided arbitrarily into, Mild stress (0- 19), Moderate stress (20 - 39), Severe stress (40- 56)

**II. Ways of coping check list among alcoholics:** The revised Ways of Coping

developed by Folkman & Lazarus, 1985. differs from the original Ways of Coping Checklist (Folkman & Lazarus, 1980) in several ways. The response format in the original version was yes / No; on the revised version the subject responds on a 4-point Likert scale the questionnaire consists of 66 items in total. There are four alternative answers from which the participant had to choose one alternate. to what extent you used it in the coping situation. The total score ranges from 0 - 198 there are four alternative responses mainly "Not used", "Used some beat", and "Used a quite bit", "Used great deal. The 66 items are positively worded hence scored as 0, 1, 2, and 3. The ways of coping mechanisms scores were arbitrarily categorized into 3 categories based on the score viz Not able to cope (0 -66), Able to cope to some extent (67-132), Able to cope effectively (133-198).

**Content validity:** Content validity is the degree to which the items in the instrument adequately represent the universe of content for the concept being measured. It is relevant for both affective measures and cognitive measures. The perceived stress scale and the ways of coping checklist, were content validated by giving to seven experts from various fields such as Doctor, nursing educators, educators from psychology and social worker. There was 100% agreement by all experts. However, there were few suggestions for in the stress scale item no 8,12. and ways of coping checklist 8, 21 62. To be include two standard scale to assess the stress and ways of coping. Was incorporated in the final draft under the guidance of the expert.

**Reliability:** Reliability is the degree of consistency or dependability with which an instrument measures the target attribute which it is designed to measure. It is the major criterion for assessing quality and adequacy of an instrument. There liability was established through test re-test methods by administering it to 10 alcoholics admitted in selected de-addiction centers of Dharwad district. The Karl Pearson's coefficient of correlation was computed for perceived alcoholics stress questionnaire and ways of coping were 0.82 and 0.87 respectively. This indicated that all the tools were reliable

**Pilot study:** A pilot study was conducted on wives of alcoholics admitted in selected de-addiction centers of Dharwad district. After taking administrative approval from August 14<sup>th</sup> – 20<sup>th</sup> of, 2010. The purpose of pilot study was to assess the alcoholics stress and coping, to find out the feasibility of conducting the study and to decide upon the plan of statistical analysis. Ten percent of the sample (six) planned for final study was selected as per the sampling technique. Tools were administered through structured interview method to the study subjects and data was collected. The structured questionnaire on perceived stress scale and ways of coping check list took approximately 50 – 60 minutes to complete. The data analysis plan was decided upon and was judged to be appropriate for the study. The tools and study design were found to be feasible

**Procedure for the data collection :** Formal administrative permission to conduct the study at the selected de-addiction centers of Dharwad district was obtained from the Institution administrators and hospital medical superintendent. To obtain a true response, the subjects were explained about the purpose and usefulness of the study and assurance about the confidentiality of their responses was also provided. An informed consent was also obtained from the respondents indicating their willingness to participate in the study. The study samples were administered with structure interview schedule questionnaire on perceived stress scale and structured ways of coping scale along with personal profile. The data were collected from 23.08.2021 to 18.09.21. The data collection process was terminated after thanking every respondent for their participation and co-operation.

**Data Analysis:** Data analysis is the systematic organization and synthesis of research data and testing of research hypotheses using those data. Data analysis consists of examining, categorizing, tabulating or otherwise re-combining the evidence, to address initial propositions of a study. Data obtained was planned to be coded and edited to reduce the large data into a master sheet. Both descriptive and inferential statistics were planned to be used in this study to achieve the objectives of the study.

**Descriptive and inferential statistics were used to analyze the data** . i. Frequency and percentage for selected personal variables.

- ii. Mean, median, standard deviation, for stress and level of coping among the alcoholics.
- iii. Chi-square to assess the association between stress and level of coping among wives of alcoholics and their selected personal variables like age, religion, education, occupation, family income, duration of marriage, no of children's, type of family, duration of husband's alcoholism

## Results

**Table 1: Description of personal variables of alcoholics. A. Frequency and percentage distribution of alcoholics according to their selected personal variables.**

S.No	Personal variable	Frequency	Percentage
<b>1.</b>	<b>Age</b>		
	a. 21-30years	07	11.67
	b. 31-40years	24	40
	c. 41-50 years	23	38.33
	d. 51-60 years	06	10
<b>2.</b>	<b>Education</b>		
	a. Illiterate	17	28.33
	b. Primary school(1st-7thstd)	14	23.33
	c. High school(8th-10thstd)	20	33.34
	d. Graduation	09	15
<b>3.</b>	<b>Occupation</b>		
	a. Agriculture	18	30
	b. Coolly	22	36.67
	c. Business	11	18.33
	d. Service in Government sector	09	15
<b>4.</b>	<b>Family income (rupees per month)</b>		
	a. Rs2001to Rs 3005	11	18.33
	b. Rs3501 toRs5000	09	15
	c. Rs5001toRs6500	15	25
	d.AboveRs6500	25	41.67
<b>5.</b>	<b>Religion</b>		
	a. Hindu	53	88.33
	b. Muslim	03	5
	c. Christian	03	5
	d. any other	01	1.67
<b>6.</b>	<b>Type of family</b>		
	a. Nuclear	45	75
	b. Joint	15	25
<b>7</b>	<b>Duration of marital life</b>		
	a.Below05Years	08	13.33
	b.05to10years	17	28.33
	c.11-15years	15	25
	d.Above16years	20	33.33
<b>8</b>	<b>No of children</b>		
	a. One child	14	23.33
	b. Two children	24	48.33

	c. More than two children	19	31.67
	d. No child	03	5
<b>9.</b>	<b>Duration of alcoholism.</b>		
	a. Below 5 year	11	18.33
	b. 6 to 10 year	12	20
	c. 11 to 15 year	24	40
	e. above 16 year	13	21.67
<b>10.</b>	<b>Alcohol drinking in last 1 year</b>		
	a. Continuous	30	50
	b. Episode	27	45
	c. Occasional	03	5
<b>11.</b>	<b>Nature of alcohol consumption</b>		
	a. Arrack	01	1.67
	b. Beer	01	1.67
	c. Wine	01	1.67
	d. Rum/Whisky/Vodka/Brandy	57	95
<b>12.</b>	<b>Any other substance abuse</b>		
	a. Tobacco	36	60
	b. Any others substance abuse	01	1.67
	c. Nil	23	38.33

**Table-2 Stress and coping among alcoholics mean median, standard deviation and range. n=60**

	Mean	Median	S.D	Range
Perceived stress	27.38	28	2.96147	Minimum score - 21 Maximum score-33
Ways of coping	101.88	102.5	15.18876	Minimum score - 68 Maximum score-136

**Table-3 Frequency, percentage distribution of alcoholics according to levels of stress n=60**

Variables	Levels of perceived stress.		
	Mild Stress (0-19)	Moderate Stress (20-39)	Severe Stress (40-56)
Alcoholics Perceived stress frequency. Percentage.	0 (0%)	60 (100%)	0 (0%)

**Table-4 Frequency, percentage distribution of alcoholics according to levels of ways of coping. n=60**

Variable	Levels of ways of coping		
	Not able to cope (0-66)	Able to cope to some extent (67-132)	Able to cope effectively (133-198)
Alcoholics ways of coping, frequency percentage	0(0%)	59(98.33%)	1(1.66%)

### Section-5 Chi -square values among alcoholics regarding stress according to their selected personal variables.

Chi- square value is significant for variable like age, the obtained chi -squares values for the variables like education, occupation, family income, religion, type of family, duration of marital life, no of children. Duration of alcoholism's, alcohol drinking in last 1 year, nature of alcohol consumption. Any other substance abuse. Were not significant at 0.05 levels. Therefore, the findings partially support the null hypothesis  $H_{01}$  and the research hypothesis, inferring

significant association between levels of perceived stress and selected personal variables.

### **Section-6 Chi-square values among alcoholics regarding coping according to their selected personal variables.**

Shows that the obtained chi-square value is significant for variable like type of family, duration of marital life, any other substance abuse. The obtained chi-square values for the variables like age, education, occupation, family income, religion, no of children. Duration of husband's alcoholism's, alcohol drinking in last 1 year, nature of alcohol consumption were not significant at 0.05 level. Therefore the findings partially support the null hypothesis H<sub>01</sub> and the research hypothesis, inferring significant association between levels of perceived stress and selected personal variables.

### **Conclusion**

As we prepare to enter the twenty first century, India has shown the clear signs to emerge as a developed country and enroll its name in the lists of super power, self-dependent nations. Hence to achieve these goal development of human resource plays an most important role, which meant not only quantity but quality of human resource, The impact of alcohol dependence in husbands causing a crisis in socially structured responses and the psychosocial development of the family members are a challenging problem to research. Majority of the of alcoholics experience stress and use all coping strategies during stressful situations. The findings of this study will help community health nurses, and psychiatric nurses to identify, various coping strategies adopted by alcoholics and will help them to strengthen the healthy adaptive coping strategies and help them to perceive the stressful situations as manageable. Challenging and not threatening. An understanding of adaptive coping styles can be used in the prevention of distress and the promotion of wellbeing.

This study explored the level of stress and ways of coping experienced by the alcoholics admitted in selected de-addiction centers of Dharwad district. Assessment of the overall level of stress revealed that highest Percentage 100% of the alcoholics had Moderate stress, where as 0% had Mild stress and severe stress. Assessment of the overall levels of coping shows that highest Percentage 98.33% of the alcoholics had able to cope to some extent. And 1% was able to cope effectively. 0% had not able to cope, poor level of coping. The mean stress scores of wives of alcoholics' was 27.38. The mean of overall coping scores of alcoholics was 101.88. The study findings point on the significant relationship in the stress variables like age, and in the coping type of family. Duration of marital life. Any other substance abuse hence the study concluded that stress in alcoholics lead to many consequences in alcoholics and the remedial action was not effectively taken. There was thus a need to provide information regarding stress management and it is very important to note that a high degree of empathetic understanding is needed to help the alcoholics in better coping.

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## Efficiency of Nursing Care Package on Expected Outcome Regarding Prevention of Ventilator Associated Pneumonia among Ventilated Clients in ETCM Hospital Kolar

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### ABSTRACT:

**Background:-** Pneumonia has accounted for approximately 15% of all hospital-associated infections and 27% and 24% of all infections acquired in the medical intensive-care unit (ICU) and coronary care unit, respectively. It has been the second most common hospital-associated infection after that of the urinary tract. Because of this tremendous risk, in the last two decades, most of the research on hospital-associated pneumonia has been focused on ventilator-associated pneumonia. This study was aimed to assess efficiency of nursing care package on expected outcome regarding prevention of ventilator associated pneumonia among ventilated clients.

**Method:** A Quantitative research approach with quasi experimental research design with pre and posttest with equivalent control group design was used to carry out the study. Ventilated clients from selected hospitals who were fulfilling the inclusion criteria were selected by using Non-probability convenient sampling technique. Total 40 (20 experimental and 20 control group) sample was included in the study.

**Results:** In experimentally group majority 50% had mild Infection and only 15% had No Infection in pre test and in post test majority 75% had No Infection and only 25% had mild Infection and no patient had severe infection. It shows delivery of nursing care package is effective in decreasing ventilator associated pneumonia. In control group majority 50% had mild Infection and only 10% had No Infection in pre test and in post test majority 40% had mild Infection and 60% had severe Infection and no patient had severe infection. Here nursing care package were not delivered so number of infected cases was increased. The efficiency of Nursing care package on expected outcome regarding prevention of ventilator associated pneumonia between experimental group was statically significant and control group of it was not significant.

**Conclusions:** The delivered nursing care package on ventilator associated pneumonia among ventilated clients proved its beneficial effects in terms of expected outcomes in controlling infection level and preventing ventilator associated pneumonia at Intensive care units. This study confirmed that nursing care package for ventilated clients can prevent infection and cut short long stay in Intensive care units.

**Key words:** efficiency; Nursing care package; expected outcome; ventilator associated pneumonia

**INTRODUCTION:-** Pulmonary and respiratory disorders are the world's 5<sup>th</sup> greatest cause of mortality. The third largest air problem in India was chronic pulmonary obstruction, asthma, pneumonia, TB, interstitial lung illnesses, and many other ailments. In the absence of a patent airway, sufficient gas replaces or together, a patient needs more intrusive assistance with instillation and automatic breathing to save a patient's life. Mechanical ventilation is a way of assisting or replacing spontaneous breathing artificially. The method is also to use a system to enhance movement between the air and the alveoli of oxygen and carbon dioxide with the aim of strengthening the pulmonary gas exchange. The earliest description of mechanical ventilation was Roman doctor Galen. Mechanical airing is shown when the impulsive ventilation of the patient is insufficient to sustain life. For physiological or clinical reasons it is indicated. Physiological goals include promoting the exchange of cardio-pulmonary gas and raising pulmonary volume. The



pneumonia associated with the fan (VAP) is a pneumonia that develops additional than 48 hours following endotracheal intubation in mechanically ventilated cases. It is one of the most important deaths caused by infection in hospitals. The patient has a pulmonary shadow that causes fibre, increased numbers of blood and other symptoms of infection. Mechanical ventilation and inappropriate treatment following incubation are the main danger factors for the maturity of fan connected pneumonia. Critically ill clients are at greater danger of pneumonia linked with a ventilator, especially in incubated patients. The number of pneumonia infections acquired in the medical intensive concern part (ICU) and coronary concern part was around 15 percent and all infections at 27 and 24 percent. After the urinary tract, it was the second -largest hospital-related infection. Because of this enormous danger, most resea rch has concentrated on ventilator - associated pneumonia in the previous two decades. Different studies have found other important pneumonia-risk factors, most of which co -exist in critical patients on mechanical ventilation. These include the main analysis of burns, trauma or c entral nervous system diseases. The thoraco - abdominal surgery. The depressed level of awareness. Previous to this incident, the large volume of the aspiration has been affected; the chronic lung condition underlying the treatment is chr omed. >70 years of age. Analysis of pneumonia -related morbidity has revealed that Pneumonia -related hospitals can extend their ICU stays to 4.3 to 6.1 days on average, and 4.9 days in the hospital. Reduce pneumonia associated with ventilation is vital as it raises the risk of mortality of critically sick individuals and the amount of time the patient stays in intensive care units and therefore increases health costs. The most widely utilized way of living nowadays in medical is mechanical ventilation. Mechanical ventilation often saves lives, but is not without risks like other treatments. Mechanical ventilation physiological problems include ventilator -induced pneumonia, cardiovascular compromising, gastrointestinal storms, pneumothorax and pneumonia, which i s mostly connected with the ventilator. Pneumonia is the world's second most prevalent nosocomial illness and a significant cause of death as a result of hospital infections. Intensive concern part (ICU) patients are at danger not only for disappearing fro m their dangerous disease, but also from secondary treatments such the illness of nosocomia. Acquisition of Hospital In critically diseased patients, pneumonia is the next most recurrent nosocomial illness, with 27 percent of all critical patients affected. Ventilator associated pneumonia (VAP) in clients undergoing mechanical ventilation arises within 48 hours as a nosocomial pneumonia. There are numerous risk factors for VAP and they are classified into controllable and unmodifiable ones. Changeable factors comprise: the sudden location, gastric tightness, unsuccessfully sucking, secret pooling, ventilator circuit contamination, frequent patient transfer, normal saline infestation, undertaking, non - compliance with the protocol for Hand cleaning, indiscrimina te antibiotic usage, and a lack of endotracheal tube training (ETT) prevention and low pressure. Factors that cannot be modified include men's, 60 years of age, sharp respiratory suffering, multi -organ disability, coma, constant disruptive pulmonary illness, tracheostomy, re-intubation, neurosurgery, and brain damage are all possibilities. VAP start-up may be divided into two types: early start -up and late start-up. VAP is associated with antibiotics prior to time start - vulnerable organisms are surrounded by 48 to 96 hours after intubation. Late VAP, which develops more than 96 hours after intubation, is caused by antibiotic-resistant bacteria. The present study was carried out with the objective of finding out the efficiency of nursing care package e on ex pected outcome regarding prevention of ventilator associated pneumonia among ventilated clients in ETCM Hospital Kolar.

**MATERIALS AND METHODS :-**A present study is based on quantitative research approach with quasi experimental research design with pre and p osttest with equivalent control group design was adopted in ordered to achieve the objectives of the study at ETCM Hospital Kolar,

after approval of institutional ethical committee for the period for three months. The Independent variable is nursing care package developed by author is independent variable and dependent variable is expected outcome on Prevention of ventilator associated pneumonia. By adopting Non - probability convenient sampling technique. Total 40 (20 experimental and 20 control group) sample was included in the study with following sampling criteria:

Inclusion criteria:

Ventilated clients with,

- 1] Conditions such as
  - a. Trauma, Head injury
  - b. Cardio thoracic Surgery
  - c. OPC (Organo Phosphorus Compound) poisoning
- 2] Age group between 20-50 years
- 3] Both gender
- 4] Clinical pulmonary infection (CPIS) score less than 6 score on 0 daytime of ventilation

Exclusion criteria:

Ventilated clients with

- 1] Brain death and Neuro muscular blockades
- 2] GCS<11, APACHE>29
- 3] Pelvic injury and Spinal injury
- 4] Acute Respiratory suffering condition (ARDS)
- 5] Constant Obstructive Pulmonary illness (COPD)
- 6] Heart failure and renal failure
- 7] Hepatic failure
- 8] Immuno compromised patients (Cancer, HIV/AIDS)

Following definitions were used in the study

**1] Efficiency:** It relates to the Nursing bundle's statistically significant decrease in the incidence of ventilator-associated pneumonia.

**2] Nursing care Package :** It is a set of evidence -based treatments that includes elevating the patient's head of bed to 30 degrees, altering the patient's posture each three hours, and using a closed system suctioning device.

**3] Ventilator associated pneumonia :** A nosocomial pneumonia that occurs at least 48 hours after the initiation of mechanical ventilation.

**4] Ventilator:** It is a device that assists people with breathing when they are unable to do it on their own.

**5] Expected outcome:** In this research, it refers to increase or decrease in occurrence of ventilator associated pneumonia among ventilated clients.

Data collection tool

The data collection tool consist of three sections, Section A – Study Population variables,

**Section B:** Customized Clinical pulmonary illness scale to assess incidence of ventilator associated pneumonia among ventilated clients, section C: Physical Comfort Scale to evaluate level of physical comfort among ventilated clients regarding ventilator associated pneumonia.

**RESULTS:-**The data were analyzed on the basis of the study objectives, using both descriptive and inferential statistics. Findings are organized in the following headings

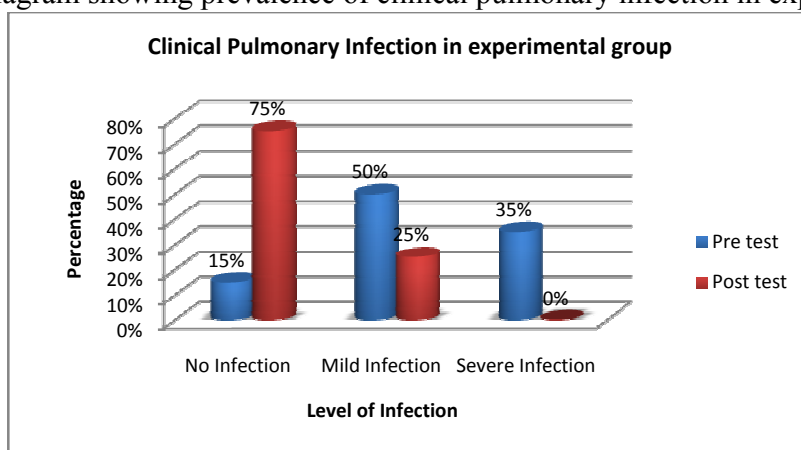
Table – 1: frequency and percentage distribution of Demographic profile of ventilated clients

Variable	Investigational Group		Manage Group	
	Frequency	Percent	Frequency	Percent
1. Age in years				

20-30 Years	5	25.0	8	40.0
31-40 years	4	20.0	3	15.0
41-50 years	11	55.0	9	45.0
<b>2. Gender</b>				
Male	14	70.0	10	50.0
Female	6	30.0	10	50.0
<b>3. Background of Admission</b>				
Medical Condition	10	50.0	15	75.0
Surgical Condition	4	20.0	2	10.0
Trauma	6	30.0	3	15.0
<b>4. Reason for Ventilation</b>				
CNS Diseases	9	45.0	5	25.0
Cardiac diseases	5	25.0	3	15.0
Respiratory diseases	1	5.0	1	5.0
Poisoning	1	5.0	1	5.0
Trauma	1	5.0	8	40.0
Others	3	15.0	2	10.0
<b>5. Type of Intubation</b>				
Endotracheal Intubation	14	70.0	9	45.0
Naso gastric Intubation	-	-	6	30.0
Tracheotomy Intubation	6	30.0	5	25.0
<b>6. Mode of Ventilation</b>				
ACV	5	25.0	3	15.0
PCV	1	5.0	2	10.0
SIMV-VC	2	10.0	2	10.0
SIMV-PC	5	25.0	4	20.0
PS	0	0.0	3	15.0
CPAP	7	35.0	6	30.0
<b>7. Period of Intubation</b>				
1-5 days	6	30.0	11	55.0
6-10 days	5	25.0	3	15.0
11-15 days	6	30.0	4	20.0
21-25 days	3	15.0	2	10.0
<b>8. Co morbid Condition</b>				
Chronic obstructive pulmonary disease	7	35.0	12	60.0
Cardiomyopathy	4	20.0	2	10.0
Chronic Renal Failure	3	15.0	3	15.0
Others	6	30.0	3	15.0
<b>9. Frequency of Suctioning</b>				
2nd Hourly	4	20.0	3	15.0
3rd Hourly	15	75.0	12	60.0
4th Hourly	1	5.0	5	25.0
<b>10. History of Smoking</b>				

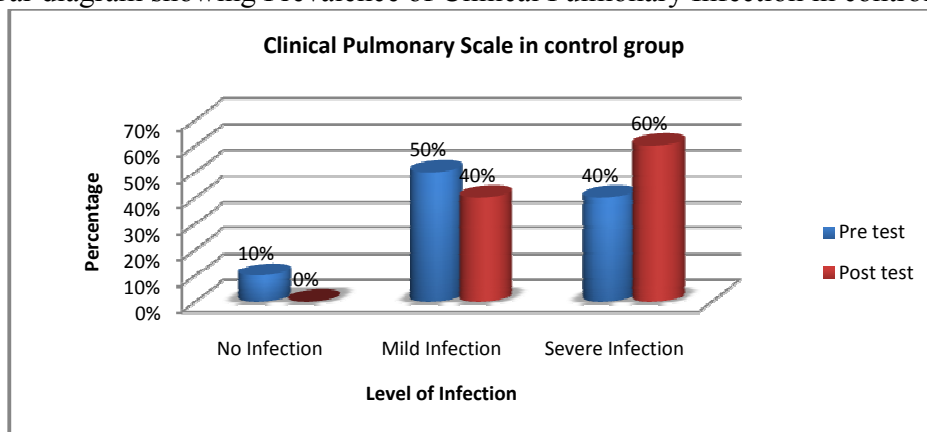
Yes	14	70.0	9	45.0
No	6	30.0	11	55.0

Figure 1: Bar diagram showing prevalence of clinical pulmonary infection in experimental group



In experimentally group majority 50% had mild Infection and only 15% had No Infection in pre test and in post test majority 75% had No Infection and only 25% had mild Infection and no patient had severe infection.

Figure 2: Bar diagram showing Prevalence of Clinical Pulmonary Infection in control group

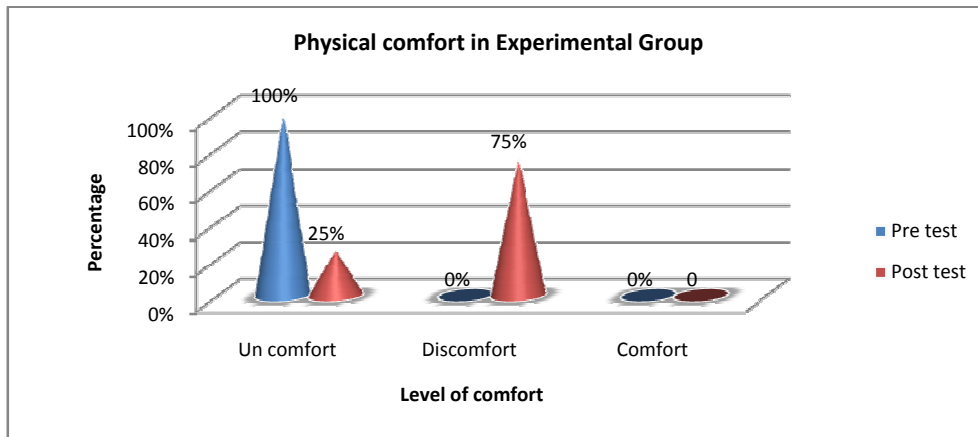


In control group majority 50% had mild Infection and only 10% had No Infection in pre test and in post test majority 40% had mild Infection and 60% had severe Infection and no patient had severe infection.

Table 2: Level of Physical Comfort in experimental group

Overall physical comfort level	Before test		After test	
	Frequency	Percent	Frequency	Percent
Un comfort	20	100.0	5	25.0
Discomfort	0	0.0	15	75.0
Comfort	0	0.0	0	0.0
Total	20	100	20	100

Figure 3: Conical graph showing Level of Physical Comfort in experimental group in pre and post test

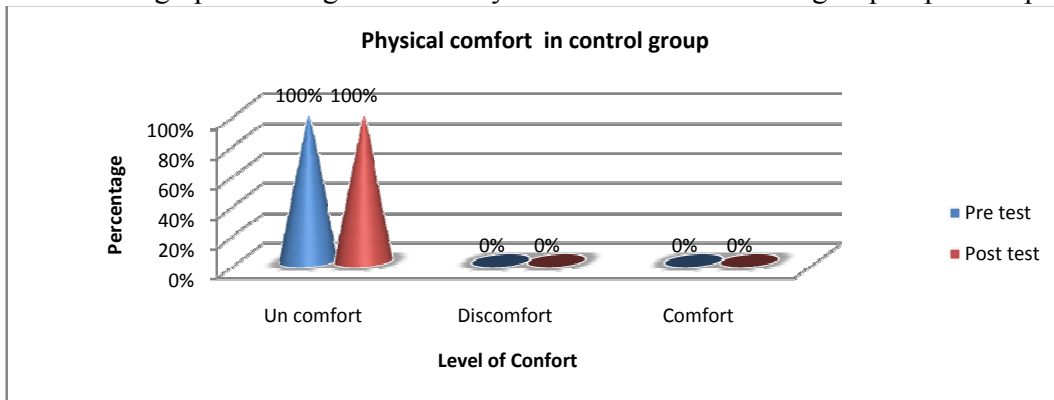


In experimentally group majority 100% had un comfort in pre test and in post test majority 75% had Discomfort and only 25% un comfort.

Table 3: Level of Physical Comfort in Control group

Overall Physical Comfort level	Before Pre test		After test	
	Frequency	Percent	Frequency	Percent
Un comfort	20	100.0	20	100.0
Discomfort	0	0.0	0	0.0
Comfort	0	0.0	0	0.0
Total	20	100	20	100

Figure 4: Conical graph showing Level of Physical Comfort in control group in pre and post test



In control group all the subjects 100% had un comfort in pre and post test.

Table 4: Mean, Mean% and SD of before test and after test CPI Scores

Groups	No. of Items	Max Score	Pre test			Post test		
			Mean	Mean %	SD	Mean	Mean %	SD
Experimental Group	6	12	8.75	72.91	1.83	5.55	46.25	1.93
Control Group	6	12	9.0	75.0	1.68	9.8	81.66	1.10

The mean percentage in the experimental group is 72.91 percent and the standard deviation is 1.83 in pre test and 46.25 with standard deviation 1.93 in post test, whereas the mean percentage in the control group is 75.0 percent and the standard deviation is 1.68 in pre test and 81.66 with standard deviation 1.10 in post test.

Table 5: Mean, Mean% and SD of before test and after test PCS Scores

Groups	No. of Items	Max Score	Before test			After test		
			Mean	Mean %	SD	Mean	Mean %	SD
Experimental Group	8	32	10.10	31.56	2.82	26.15	81.71	2.25
Control Group	8	32	11.0	34.37	2.40	11.0	34.37	2.40

The mean percentage in the experimental group is 31.56 percent with a standard deviation of 2.82 in pre test and 81.71 percent with a standard deviation of 2.25 in post test, whereas the mean percentage in the control group is 34.37 with a standard deviation of 2.40 in pre test and 34.37 percent with a standard deviation of 2.40 in post test.

Table 6: Comparison of before test and after test CPI scores

Groups	Pre test		Post test		Mean difference	t Value	Df	Inference
	Mean	S D	Mean	S D				
Experimental Group	8.75	1.83	5.55	1.93	3.2	6.39	19	S
Control Group	9.0	1.68	9.8	1.10	0.8	2.99	19	S

The obtained t value 6.39 in experimental group is statically significant in experimental group and in control group the obtained 2.99 in statically significant.

Table 7: Comparison of pre-test and post test PCS scores

Groups	Pre test		Post test		Mean difference	t Value	Df	Inference
	Mean	S D	Mean	S D				
Experimental Group	10.10	2.8	26.1	2.25	16.05	16.3	19	S
Control Group	11.0	2.4	11.0	2.40	0	0.0	19	NS

The obtained t value 16.05 in experimental group is statically significant in experimental group and in control group the obtained 0.00 in not statically significant.

**CONCLUSION-**The delivered nursing care package on ventilator associated pneumonia among ventilated clients proved its beneficial effects in terms of expected out comes in controlling infection level and preventing ventilator associated pneumonia at Intensive care units. This study confirmed that nursing care package for ventilated clients can prevent infection and cut short long stay in Intensive care units. At the same time study was unable to analyze the additional factors that lead to VAP including Proper hand hygiene, appropriate antibiotic use, thoroughly suction the oropharynx and instruction of healthcare personnel concerning hospital acquired infection avoidance

Ethical approval: The study was approved by the Institutional Ethics Committee

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## A STUDY TO ASSESS THE EFFECT OF PLANNED TEACHING ON KNOWLEDGE IN RELATION TO ILL EFFECTS OF ALCOHOL CONSUMPTION AMONG JUNIOR COLLEGE STUDENTS IN SELECTED COLLEGES

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**Abstract:**-According to tenth revision of the International Classification of Diseases and Health Problem (ICD -10). "Alcoholism is cluster of physiological, behavioural and cognitive phenomena in which the use of Alcohol takes on a much higher priority". Once people start drinking excessively, it becomes very difficult to stop it, there is wide spread agreement that heavy drinking can lead to severe health problem. An estimated 107 million people worldwide suffer from an alcohol consumption disorder. This breakdown may be examined by gender for any country here; males made up 70 percent of the population (75 million), while females made up 32 million. The rising alcohol usage in India hides a more sinister truth. At present young adults have the highest prevalence of alcohol consumption? India is getting more globalised and may be more complex and the improvement in technology in turn influences the working condition by making it more stressful. Many people find alcohol an easier way to combat with stress. Substance abuse by children and adolescents is a major health problem. Although alcohol problems are manifest in the public in end stage of alcoholic, most of the burden of alcoholic is contributed by young people who have not yet developed dependence. Alcohol use has also been characterized a gateway. Substance preceding the use of marijuana and then other illegal substances. However planned teaching would provide necessary knowledge, regarding alcohol related problems. This would go a long way in preventing the progression of alcoholism among the students and their peer group during their future.

Keywords: Ill effects of Alcohol, Planned Teaching, Knowledge, Junior college students

### INTRODUCTION

*"We cannot build the future for our youth but we certainly build our youth for the future"*  
*-Franklin D Roosevelt*

Adolescent is the period where the individual's future starts to take real shape. In childhood we mainly stress on understanding the surrounding and imparting knowledge of what is good or bad for him or her apart from basic education and moral science, it is the period where one starts recognizing himself or herself as a self-identity and thinks about one place in family and society and act thereupon to establish his own identity therefore apart from various physical and hormonal changes during the period they are subjected to lot of mental stress and behavioral modification. Alcohol is the most commonly used and abused substance by the youth.

Psychoactive substances have been used by people in almost all cultures since prehistoric times. These substances have been seen as enhances of individuals and social functioning. People continue to use them for relief of negative emotional states, such as relief from fatigue or boredom and as a break from daily routine through altered states of consciousness, fear and anxiety. Alcohol and drugs also continue to be used in various religious ceremonies. However, all cultures have recognized the negative effect of alcohol and drug use. Excessive use of these substances has contributed to profound individual and social problems. It is a major public health problem. According to WHO Report, one-third of Indian men consume alcohol. More than 14% of all Indians aged 10 to 75 consume alcohol, 11 percent of Indians binge drink, compared to a

global average of 16 percent. Russia, Ireland, and Luxembourg, Belarus, Lithuania, and Grenada are the countries with the most heavy drinkers in terms of alcohol consumption. Worryingly, a third of drinkers consume cheap and shady locally brewed or country liquor, which has resulted in a number of disasters involving adulteration. According to the survey, 19% of alcoholics are addicted on the substance. A quarter of a billion individuals drink in a "harmful" way. Furthermore, according to the WHO, "unrecorded" alcohol accounts for more than half of all alcohol drunk in India. Some states, for example, do not record or tax locally brewed liquor. According to a 2014 survey by the International Alliance of Responsible Drinking, a high majority of consumers choose country liquor or homemade alcohol, which is frequently counterfeit and illegal. Maharashtra is an anti-drug state. Even at home, you must have a valid liquor licence. To consume liquor (strong beer, whiskey, vodka, gin, and rum), you must be 25 years old, whereas mild beer can be consumed after reaching 21. The state of Uttar Pradesh has the largest proportion of alcoholics in India. These findings suggest that primary intervention to decrease the risk of adult drinking must begin from childhood. Individual with alcohol dependence are usually the focus of discussion as the complication of alcohol use are very obvious.

### **Short-term problems**

- Hangovers
- Violence: Alcohol effects mood and while some people may burst into tears or hug all their friends, others become violent and aggressive.
- Accidents: Alcohol makes people careless and that can be really dangerous 40% of all abuse of all household fires are linked with people who have been drinking and alcohol is a factor in at least 7% of accidental drowning. Half of all adults admitted to hospital with head injuries are drunk.
- Hospitalization: About 1000 people under age 15 are admitted to hospitals each year with acute alcohol intoxication.
- Alcohol and drug: The mix of alcohol and drug can dehydrate the individuals, put extra pressures on the liver kidneys, further reduce their ability to make good judgements and even lead to coma.
- Sexual dysfunction such as enhanced libido and lack of erection

**Long term problems :-** Studies have shown that long term abuse produces serious and harmful effects on a variety of the body's organ systems. Parts of the human body most affects including the liver and the immune, cardiovascular and skeletal systems. Dependence (Alcoholism): It effects up 9.7% of adults and is responsible for thousands of death.

- Nutritional deficiency: Alcohol leads to a loss of vitamin B Complex, a vital group of nutrients. Vitamin B deficiency can cause skin damage, diarrhea and depression. Decreased level of iron can lead to anemia in long term.
- Liver: Liver is the organ responsible for processing alcohol into non-toxic compounds. Long term heavy drinking will damage liver cells and inhibit its vital functions.
- Heart disease: Alcohol can increase the risk of heart problems and high blood pressure.
- Digestive system: Constant use of alcohol causes irritation and inflammation of the stomach and intestinal lining causing ulcers and damage to the pancreas.
- Reproductive problems: Chronic alcoholism may lead to feminization of men (gynaecomastia). Men can suffer from an inability to get an erection, shrinking of testes and penis and a reduced sperm count. In women, the fetal alcohol syndrome, it may increase the risk of miscarriage and can result in low birth weight and birth defects.

- Mental health: Alcohol is linked to many disorders that including clinical depression and an estimated 65% of suicides.<sup>9</sup>

### **OBJECTIVES**

1. To identify the pre interventional knowledge regarding ill effects of alcohol consumption among junior college students.
2. To evaluate the knowledge of junior college students regarding the ill effect of the alcohol consumption after planned teaching
3. To assess the association between different demographic attribute such as age, sex, religion, socioeconomic status, education with knowledge regarding ill effects of alcohol

### **REVIEW OF LITERATURE**

The chapter highlights various related literature from textbooks and journals of medicine and nursing. Internet search was also carried out.

Review of literature has been categorized on the basis of their priority and contribution to the study as under: -

- A] Studies related to prevalence of alcohol use in India and at global level, Statistics in underage drinking and ill effects of alcohol consumption
- B] Studies related to Physical ill effects of alcohol consumption.
- C] Studies related to Psychological ill effects of alcohol consumption.
- D] Studies related to Social ill effects of alcohol consumption.
- E] Studies related to other ill effects of alcoholism. Accidents and injuries and violence
- F] Studies related to alcoholism and sensational gender group
- G] Studies related to risk factors and adolescents in alcohol use

### **HYPOTHESIS**

**H0-Null Hypothesis:** There will be no significant difference between mean knowledge scores of the participants.

**H1 -Alternate hypothesis :** There will be significant difference on the level of knowledge regarding ill effects of alcohol among college students before and after planned teaching

**H2 -Alternate hypothesis :** There will be no significant association between the knowledge scores regarding ill effects of alcohol and with their selected demographic variables.

### **LIMITATIONS OF THE STUDY**

The few limitations of the study are listed below: -

1. The study was limited to 100 junior college students in selected colleges.
2. Findings of the study cannot be generalized as the population under investigation small and was from the selected colleges.

### **RESEARCH METHODOLOGY**

1. **Research approach:** quantitative approach.
2. **Research design:** one group pretest and posttest design is used for study.
3. **Setting of the study:** Students of Junior college in Mumbai.
4. **Population:** 16-20 years adolescent students from selected college.
5. **Sample:** Student from selected Junior college of metropolitan city Mumbai.
6. **Sample size:** 100 students of Junior college.
7. **Sample techniques:** Non probability convenient sampling criteria

### **MAJOR FINDINGS OF THE STUDY**

#### **SECTION-I**

**Age:** It is evident that out of 100 subjects, majority of students i.e. 71 were from age group of 16-17 years(71%), followed by 29 students from age group of 18-19 years(29%), which was again followed by 20-21 years (0%), and 21 and above 0(0%) respectively. There were no students from age group of 20 years and above (0%).

**Gender:** Gender wise analysis revealed that there was maximum male students-73 (73%). There were minimum number of female students, i.e. 27(27%).

**Religion:** Religion wise analysis showed that maximum students - 82 (82%) were from Hindu community, followed by Muslims 12 (12%), others (Buddhists) 2 (2%), Christians 2 (2%), respectively. There were 2(2%) students from Sikh religion.

**Family Type:** Family Type wise analysis revealed that there were more students from Joint family 55 (55%), followed by 39 students from Nuclear family (39%). There were 6 students from Extended family (6%). There were no students from any other family,

**Educational Qualification:** Education status of parent wise analysis revealed that from parent, majority of parent were i.e. 46 (46%) had education up to secondary school followed by 22 (22%) were graduate, and 20 (20%) from primary school, 9(9%) from illiterate group, 3 (3%) were post graduate. There was not a single parent from any other group.

**Occupation of parent:** Occupation wise analysis revealed that there were maximum parents from who were 42 self employee (42%), followed by 31 private employee parents(31%), 21 parents doing government job (21%), and from any other 6 (6%) parents present.

**Income of parent:-** Income wise analysis showed that there were maximum number of students 31 who were from income group of 5001-7500 (31%) followed by 27 students having monthly income of 7501-10000(27%), 22 students having income less than 5000(22%), 13 students having income between 10001-15000 (13%), 7 students having income above 15000 (7%).

**Birth order of sample:-** Birth order wise analysis showed that there were maximum number of students from second birth order a total of 36(36%), followed by 31 first birth order students (31%). There were 21(21%) third birth order, 9(9%) from fifth birth order and 3(3%) from fourth birth order.

**Family history of alcoholism:-** Family history of alcohol consumption in the family of study subjects. Among them 21(21%) mentioned the alcohol consumption by their father, 9 (9%) revealed about alcoholism in siblings and 4(4%) reported about alcohol consumption in mother, 21(21%) reported about history of alcoholism by others..

**Alcohol consumption habit if :-**Distribution of subjects by their own experience with alcohol. Among them, 86 (86%) students mentioned that they had never consumed alcohol and only 14 (14%) mentioned that they consumed alcohol

**If yes the frequency of alcohol intake:-**The frequency of student's alcohol consumption, out of 5 (5%) who mentioned about their consumption only once in life and 5 (5%) occasional. There were 4 (4%) students who take alcohol regularly. When the subjects were asked the reason for taking alcohol 12 out of 14 reported that they taken up the habit of alcohol consumption by peer group influence.

## SECTION- II

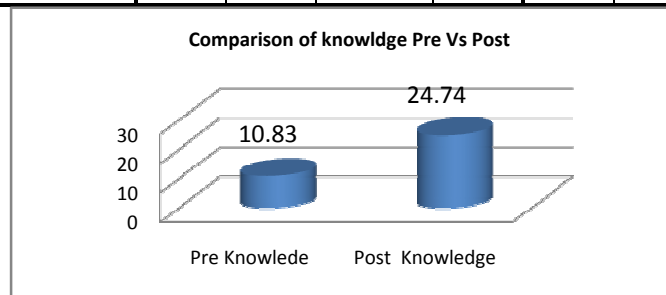
### Knowledge level of junior college students before and after planned teaching and effect of planned teaching in relation to ill effects of alcohol

The awareness in relation to ill effects of alcohol among junior college students in pre-test, score were noted 1083. The knowledge found to be very poor. After planned teaching the score increased to 2474. The post-test evaluation of above findings after the planned teaching showed

marked difference. We conclude that planned teaching helps to increase the overall knowledge of ill effects of alcohol consumption significantly.

### Paired Samples Statistic

	Mean	N	Std. Deviation	Std. Error Mean	t	df	Sig. (2-tailed)
Pre Knowledge	10.83	100	2.716		-39.396	99	.000
Post Knowledge	24.74	100	2.028				



Results suggest that there was significant increase in the knowledge score after receiving the planned teaching.

The findings of the overall test are,

$$|t_{cal}| = 39.396 > \text{table value of } t' = 1.645$$

Therefore we conclude that planned teaching helps to increase the overall knowledge of ill effects of alcohol consumption significantly.

### SECTION-III

**To determine the association between knowledge score and demographic variables.**

**Independence of religion and score.**

Calculated value of chi-square test statistic is = **24.93**

$$\chi_{cal}^2 = 24.93. \text{ From Chi-square tables, } = 15.51$$

$$\text{As } \chi_{cal}^2 = 24.93 > \chi_{8,0.05}^2 = 9.49,$$

**Hence we conclude knowledge of junior college students is dependent of religion.**

**There is no association between knowledge score and other demographic variables except religion**

**CONCLUSION:-**The major findings of the study were that the knowledge in relation to ill effects of alcohol among junior college students was inadequate.. All samples (junior college students) are very conscious and interested to learn. The findings of the study revealed that the planned teaching developed by the investigator was able to equip junior college students with knowledge in relation to ill effects of alcohol and the knowledge gap was bridged.

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## Awareness and Practice on Tooth Brushing Techniques among School Children (6 to 10 years) of Rural Schools at Kolar”

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### ABSTRACT:

**Background:** School age is a critical time in one's life and growth. It learns to be a responsible member of a peer community during childhood. Most behaviours, healthy habits, and positive attitudes change throughout this time. At the age of 12, children have 28 permanent teeth and have completed a permanent tooth eruption rather than wisdom teeth. A child's dental health may be maintained for a long time if proper brushing and hygiene habits are learned at that age.

**Methods and Materials:** The study is based on a descriptive method, with data collected using non-experimental design. A systematic interview timeline was used to obtain data. The major research was also conducted in Doddhanalli, with 75 respondents recruited using easy sampling technology and evaluated using descriptive and inferential statistics.

**Results:** The results showed that the majority had poor knowledge (49.3%) and mild insufficient knowledge (45.3%), and the majority had acceptable knowledge (5.4%) of teeth brushing methods, and it was obvious to the majority (70.7%), that the procedure was moderately successful (29.3%). The cumulative awareness rates of respondents with standard deviation 4.8 were 53.892 percent and the general realistic rates of respondents with standard deviation 3.9 were 58.2 percent. The 'r' value achieved is 0.536 and the experience and practice of children in elementary schools in terms of tooth brushing strategies was moderately optimistic.

**Conclusion:** Study concluded that school children had a modest knowledge of and a moderately good practice of dental brushing and r values indicate that the knowledge and practice of primary school children regarding dental brushing techniques has a moderate positive connection.

**INTRODUCTION:-**Every kid has a basic right to his or her overall health, and it is our responsibility to uphold this belief. Bringing children from infancy to adolescence in a happy state is a demanding undertaking that necessitates a method that is carefully planned, coordinated, and conducted by educated personnel. School age is a critical time in a person's life and development. During this time, the kid learns to be a productive member of his or her peer group. During this time, the majority of actions, good habits, and positive attitudes emerge. Learning takes happen in a variety of settings, including the home, school, and community. Children are naturally interested and receptive, and they can quickly learn, adapt, and practice new skills. School plays a vital role in the development of healthy behaviours and practices. School is not just a place where curricula are taught, but it is also a place where students may cultivate good habits and put them into practice. It's critical to capture them when they're young in order to create a lasting effect on their thoughts. Because they are in an embracing adulthood, school age is the most optimal time for impressionable brains. Children, with the exception of wisdom teeth, will have all of their permanent teeth erupted by the time they reach the age of 12 and will have a total of 28 permanent teeth. If correct brushing technique and hygiene habits are developed during this time, a child's dental health will be preserved for the rest of his life. Brushing your teeth is an important aspect of your dental care regimen. Oral hygiene is the practise of keeping your mouth and teeth clean to avoid dental diseases. For a beautiful smile and a healthy mouth. Brushing teeth is important for children's general health, not only for a brighter



smile and fresher breath. Brushing eliminates plaque, a thin coating of bacteria that adheres to teeth and causes cavities, gum disease, and, in the case of youngsters who neglect it long enough, tooth loss. Dental cavities, gingivitis, periodontal (gum) disorders, and poor breath are most usually avoided by practicing good oral hygiene and employing suitable practices. Your mouth, like many other parts of your body, is teeming with bacteria, the majority of which are safe. The mouth is both the entrance and the first line of defense for our bodies. It is responsible for more vital processes than any other bodily component. Oral health is linked to around 90% of systemic disorders. These bacteria are normally kept under control by the body's natural defenses and appropriate dental health care, such as frequent brushing and flossing. Without adequate dental hygiene, germs can build up to the point where they cause oral illnesses including tooth decay and gum disease. Dental cavities, gingivitis, periodontitis, and halitosis can all be avoided by practicing proper oral hygiene. Poor oral health, as well as untreated oral illnesses and disorders, have a major influence on one's quality of life. This has an impact on the most fundamental human requirements, such as eating and drinking, swallowing, maintaining sufficient nutrition, smiling, and communicating. Plaque buildup is also a cause of gum disease. The bacteria in plaque produce harmful chemicals that can cause gum inflammation. If plaque isn't removed on a regular basis, it might harden into calculus (tartar). This tartar contributes to the growth of additional germs and, as an irritant to the gums, causes irritation. The first symptom of gum inflammation is bleeding from the gum edges while brushing, which is painless. The gum line looks to be crimson. The illnesses may develop if adequate brushing is not done during this period. The gums may retreat at times, exposing the tooth root. Gum recession is the medical term for this ailment. If left untreated, the condition can spread to the surrounding bone, causing tooth decay and pyorrhea (pocket development around the tooth). Patients may have bleeding, itching, a dull persistent aching, increased heat and cold sensitivity, food impaction, and even loose teeth during this period. All of these signs point to a need for immediate attention and expert assistance. If left untreated, this illness might eventually lead to tooth loss. Brushing, mouth rinsing, and gum massaging should all be taught to children through live demonstrations, role-playing, and active involvement. Not only do youngsters appreciate such active learning techniques, but the practices learned at a young age will instill good dental hygiene habits in them for the rest of their life. It would go a long way toward lowering the frequency of caries among children and adolescents. In India, dental caries affects 50 percent to 60 percent of the population. Due to poor oral health conditions in the country as shown by numerous epidemiological studies, a special well-coordinated National Oral Health Program be developed to offer oral health treatment both in rural and urban regions. In remote locations, the dentist-to-population ratio is just 1:300,000. Whereas 80 percent of children and 60 percent of adults have dental caries, more than 90 percent of individuals over the age of 30 have periodontal disease, which begins in infancy. Further more, mouth cancer accounts for 35% of all malignancies in the body. As a result, the study discovered that a health-education programme on teeth brushing method is needed to avoid numerous dental diseases in rural schoolchildren.

**MATERIALS AND METHODS:-**A present study is based on descriptive survey approach was adopted in order to achieve the objectives of the study, Based on the feasibility the investigator conducted study at Dodanahalli primary school, Kolar. The Study variables is Knowledge and practice of primary school children regarding tooth brushing techniques and Demographic variables such as Age, Gender, class studying, Religion, Type of family, father occupation, Frequency of tooth brushing, Mode of tooth brushing, Time spent for brushing teeth, Interval of exchange of tooth brush, Have you ever visited dentist, Are you suffering with dental problems

and Source of information on tooth brushing technique. By adopting Non - probability convenient sampling technique. Total 75 primary schools children studying in rural primary schools, were included in the study with following sampling criteria:

**Inclusion criteria:**

- 1] Primary school children who are willing to participate in the study
- 2] Primary school children who are Available on the day of data collection.

**Exclusion criteria:**

- 1] Primary school children who are absent at the time data collection.

**Data collection tool:-** Structured knowledge questionnaire was developed which consist of three section i.e. **Section 1:** Demographic variables such as Age, Gender, class studying, Religion, Type of family, father occupation, Frequency of tooth brushing, Mode of tooth brushing, Time spent for brushing teeth, Interval of exchange of tooth brush, Have you ever visited dentist, Are you suffering with dental problems and Source of information on tooth brushing technique.

**Section 2:** Knowledge items on tooth brushing techniques which include general concept, Oral Hygiene, Dental Problems, Importance of tooth brushing and brushing techniques. **Section 3:** Practice items on tooth brushing techniques. Following are the operational definition defined under study

**Assess:** This term relates to elementary school children's opinions on teeth brushing procedure.

**Knowledge:** This relates to a primary school student's level of understanding of proper teeth brushing technique.

**Brushing the teeth practise** refers to the application or usage of a concept, belief, or approach by elementary school pupils.

**Primary School Children:** This term refers to both girls and boys between the ages of 6 and 12 who are currently enrolled in primary school.

**Brushing techniques** for teeth and gums: This is the act of cleaning the teeth and gums using a soft brush.

**Results and discussion**

The data were analyzed on the basis of the study objectives, using both descriptive and inferential statistics. Findings are organized in the following headings

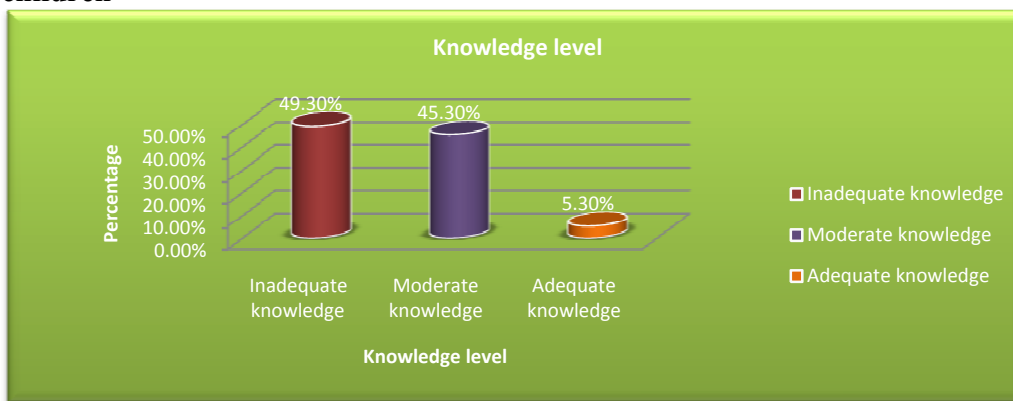
**Table – 1: frequency and percentage distribution of demographic profile of primary school children**

N=75		
Demographic variables	Frequency	Percentage
<b>Age in years</b>		
a. 6-9 years	45	60.0
b. 10-12 years	30	40.0
<b>Gender</b>		
a. Boy	28	37.3
b. Girl	47	62.7
<b>Class studying</b>		
a. First Std	8	10.7
b. Second Std	1	1.3
c. Third Std	14	18.7
d. Fourth Std	15	20.0
e. Fifth Std	6	8.0
f. Sixth Std	16	21.3

g. Seventh Std	15	20.0
<b>Religion</b>		
a. Hindu	70	93.3
b. Muslim	5	6.7
<b>Type of family</b>		
a. Nuclear Family	66	88.0
b. Joint Family	9	12.0
<b>Father's occupation</b>		
a. Self Employee	23	30.7
b. Private Job	9	12.0
c. Government Job	1	1.3
d. Agriculture	9	12.0
e. Vendor	33	44.0
<b>Frequency of brushing</b>		
a. Once a day	58	77.3
b. Two times a day	17	22.7
<b>Mode of brushing</b>		
a. Finger	22	29.3
b. Tooth Brush	44	58.7
c. Neem stick	9	12.0
<b>Time spent for brushing</b>		
a. Less than 3 minutes	51	68.0
b. More than 3 minutes	24	32.0
<b>Interval of exchange of tooth brush</b>		
a. 4-6 months	29	38.7
b. 7-12 months	30	40.0
c. More than a year	16	21.3
<b>Visited dentist</b>		
a. Yes	6	8.0
b. No	69	92.0
<b>Suffering with dental problems</b>		
a. Yes	39	52.0
b. No	36	48.0
<b>Source of information</b>		
a. TV	59	78.7
b. School	16	21.3
<b>Total</b>	<b>75</b>	<b>100</b>

The majority of primary school children (60 percent) belong to the age group 6 -9 years, while only (40 percent) belong to the age group 10-12 years. By gender, the majority of primary school students (62.7 percent) were girls, while only (37.3 percent) were males. The majority of primary school students (21.3 percent) were in sixth grade, while just (1.3 percent) were in second grade. The majority of primary school pupils (93.3 percent) belong to the Hindu faith, whereas only (6.7 percent) belong to the Muslim religion, according to the distribution of topics by religion.

The majority of primary school students (88%) come from a nuclear family, whereas just 12% come from a mixed family. The majority of primary school children's dads (44%) were merchants, with only 1.3 percent working for the government. The majority of primary school students (77.3%) clean their teeth once a day, with only 22.7 percent brushing twice a day. The majority of primary school pupils (58.73%) used a tooth brush, whereas just 12% used a neem stick. The majority of primary school students (68%) spent less than three minutes, while only 32% spent more than three minutes. The majority of primary school children (40%) interchange tooth brushes between 7 and 12 months, with just 21.3 percent (40%) exchanging tooth brushes for more than a year. The majority of primary school pupils (92%) have never seen a dentist, with only 8% having done so. Only 48% of primary school pupils did not have dental issues, despite the fact that the majority of them (52%) did. The majority of elementary school youngsters (78%) get their knowledge from television. **Fig 1: Knowledge level of primary school children**



The above graph demonstrates that the majority (49.3%) had insufficient knowledge, (45.3%) had some what poor knowledge, and (5.4%) had acceptable understanding of teeth brushing practices.

**Fig 2: Practice level of primary school children**



The majority of participants (70.7%) had Moderately Good Practice, whereas 29.3% had Poor Practice, and none had Good teeth brushing practice.

**Table – 18: Mean, mean percentage and standard deviation for the knowledge and practice scores of primary school children** N=75

Sl. No.	Knowledge aspects	No. of Items	Max Score	Mean	Mean %	SD
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1	General concept	7	7	3.41	48.71	1.817
2	Oral Hygiene	3	3	1.52	50.66	0.860
3	Dental Problems	10	10	5.07	50.7	1.427
4	Importance of tooth brushing	10	10	6.38	63.8	1.504
5	Brushing techniques	8	8	4.12	51.5	1.931
Overall Knowledge scores		38	38	20.48	53.89	4.881
Practice Scores		15	15	8.73	58.2	1.501

The maximum mean percentage obtained by the subjects (63.8%) is found in the aspect of Importance of tooth brushing, followed by Brushing techniques (51.5%), Dental Problems (50.77%), Oral Hygiene (50.66%), and the least mean percentage obtained by the subjects (48.71%) in the aspect of General concept. Respondents' total knowledge scores were found to be 53.892 percent with a standard deviation of 4.8, while their overall Practice Scores were found to be 58.2 percent with a standard deviation of 3.9

**Table 19: correlation between knowledge and practices cores regarding tooth brushing techniques**

N=75

Sl. No.	Knowledge aspects	Mean	S D	r Value	Inference
1	Knowledge	20.48	4.881	0.536	Moderate positive correlation
2	Practice	8.73	1.501		

Above table give description of correlation between knowledge and practice From above table it is evident that the obtained 'r' value is 0.536 that there is Moderate positive correlation between the knowledge and practice of primary school children regarding tooth brushing techniques.

#### Implications of the study

- 1] School teachers will benefit from an education programme that uses excellent teaching tactics to increase their understanding of oral health. Various teaching tactics may be utilized to increase students' oral hygiene knowledge in order to boost school health.
- 2] Oral hygiene knowledge and successful application should be part of the schoolteacher's curriculum. The importance of oral health information should be emphasized while school instructors are being trained.
- 3] As part of the school health service, the nurse administrator should develop and arrange a continuing education programme for school teachers in order to encourage them to undertake training programmes on proper teeth brushing technique in the classroom. Teachers can also instruct pupils on the subject.
- 4] Nurses should participate in multidisciplinary research to help enhance knowledge, which may then be applied to treat a variety of health problems. They should take the initiative to do study into the type and severity of school-related difficulties..

#### Limitations

- a. Study was conducted in specific geographic area imposes limits on generalization
- b. The findings could be generalized only to the population which fulfilled the criteria in the study.
- c. The study limited to assessment of knowledge.
- d. The sample was limited to 75 only
- e. Long-term follow-up could not be carried out due to time constraints.

#### Recommendations

On the basis of the findings of the present study the following recommendations have been made for the further study.

- a. A similar study can be replicated on a large sample to generalize the findings.
- b. A similar study may be conducted in different setting.

**Conclusion:-**This research attempted to evaluate the knowledge and practice of primary school children concerning the techniques of dental brushing and concluded that school children had a modest knowledge of and a moderately good practice of dental brushing and r values indicate that the knowledge and practice of primary school children regarding dental brushing techniques has a moderate positive connection.

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## To assess the prevalence of obesity and its risk factors in primary school children in selected schools of pune city

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### Abstract

**Background:** Childhood obesity is one of the most serious public health challenges of the 21st century. The problem is global and is steadily affecting many low - and middle-income countries, particularly in urban settings. **Methods:** About 200 school children from selected school were enrolled in the study. 200 school going children, aged between 11 to 14 years were selected through random sample method and interviewed through a structured questionnaire. Research tool comprised of questions about demographic characteristics, daily physical activity, frequency of having junk food intake etc. Height and weight were measured on calibrated scales. For statistical analysis MS Excel and SPSS 16 were used. **Results:** Among them 111 (55.5%) were boys and 89 (44.5%) were girls (Table 1). 112 (56 %) students were in the 13 to 14 years of age group . 64% children spending their time on screen for more than 3 hrs in a day were 36% spends less than 3hrs in a day. The pattern of fast food consumption, 90% students eat restaurant fast food regularly where as 10% never eat. 30.55% children had frequently fast food, 26.66% had occasionally whereas 26.11 % and 16.66 % had fast food once in a month and once in a week respectively. **Conclusions:** Health education on dietary habits and physical activity is needed for adolescent children to prevent development of obesity and complications related to it.

**Keywords** Obesity, School children

**Introduction:-**Childhood obesity is one of the most serious public health challenges of the 21st century. The problem is global and is steadily affecting many low - and middle-income countries, particularly in urban settings. Obesity is defined as an abnormal growth of the adipose tissue due to an enlargement of fat cell size (hypertrophic obesity) or an increase in fat cell number (hyperplastic obesity) or a combination of both. Obesity is a condition where a person has accumulated so much body fat that it might have a negative effect on their health.

India is the third most obese country in world. According to National Family Health Survey -3 15% of females and 14% males are considered obese in India. Some 14.4 million children in India are affected by obesity, and its occurrence is increasing rapidly.

The change in lifestyle, lack of physical activity and exercise, improper eating habits and lack of awareness about obesity has become a major problem of school going children. Childhood overweight affects self esteem and has negative consequence on cognitive and social development. Overweight and obese children are likely to stay obese into adulthood and more likely to develop non communicable diseases like diabetes and cardiovascular diseases at a younger age. Therefore Prevention of childhood needs high priority

### Need of the Study

- Worldwide, obesity trends are causing serious public health concern and in many countries threatening the viability of basic health care delivery.
- It is an independent risk factor for cardiovascular diseases and significantly increases the risk of morbidity and mortality.
- Childhood obesity is a global phenomenon affecting all socio-economic groups, irrespective of age, sex or ethnicity.
- The UN General Assembly's 2030 agenda for transforming our world comprised of 17 sustainable development goals (SDGs). Of these, target 3.4 of SDG 3 deals with reduction of premature mortality due to non-communicable diseases through prevention and control.
- The problem is global and is slowly acquiring epidemic proportions. In India too, the prevalence of overweight as well as obesity among children and adolescents has shown an increasing trend in all strata of society.
- It is because majority of today's children are living in obesogenic environment.
- Inclination to fast foods and sugar sweetened beverages and preference for screen games to outdoor games are leading to energy imbalance and increasing obesity which, once acquired, persists during adulthood and rest of the life.
- Childhood, therefore, is the critical time to detect overweight/obesity and start preventive action to ward off the scourge of non-communicable diseases.

**Methods:-**A cross sectional study was conducted in selected schools in Pune, Maharashtra, India on 200 school going children of 11 to 14 years of age group. The school children were randomly selected and with the help of structured questionnaire, all 200 students from selected age group were interviewed. Each interview was allotted maximum 7-8 minutes. Research tool comprised of questions about demographic characteristics, dietary pattern, family history, risk factors for obesity and frequency of having fast food. Body mass index was calculated for each participant by measuring weight and height with calibrated scales

**Results:-**In the present study, 200 school going children, aged between 11 to 14 years were interviewed through a structured questionnaire. Among them 111 (55.5%) were boys and 89 (44.5%) were girls (Table 1). 112 (56 %) students were in the 13 to 14 years of age group and 65 (32.5%) belongs to 6<sup>th</sup> std., 127 (63.5%) had non vegetarian. As per body mass index, 52 (26%) children were underweight, 90 were normal (45%) weight and 52 (29%) were obese (Figure 1) and (figure 2) 64% children spending their time on screen for more than 3 hrs in a day were 36% spends less than 3hrs in a day. In table 2 shows the pattern of fast food consumption, 90% students eat restaurant fast food regularly where as 10% never eat. 30.55% children had frequently fast food, 26.66% had occasionally whereas 26.11 % and 16.66 % had fast food once in a month and once in a week respectively

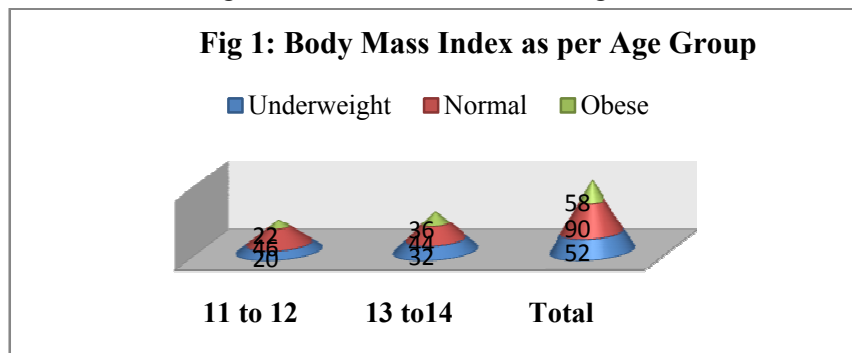
**Table 1: Demographic Variables**

Demographic variable	Freq	%
<b>Gender</b>		
Male	111	55.5%
Female	89	44.5%

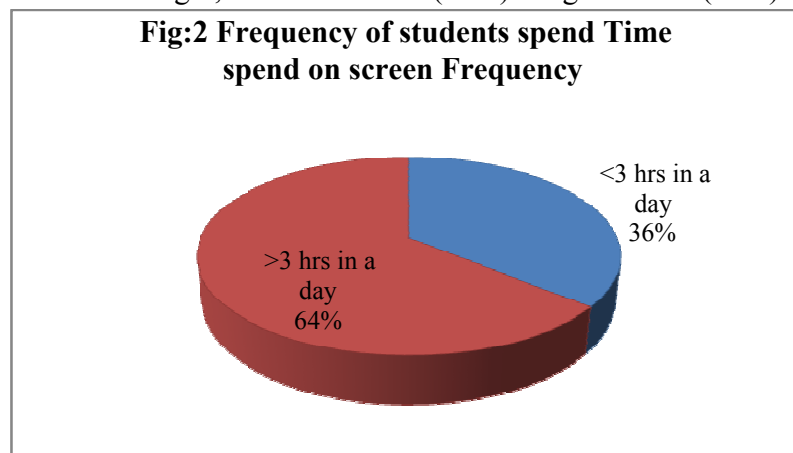
<b>Demographic variable</b>	<b>Freq</b>	<b>%</b>
<b>Age</b>		
11-12 years	88	44.0%
13-14 years	112	56.0%
<b>Class</b>		
6th	65	32.5%
7th	80	40.0%
8th	61	30.5%
<b>Education of father</b>		
Profession or honor	21	10.5%
Graduate or postgraduate	45	22.5%
Intermediate	51	25.5%
High school certificate	62	31.0%
Middle school certificate	18	9.0%
Primary school certificate	3	1.5%
<b>Education of mother</b>		
Profession or honor	14	7.0%
Graduate or postgraduate	33	16.5%
Intermediate	30	15.0%
High school certificate	73	36.5%
Middle school certificate	34	17.0%
Primary school certificate	11	5.5%
Illiterate	5	2.5%
<b>Monthly family income</b>		
More than 126,360	9	4.5%
63182-126,356	14	7.0%
47,266-63178	32	16.0%
31591-47262	73	36.5%
18,953-31589	36	18.0%
6327-18949	32	16.0%
Less than 6323	4	2.0%
<b>Diet</b>		
Vegetarian	73	36.5%
Non vegetarian	127	63.5%

- 55.5% of the school students were males and 44.5% of them were females.
- 44 % of them had age 11-12 years, 56% of them had age 13-14 years
- 32.5% of them were from 6th, 40% of them were from 7th, 30.5% of them were 8th
- 10.5% of their fathers had professional education, 22.5% of their fathers had graduation and post-graduation, 25.5% of their fathers had intermediate, 31% of them had high school certificate, 9% of them had middle school certificate and 1.5% of them had primary school certificate.

- 7% of their mothers had professional education, 16.5% of their fathers had graduation and post-graduation, 15% of their fathers had intermediate, 36.5% of them had high school certificate, 17% of them had middle school certificate, 5.5% of them had primary school certificate and 2.5% of them were illiterate.
- 4.5% of them had monthly family income more than Rs.126,360, 7% of them had family income Rs. 63182 -126,356, 16% of them had family income Rs. 47,266 -63178, 36.5% of them had monthly family income Rs. 31591-47262, 18% of them had monthly family income Rs.18953-31589, 16% of them had monthly income Rs. 6327 -18949 and 2% of them had monthly family income less than Rs.6323.
- 63.5% students had Non-vegetarian food and 73% had vegetarian food.



In fig no.1 Body Mass Index as per age group wise stated that As per body mass index, 52 (26%) children were underweight, 90 were normal (45%) weight and 52 (29%) were obese.



In figure 2. 64% children spending their time on screen for more than 3 hrs in a day were 36% spends less than 3hrs in a day.

**Table 2: Pattern of Fast Food Consumption**

Sr. No	Items	Frequency	Percentage (%)	
1.	Eat restaurant fast food regularly	Yes	180	90
		No	20	10
2.	How often eat fast food	Frequently	55	30.55
		Occasionally	48	26.66
		Once in a month	47	26.11
		Once in a week	30	16.66

In table 2 shows the pattern of fast food consumption, 90% students eat restaurant fast food regularly where as 10% never eat. 30.55% children had frequently fast food, 26.66% had occasionally whereas 26.11 % and 16.66 % had fast food once in a month and once in a week respectively.

**Discussion:-**The similar study was conducted on adolescent school children, it was observed that 51.2% participants were boys and mean BMI was 17.3Kg per meter square. The overall prevalence of overweight among adolescents was 9.9% and obesity was 4.8%. The prevalence of overweight was 9.3% among boys and 10.5% among girls; 5.2 and 4.3% were obese, respectively. According to the Body Mass Index cut off values, 23.9% were underweight, 60.6% were normal, 11.4% were overweight, and 4% were obese. The risk of overweight was 7.3 times higher among those who reported watching television and playing games on the computer for  $\geq 4$  hours/day. In another similar study done in Western Maharashtra, India. The aim of the study was to estimate prevalence of obesity and its risk factors in school students of age group 11 to 16 years. About 207 adolescent school children from selected school were enrolled in the study. Among participants 58.9% were boys. 66.7% students were in the 13 to 14 years of age group. As per body mass index, 46.9% children were underweight and 8.7% were obese. 77.3% participants were eating junk food more than once in a week.

**Conclusions:-**Childhood Obesity prevention training is the strategy to halt obesity problem in childhood. Families have the ability to influence and shape child behaviors on a daily basis. Therefore, experts suggest that family involvement in the prevention of childhood obesity may provide greater behaviour changes and sustainable weight loss over time compared to interventions without parental involvement.

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## HOW TO MAKE OYSTER MUSHROOM GOOD QUALITY SPAWN IN A SIMPLE WAY

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**ABSTRACT:**-According to the evaluation report, by **Research and Market** (The World's Largest Market Research Store) the overall worldwide trade of mushroom worth upto 16.7 billion dollars in the year 2020. The top six countries producing, or cultivating and harvesting Mushrooms of different varieties worldwide are China, Japan, US, UK, Germany, Poland .Oyster mushroom is second largest cultivat and produce in the world. Spawn quality is impor tant in the growth of good quality mushroom and this depends on the substrate quality and proper choice of the substrate. The quality of mushrooms spawn found in Rajasthan is of good quality. So on compute the results of substratesspawn preparation on myce lial growth of oyster mushroom species, the research wasconducted during factorial experiment design duplications. In this experiment, first and second factors respectively were substrates ( Wheat Variety -Raj 1482 Medium)) and oyster mushroom species (Pleur otus Florida). The results clearly demonstrated thatbetween various grain verity substrates used, maximum and minimum rate of growth were noted for Wheat Variety -Raj 1482 Medium and least mycelial extension and fresh weight on wheat. The financial side of nations, Mushroom farming and research should be encouraged and convincing altogether nations by surroundings up good spawn preparation centre. It for all time depends on the verity of any Grain to make a Spawn of fantastic quality at the species o f edible Mushroom.Hence by making good quality spawn of mushroom and training people, it can be a big contribution in the development of good income and agricultural growth for the country.

**Keywords:** Triticum aestivum, Plurotusflorida, mycelial growth, spawn grains.

**Introduction:** A mushroom is defined as the macrofungus with a particular plant part which can be either epigeous or hypogeous. The macrofungi have fruiting bodies large enough to be seen with the attention and to be picked up by hand” (Chang and Miles, 1992).

In 1866, its discovered by Giuseppe Inzengadescribed it as, “the most delicious mushroom within the world”Mushroom seed, commonly called “spawn” within the mushroom industry could also be a results of mycelial expansion.Mushroom grow ing using home -produced spawn could also be a process of cellular growth. Mushroom mycelium is primarily grown on a nitrified agar media. This is often often then used to make grain spawn. The grain spawn is subsequently used to make the final fruiting substrate.Oyster Mushroom

Species (Plurotous Florida Synonyms, P. ostreatus P. Columbinus, P. Florida, P. salignus , P. spodoleucus

Mushrooms are the crop of the mushroom plant, the mycelium. A mycelium could also be a perennially. This local mycelium only produces fruiting bodies, what are commonly called mushrooms, under optimum conditions of temperature , humidity and nutrition. For the leading part, the parent mycelium has but one alternative forinsuring the survival of the species: to release enormous numbers of spores. This is often often accomplishedthrough the generation of mushrooms.Naturally that makes it the foremost wanted and dear mushroom.



The home of using sundried oyster mushrooms for curing tuber culosis was initially experimented by German scientists who believed that tuberculosis is that the deadliest disease within the developing countries causing around 1.6 million deaths once a year. This is often actually because low -income countries lack the supply of adequate vitamin supplements . Therefore, oyster mushrooms are low -cost, easy to distribute and a superb source of Vit - D which could aid tuberculosis.Sundried oyster mushrooms stuffed in sandwich bread could be consumed as breakfast during the quantity of getting anti -TB drugs. Within the primary four months, you'll notice an enhancement within the immunological responses of the patient. vitamin D within the sun -exposed mushrooms stimulates the body to form an antimicrobial compound that's effective against bacteria causing tuberculo sis.The first indication of mushroom was in Vedic literature over 3000 years old.Soma panamthe drink just like whiskey,brandy,vodka of choice in royal courts, is believed to possess been distilled and diluted from poisonous mushroom.The scientist also said that mushroom, which is pure Vegetarian food, is nice for diabetic patients.Mushroom also has medicinal properties.It is good for stomach relate ailments like peptic ulceration and has high fiber content and no sugar. it is also rich in protein.

**Nutritive value of Fresh Oyster Mushroom:** -Calories 28cal\cup, Fat 1.79gm, Protein 2.9gm, Fiber 3 gm, Vit D 166.67%, Vit B2 23.0%, Vit B3 26.64% , Copper 23.33%, Vit B5 22.26%,Potassium 361mg, Vit B6 0.095 gm, Folate 33 mg ,Calcium 3.14 , Iron 3.40 , Niacin 7.72 ,CHO 5.66,Helps in maintain blood sugar, immunity, cardiovascular condition, and Skin and Brain.Aroundthe world: Temperate.WI.derIpread across Europe, North and Central America, and parts of Asia and Australia.

**The Mushroom Life Cycle:** -Cultivating mushrooms is one of the only ways to watch everything of the Mushroom Life Cycle. The life cycle first starts with a spore which produce a primary mycelium.When the mycelium originating from two spores mates, a resulting mycelium is produced. This mycelium continues to grow vegetatively. When vegetative mycelium has full-grown, its cells are able of aphenomenal rate of reproduction which culminates within the erection of mushroom fruit body. Their presents the last functional change and it's become, in effect, tertiary mycelium. These kinds of mycelia

Represent The Three major phases within the progression of the mushroom life cycle.Most mushrooms produce spores that are uninucleate and hereditarily haploid (1N). This means each spore contains one nucleus and has half the complement of chromosomes for the species. Thus spores have a "sex" therein each possesses to mate with mycelia from another spore Type to be fertile for producing offspring. When spores are first released they're fully inflated "moist" cells that can easily germinate. Soon they dehydrate , collapsing at their centers and through this phase they can sit dormant through long periods of dry weather conditions or severe drought. When climate provide a suitably humid environment, the spores rehydrate and fully increase. Only then is germination possible.Spores within a personal species are fairly constant in their shape and structure. How ever plenty of mushroom species differ remarkably in their spore types. Many are ellipsoid (as within the genus Psilocybe) while others are highly ornamented and irregularly shaped.A feature common to the spores of the various mushrooms, particularly the psilocybian species is that theformation of an apical germ pore.

**Material and Method:-**Sources of Materials: The mushroom species used for this research work were supplied by "Chaudhary Charan Singh Haryana Agricultural University" could also be a public funded agricultural university Hisar within the India state of Haryana.The grains used Wheat (Wheat Variety -Raj 1482 Medium).It was purchased from Jagdishprasad JhabermalTibarewala University Jhunjhunu District , 20 km From Rajasthan.Preparation of

culture medium: Potato Dextrose Agar (PDA) was running as medium of growth for culturing Pleurotus florid PDA was prepared as described by oxide manual. For one liter of the medium prepared 250g of peeled and sliced potatoes; 20g of Dextrose 15g of agar powder and one liter distilled water were used.



#### Fresh Mushroom Tissue Transfer

**Culture of fungus:** -Fresh cultures of Plurotus Florida were used with a sterilized razor; a little piece of the mushroom tissue was removed and placed on PDA medium in Petridishes. The inoculated dishes were incubated at 24 - 25 degree Centigrade for Twelve days. But first appear mycelim run before three days. Several sub -culturing were made until pure cultures were obtained.



#### Complete growth fresh mushroom tissue

**Spawn Preparation:** -1kg each of wheat seeds (Wheat Variety-Raj 1482 Medium) were wash in clean water 3 times to remove dust and other impurity, dust and other particles. The grains were then soaked in water for 24 hours for max inclusion of water. Waterlogged grains were again washed in water drained and put into spawn bottles. 4 of each spawn bottle were full of grains and mixed with 0.5% of calcium carbonate ( $\text{CaCO}_3$ ) M.W 10009 g/mol and a few of of calcium sulphate Hemihydrates Dried Extract Pure ( $\text{CaSO}_4 \cdot 0.5\text{H}_2\text{O}$ ) M.W 145.15 g/mol after which they were autoclaved at 121°C (at a pressure of 15 psi) for 1.30 hours. The grains within the bottles were then inoculate with nine mm mycelial discs per bottle (in triplicate of each grain type) under aseptic condition (Fasidi and Kadiri, 1993). These were incubated at 25 + 24°C. See plate three on nine day of incubation, wheat. Mycelia fresh weight (in grains) was Determined as follows:

Weight (wt) of bottle = xg

Weight of bottle and spawn grains = (X + Y)g

Weight of bottle + wt of spawn grains + wt of fresh

Mycelia = (X + Y + Z) g

Fresh mycelia wt. = (X + Y + Z)g – (X + Y)g = Zg

A Ruler was used to measure the mycelia extension.



**Five Days Sub Culture Run**

**Ten Day Run**

**Fifteen Day Sub Culture Run**

**Result and Discussion:-** Wheat (Wheat Variety -Raj 1482 Medium) was found to be most favorable to mycelia extension and mycelia fresh weight of *P. Florida*. The result of the examination of variance (figer 1, 2, 3, 4) showed that the mean mycelia fresh weight *P. Florida* is the foremost important species in which many commercial strains are developed and cultivated. *P. florida* have to be usually considered a subspecies of *P. ostreatus* but it will be discussed individually because its morphology and physiology are very different. The days taken for the completion of spawn run aside from Wheat spawn, where the spawn run took fortnight. Variations in spawn run rate could even be attributed to the sized of the grain. Smaller grains have a better number of inoculation points per kg than better grains. it had been found that the spawn run rate of smaller grains was above the larger grains. However larger grains have a better food reserve (Elliot, 1985) and should sustain the mycelium for extended periods of some time during stress (Fritsche, 1988). Thus differing kinds of spawn may influence productivity and growth.



**Four Days Mycelia Run**

**Nine Days Mycelia Run**

**Fourteen Days Mycelia**

**Conclusion:-** Mycelia growths of *P. Florida* -regime were faster. The good substrate for spawn preparation was wheat (Wheat Variety -Raj 1482 Medium) from the Northern Western a neighborhood of Rajasthan. As a result I recommend all to stand by Rajasthan by purchasing the primary suitable grain for spawn preparation as this might support the important role in manufacture of high quality and quantity of edible mushroom in India. Thanks to the play important role edible mushrooms in diet, waste management, fitness management; / medicine, environmental sustainability and potentials to strengthen the financial side of nations, Mushroom farming and research should be encouraged and convincing altogether nations by surroundings up good spawn preparation centre. It for all time depends on the verity of any Grain to make a Spawn of fantastic quality at the species of edible Mushroom.

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## A STUDY TO ASSESS THE PRACTICE SKILLS OF BANDAGING AMONG BSC NURSING STUDENTS IN SELECTED NURSING COLLEGE AT MYSURU.

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### ABSTRACT

**Introduction:** Bandaging is a basic procedure, but if carried out incorrectly it has the potential to cause considerable harm. Bandaging skills are essential for all nurses. It is important to be able to choose type, size and composition of bandage and then apply it safely using the most appropriate technique as incorrectly applied bandage may lead to pressure necrosis and subsequent limb amputation.

**Aim and Objectives :** The study aims to assess the practice skills of B.Sc. Nursing students regarding bandaging.

**Approach and design :** The descriptive study approach was used. Sampling and sampling criteria: Random sampling techniques were adopted to select 50 B.Sc. Nursing students in JSS College of Nursing at Mysuru.

**Tool and technique :** Structured practice checklist was used to collect the data. The data was analyzed using descriptive and inferential statistics.

**Result:-** Results revealed that all of the BSc Nursing students have good practice and none of them have poor practice regarding bandaging.

**Conclusion:-** It was concluded that the BSc Nursing students have Good practice skill regarding bandaging. Continuing educational programme can be conducted in nursing service area to update the practice skills regarding bandages.

**INTRODUCTION-** A bandage is a piece of material used either to support a medical device such as a dressing or splint, or on its own to provide support or to restrict the movement of a part of the body. When used with a dressing, the dressing is applied directly on a wound, and a bandage is used to hold the dressing in place. During heavy bleeding or following a poisonous bite, it is important to slow the flow of blood; tight bandages accomplish this task very well. Bandages are used to prevent or reduce edema or to prevent or reduce contracture. The bandage may be of cotton, jute, wool or special materials e.g. elastic bandage, crepe bandage. Most bandaging materials have a number of uses. However, some are preferred to the others because some are suitable for use on certain parts of the body and some are more expensive than the others. One can prefer the reusable bandages or disposable bandages according to the situation. Wound prevention and management can be challenging, particularly when the patient is living with complicating factors that may increase the risk of new wounds or prolong the healing of existing wounds. Taking care of wounds is a dynamic, complex process and requires specific knowledge of the nursing team. The value of compression in the healing of venous ulcers has been recognized for centuries, but it was not until the 1980s that increasing understanding of pathological process involved and improved methods of measuring sub bandage pressure allowed the development of a safe, effective, multilayer bandage system. Bandages can be applied only according to certain principles. The nurse should select appropriate size of the bandage because each of the body parts need different types of bandage. A carelessly or improperly applied bandage can cause discomfort to the patient and leads to further complications. Bandages should be removed before exercise, massage, and passive ROM exercises, the nurse should be aware of these things. Cotton bandages are most commonly used

to keep dressings in position. They are light and absorbent. They are cheap and can be discarded after a single use. Crepe bandages are thicker, stretchy bandage which can be washed and reused. It loses its ability to stretch after multiple uses. A thin elastic bandage is used for varicose veins and after an operation for varicose veins. The procedure applies to dressings that are done in the school, homes, centers or in an industrial health office. Proficient bandaging is an essential component of dressing retention for patients with friable or sensitive skin, as well as a method of supporting injured limbs. Skillful bandaging is also crucial for patients with venous leg ulcers. Poorly applied bandages are at best ineffective and expensive. At worst they can cause discomfort and pain or result in further injury. Other lesions particularly in rural areas where other medical services are not available. A cross-sectional observational study was conducted on the topic an observational study on wound dressing performance among nurses in adult units. The sample size was 41 nurses. The findings revealed that the mean score for nurse's adherence to correct wound management techniques was 77.6%. the study concluded that the educational course on wound management is beneficial to nurses. Wound care is a nursing duty that requires excellent skills and knowledge to prevent massive complications, such as infection, gangrene and amputation or in severe cases, even death.

**NEED FOR THE STUDY** :-In developed countries, every year a serious trauma experiences about 3% of the total population. Trauma affects significantly more males (more than 60%) of the total number of injured 4% of them being permanently disabled and 1.5% die. Treatment of injury depends upon its type and severity. Some injuries can be treated with basic first aid techniques such as wound cleansing; wound dressing, compression and elevation. Road traffic accident are a leading cause of mortality and morbidity globally. In India, more than a million are injured annually and about a lakh are killed in road traffic accidents. Surgical site infection is one of the second most common healthcare - associated infection. The study revealed that nurses reported a low level of knowledge and practice regarding the prevention of surgical site infection. There was a strong, significant positive correlation between knowledge and practice. In recent years; there have been tremendous advances in the design and composition of bandages and dressings. The field is becoming increasingly complex, and there are numerous reports of health care workers applying inappropriate products. The emergency bandage or Israeli bandage is a specially designed, first aid device that is used to stop bleeding from hemorrhagic wounds caused by traumatic injuries in pre hospital emergency situations. A descriptive study conducted on knowledge and practices of nurses regarding wound healing. The sample size was 393 nurses who worked at the surgical clinics of public and private hospitals. The findings revealed that mean score of knowledge regarding wound healing was found to be  $62.0 \pm 8.4$ . It concluded that educational level of the nurses increased, their knowledge mean score increased ( $p < 0.05$ ). Bandaging is a basic procedure, but if carried out incorrectly it has the potential to cause considerable harm. Bandaging skills are essential for all nurses. It is important to be able to choose type, size and composition of bandage and then apply it safely using the most appropriate technique as incorrectly applied bandage may lead to pressure necrosis and subsequent limb amputation. Bandaging application has changed little over last 100 yrs. A descriptive study was conducted on the topic to assess the practice skills of bandaging among nursing students of selected colleges of Pune city. The sample sizes of 60 students were selected using stratified random sampling technique. Data were collected using an observational checklist. The findings revealed that 75% students have adequate practice skills and rest 25% having inadequate skills of bandaging. The concluded that practice of bandaging is effective in improving the skills and accuracy among nursing students. A nurse competent in compression bandaging should possess



the following skills; show critical thinking and reasoning, escalate concern related to changes in the patient's clinical picture promptly, and assess if health outcomes are not being met. Correctly applied bandages do not cause injury to underlying and nearby body parts or create discomfort to the client.

**METHODOLOGY:**-Research methodology implies method for collecting, processing and analyzing the research data. This chapter deals with methodology adopted for this study. It includes type of research approach used, research design, the setting, the population, the sample, sampling technique, sampling criteria, development and description of tool, reliability of tool, pilot study, procedure for data collection and plan for data analysis.

**RESEARCH APPROACH:** Descriptive research approach. Research approaches implies a set of methods and techniques for designing a study and collecting and analyzing a data. As the main objective of the study to assess the practice skills of bandaging among BSc nursing students at selected nursing college at Mysuru.

**RESEARCH DESIGN: Descriptive research design**  
**VARIABLES**

**Independent variables:**-Practice skills of BSc nursing students

**Personal variables:**-Age, gender, class of BSc nursing, source of information

**SETTING OF THE STUDY:**-The study is conducted in JSS College of Nursing, Mysuru.

**POPULATION:**-In this study population refers to the number of college students who meets designed set of Criteria. College students are population.

**SAMPLE AND SAMPLING:**-A sample is the subset of population, selected to participate in a study. The sample for present study consists of 50 BSc nursing students studying in JSS College of Nursing, Mysuru.

**SAMPLING TECHNIQUE:**-Random sampling technique was used for the selection of the sample.

**SAMPLING CRITERIA**

**Inclusion Criteria:**-The B.Sc. nursing students who are Present during data collection Willing to participate in research study  
**Exclusion Criteria** The BSc nursing students who are Non co-operative during data collection.

**DATA COLLECTION INSTRUMENTS :-**The background factors were collected by using a structured baseline proforma prepared by the investigator. The practice skills on bandaging among BSc nursing students were assessed by using practice checklist

**SELECTION AND DEVELOPMENT OF DATA COLLECTION TOOL :-**This instrument selected in research should be the vehicle that would best elicit data for drawing conclusion pertinent to the study. Structured practice checklist was used for data collection in present study.

**DEVELOPMENT OF TOOL :-**The tool was developed by Reviewing research and non-research literature related to practice skills of bandaging among BSc nursing students and with the opinion and suggestion of experts.

**DISCRIPTION OF TOOL**

**SECTION A:** proforma for selected personal variables. It includes age in years, year of studying, and previous knowledge on bandage and practiced bandaging.

**SECTION B:** structured practice checklist. Structured practice checklist .The structured practice checklist.The tool consists of 18 items regarding practice skills of bandaging among B.Sc. nursing. There were 2 alternative responses for each item and each correct response given by the researcher was awarded a score of one and the wrong answer awarded with zero, the practice

skill score is ranges 6 -16. The score is further divided arbitrarily as follows: poor practice skill (0- 8), average practice skill (9-13) and good practice skill (14-18).

**CONTENT VALIDITY**:-Content validity is the degree to which the items or the instrument adequately represent the universe of content for the concept being measured. The research tool such as the proforma for selected personal variables, structured practice checklist, were content validated by 3 experts. Majority has given 100% agreement for all items of the research tool, except in personal variables so based on suggestion few items were deleted were incorporated and final tool was prepared.

**RELIABILITY**:-Reliability is the degree of consistency or dependency with which an instrument assessing quality and measures the target attribute which it is designed to measure. It is the major criterion for adequacy of an instrument. The reliability was established through split half method. The coefficient of correlation for structured practice checklist is 0.8 hence the tool was found to be reliable.

**PILOT STUDY**:-Pilot study is the small-scale trail run, one in preparation of main study setting selected for the pilot study was selected JSS College of Nursing, Mysuru. The pilot study was conducted on 19/11/2019 after taking permission from the consent authorities. The purpose of pilot study was to test the data collection instrument, to find out the feasibility of conducting the study and to decide upon the statistical analysis.

**PROCEDURE FOR DATA COLLECTION** :-Before the actual collection of data, the investigator met the Principal of JSS College of Nursing, Mysuru to obtain permission to conduct study in order to obtain a free and true response, the selected subjects were explained about the purpose and usefulness of the study and assurance about confidentiality of responses was also provided. A written consent to participate in the study was obtained. Data collection on 21/11/2019 the investigator took all care to look in to the convenience and comfort of the respondent. Necessary precautions were taken to provide privacy and confidentiality of the responses. All the selected students were met personally, consent was taken and data was collected. Approximately 10-15 minutes were taken each participant to complete the checklists.

**PLAN FOR DATA ANALYSIS** :-Data analysis is the systematic organization and synthesis of research data and testing of research hypothesis using those data. Data obtained was planned to be coded and edited to reduce the large data into master sheet. Both the descriptive and inferential statistics were planned to be used in this study.

**DISCRIPTIVE STATISTICS**:-• Frequency and percentage will be used to describe personal variable. • Mean, median and standard deviation will be used to analyze the practice skill scored among BSc Nursing students in selected nursing collage

**INFERENCEAL STATISTICS** :-• Chi -square to analyze the association between levels of practice skills regarding Bandaging with selected personal variables of BSc Nursing students

## **RESULTS**

**ANALYSIS AND INTERPRETATION OF DATA** :-Analysis is the process of categorizing, ordering and summarizing the data to obtain answers to research questions. This chapter deals with the analysis and interpretation of the data collected to determine the practice skills of bandaging among nursing students. The data were analyzed on the basis of study objectives using both descriptive and inferential statistics.

**ORGANIZATION OF FINDINGS**:-The collected data was entered to a master sheet, analyzed using descriptive and inferential Statistics and the findings are presented under the following headings:

**Section 1:** Description of selected personal variables of nursing students

a) Frequency, percentage, and distribution of nursing students according to their selected personal variables.

**Section 2:** Practice skills of nursing students regarding bandaging.

a) Description of level of practice skills of nursing students regarding bandaging

b) Mean, median, range and standard deviation of practice scores.

**Section 3:** Association between levels of practice skills of nursing students regarding Bandaging with their selected personal variables.

**SECTION 1 DESCRIPTION OF SELECTED PERSONAL VARIABLES OF NURSING STUDENTS-**The study sample compressed of 50 BSc nursing students. The selected personal variables of the subjects are age in years, year of study, and previous knowledge on bandage and practiced bandaging. The data related to the frequency and percentage distribution of sample according to their selected personal variables presented in table 1.

**TABLE 1** -Frequency and percentage distribution of BSc nursing students according to the selected personal variables

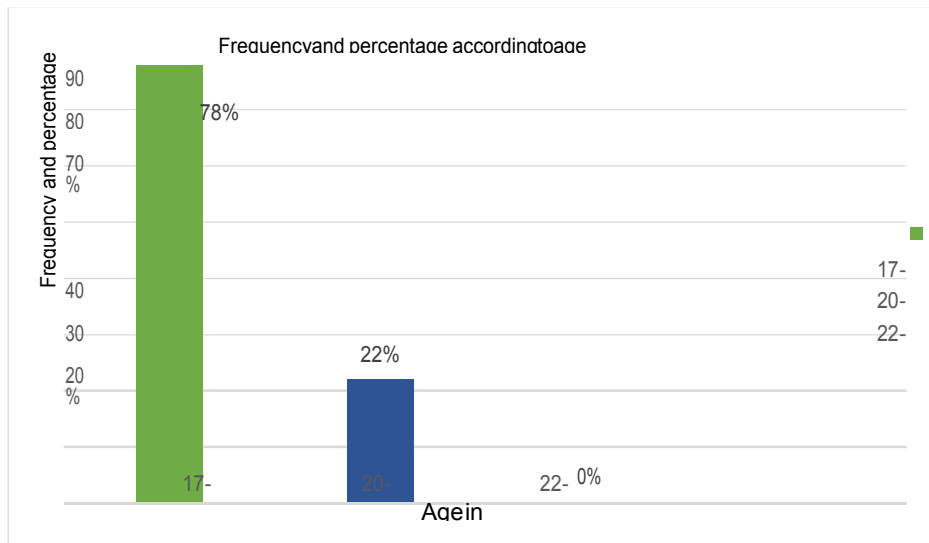
n = 50

**SECTION 1**

Sl.no	Sample characteristics	Frequency	Percentage (%)
1	<b>Age in years</b>		
	1.1. 17-19	39	78%
	1.2. 20-21	11	22%
	1.3. 22-23	0	0%
2	<b>Year of studying</b>		
	2.1. 1 <sup>st</sup> year	0	0%
	2.2. 2 <sup>nd</sup> year	50	100%
	2.3. 3 <sup>rd</sup> year	0	0%
	2.4. 4 <sup>th</sup> year	0	0%
3	<b>Previous knowledge on bandage</b>		
	3.1. Yes	50	100%
	3.2. No	0	0%
4	<b>Practiced bandaging</b>		
	4.1. On patient	12	24%
	4.2. On mannequin	38	76%

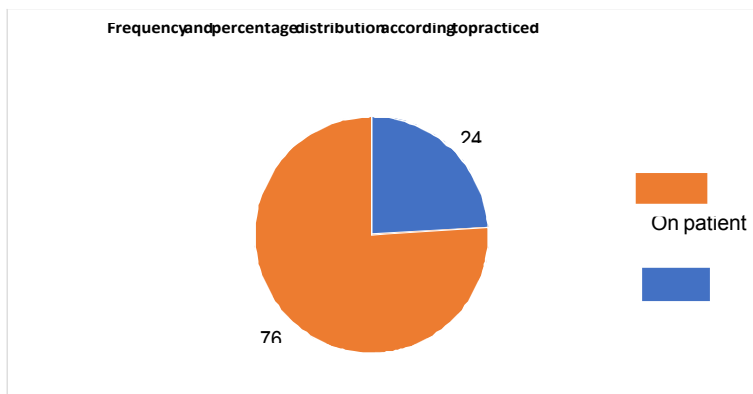
The data in the table 1 shows distribution of BSc Nursing students according to their age, year of studying, previous knowledge on bandage and practiced bandaging AGE IN YEARS:

**Fig 2: Frequency and percentage distribution of BSc nursing students according to their age**



**PRACTICED KNOWLEDGE**

**Fig 3: Frequency and percentage distribution of B .Sc. nursing students according**



**to their practiced bandaging.**

The data presented in table 1 and figure 4 shows that majority 76% were practiced on mannequin and 24% were practiced on patient were in B.Sc. Nursing students.

**SECTION 2**

**Practice skills of B.Sc. nursing students regarding bandaging**

Level of practice regarding bandaging among B .Sc. nursing students was assessed by using structured practice check list and frequency and per centage were computed. The findings are presented in table 2 and 3.

**Table 2**

**Frequency and percentage distribution score on practice regarding bandaging among BSc nursing students.**

n= 50

Practice skill	Frequency(f)	Percentage (%)
Poor practice skill	nil	0
Good practice skill	50	100

Table 2 shows that all of them having good practice and none of them having poor practice

**TABLE 3**

**Mean, median, range and standard deviation of knowledge score of the BSc nursing students**

	Mean	Median	Range	SD
Practice skill score	10.52	9	6-16	±1.5

The data presented in the table 3 shows that mean practice score of 10.52 with the standard deviation of  $\pm 1.5$  and ranges from 6-16.

### SECTION III

#### ASSOCIATION OF LEVEL OF PRACTICE SKILL OF BSc NURSING STUDENTS WITH THEIR SELECTED VARIABLES.

Chi square value was computed to find out the association of level of practice skill scored by BSc nursing students with their selected personal variable. The data are presented in table 4. To test the statistical significant following null hypotheses was stated.

**H<sub>0</sub>:** There will be no significant association between the practice skill score regarding bandaging among BSc nursing students and their selected personal variables

**TABLE 4**

**Chi square between the levels of practice skill of B.Sc. nursing students with selected personal variables.**

Selected personal variables	Good practice skill	Poor practice skill	Chi-square
<b>Age in years</b>			
17-19 years	3	5	1.581#
20-21 years	4	3	
	8		
<b>Practiced bandaging</b>			
On patient	1	2	12.72#
On mannequin	0	6	
	3		
	2		

$X^2(1) = 3.84$ ;  $P > 0.05$ ,  $P < 0.05$ , #- Yates correction

The data presented in table 4 shows that, there is association between practice skill score and their selected personal variables like age in years and practiced bandaging of BSc nursing students at 0.05 level of significance. So, the researchers reject null hypotheses and accept the research hypothesis.

## SALIENT FINDINGS OF THE STUDY

### FINDINGS OF THE STUDY

#### 1. Findings related to selected personal variables of BSc Nursing students

Findings in the present study showed that age group of the student's ranges from 17 -21. The majority 78% BSc Nursing students were in the age group of 17 - 19 years. Data revealed that 100% of BSc Nursing students have previous knowledge about bandaging. Majority 76% were practiced bandaging on mannequin.

#### 2. Findings related to association between practice skill score with selected personal variables of BSc Nursing students.

The computed chi -square value for association between practice score of BSc nursing students regarding bandaging with their personal variables were found to be significant at 0.05 level of significance. Hence, the researcher rejected the null hypothesis and accepted research hypothesis.

**IMPLICATION:-**The findings of present study implication for nursing practice, nursing education, nursing administration and nursing research.

**NURSING PRACTICE :-**There are several implications of the present study for nursing practice. The term bandage is often used synonymously. In fact, the term dressing refers more correctly to the primary layer in contact with the wound. A bandage is a piece of material used either to covering wounds, to keep the dressing place, to applying pressure controlling bleeding, to support a medical device such as a splint, or on its own to provide support to the body. It can also be used to restrict the part of the body.

**NURSING EDUCATION:-**Education is key component to update and improve the knowledge of an individual. Nursing educators can make sure that nursing students are gain knowledge regarding bandages used in hospitals. Nursing educators can supervise the students to conducting educational program regarding bandaging. Continuing educational program can be conducted in nursing service area to update the practice skills of staff nurses and nursing students regarding bandaging.

**NURSING ADMINISTRATION :-**Continuing education helps the nurse to update their knowledge and also helps in professional development. Nurse administrators should take interest to plan organize and conduct practice skills assessment regarding bandaging used in hospitals.

**NURSING RESEARCH:-**The topic has great importance in the present -day complexities of the health care system. The study has revealed that assessment of practice skills on bandaging among BSc nursing students is very important to assess the updated knowledge and also helps to assess the professional.

**LIMITATIONS:-**The limitations of the presented study were,

- 1.This study is limited to nursing students who are studying in JSS College of Nursing, Mysuru.
- 2.The sample size is limited to 50 BSc nursing students; hence it is limits the generalization of findings beyond study sample.
- 3.The standardized tool was not used in this study.

### RECOMMENDATION

1. Large scale study can be conducted to generalize the findings



2. A similar study can be conducted by adopting descriptive design
3. A descriptive study can be conducted on practice skills regarding bandaging used in hospitals among health care professionals.
4. A similar survey may be replicated on a large sample for better generalization of result.

**CONCLUSION:-**This dealt with brief summary of the study. The first section of this chapter summarizes the methodology with brief discussion on salient features of the study. The next section discusses the implications for nursing practice, education, administration and research; the limitations and recommendations.

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## STRESS, COPING STRATEGIES AND WORK LIFE BALANCE AMONG WORKING MOTHERS IN NURSING PROFESSION

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**ABSTRACT:-**Stress has number of immediate effects and if stressors are maintained it leads to long term effects on body. If these effects hinder adaptation to environment or create discomfort and distress, they themselves become stressors and tend to perpetuate cycle of distress. And some people develop ways to coping with stressors so that they are able to respond adaptively. This is wellness cycle. Working mothers undergo lot of stress in effort to balance their family and professional career. So researcher conducted descriptive study on stress and coping strategies among working mothers in nursing profession and to explore practices adopted by them to maintain balance between their family life and working life.

### INTRODUCTION-

**Significance of stress:-**In recent years, many studies have been done on stress that shows is bad mostly. They are quick to blame stress for whatever reason those lead to failure among them. Workshops/Seminars on stress management have sprung up almost everywhere. Stress is important part of everyone's lives.

**Stressors and stress:-**Since vast majority experience some level of stress on regular routine. For instance understudies are bound to confront circumstances and occasions that expect them to make changes and adjust their conduct according to circumstances. Certain individuals experience impacts of stress more lavishly than others since what is assessed as danger by one individual may be evaluated as happenstance for someone else. Stress causing occasions are called stressors; they can emerge out of inside individual or from outer source and can go from generally gentle to extreme indications. There are many kinds of stressors. They can be comprehensively named inside or outer stressors, or formative or situational stressors. Inner stressors begin inside individual like sensation of discouraged. Outer stressors start outside singular like tension from others, passing of relative or injury. Stressors additionally could be of two kind: those that cause distress, which happens when individuals experience horrendous stressors and those that cause eustress which results from positive occasions that actually set expectations for individual to adjust to change. Marriage, work advancement, having child may be in every way sure occasions for vast majority, however they all require extraordinary arrangement of progress in person's propensities, obligations and even way of life, along these lines making stress. Term eustress to portray stress experienced when positive occasions require body to adjust. It can likewise be altered as ideal measure of stress that individuals need to advance wellbeing and prosperity

Copying

Types of coping strategies

1. Appraised – focused strategies occur when person modifies way he/she thinks.
2. Problem focused coping is aimed at changing or eliminating source of stress.
3. Emotion focused strategies are directly managing or reducing emotional distress.

Coping is process rather than event. Individual may alternate between several of above coping strategies in order to cope with stressful event. Task oriented or direct coping focusses on

immediate problem and aims to change uncomfortable situation. They may be categorized as follows

- Attack (confrontation): in confrontation, all efforts are aimed at removing obstacles to goal. This could mean learning new skill or putting more effort.
- Withdrawal: Sometimes, withdrawal is only way of coping with stress and escaping from stress which cannot be overcome. Although this can shut door to other options, it may, at times be sensible and help people to move on in life.
- Compromise: This could mean accepting substitute goals or settling for something slightly different from their original plan.

Job stress among healthcare staff is becoming a common occurrence in most public health services (Winstanley and Whittington, 2002:303). In the high demand for effectiveness and efficiency of public health service delivery, nursing staff is placed on a high responsibility to ensure the demand of public citizen is satisfied (Ritter et al., 1995:164). Nursing focuses on activities that relate to diagnosis and treatment of human responses to health and illness phenomena. However, inherent in this caring occupations are numerous sources of built-in stress that become occupational hazards for nurses (Huber, 1996:560). There are many components to this experience of stress such as staff shortages, high level of responsibility, dealing with the death and the dying, dealing with patient's relatives, coping with the unpredictable, making critical judgment about interventions and treatment, and balancing between work and family commitments. These are forces that realistically generate stress.

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## Occupational stress and Coping strategies among staff nurses working in selected hospitals of a city

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### ABSTRACT

**Introduction:** - There is occupational stress in every profession. Nursing is essentially recognized as a stressful job and it has caused that stress to be one of the issue considered by the nursing profession. This study aimed at assessing stress level and determine the coping strategies used by the staff nurses to manage and cope with the occupational stress

**Method:-**The study was conducted as descriptive exploratory research on 60 nurses working hospital setting in 2019. Sampling technique used was convenient sampling technique Data were collected using modified Weimen occupational stress scale expanded nursing stress scale and questionnaire of coping strategies.

**Findings:-**Findings indicated that a majority of nurses have the moderate stress (66.67%) and mild stress is(8.33%) among nurses and (25%) have severe stress. The most commonly used coping strategy to deal with the occupational stress was found to be active confrontation.

**Results:-**Revealed that the percent of stress level was moderate (66.67%) adaptive stress coping strategies were more frequently used among sample.

**Conclusion:-**Based on findings of the study more than 50% of nurses have moderate stress level of occupational stress and most common coping strategy used was active confrontation. The study recommended that it is important for hospital management to find out sources of stress and coping strategies used by the staff nurses so that they can be helped to cope well with upcoming problems and situation. Stress management programmes can be organised for nurses to learn others ways to cope with stress.

**Key words:** - Occupational stress, Coping strategies, Staff nurses

**INTRODUCTION:-**There is occupational stress in every profession. Nursing is essentially recognized as a stressful job and it has caused that stress is to be one of the issue considered by the nursing profession. Nursing is generally perceived as a demanding profession. Along with the increasing demand of nurses and progress in the Nursing Profession, stress amongst the nurses has also increased. Nursing is a demanding occupation characterized by high work demands, the need to learn new technologies, to work to increasingly intensified schedule and to respond to emergencies. In addition to excessive working hours, shiftwork with its changing routine worsens stress, poor management and supervisory practices also contributes to stress outcomes. This research examined the stress among nurses working in different units and their coping abilities. Thus the current study is aimed at assessing the stress level, and to determine the use of coping strategies among the nursing staff. Nursing is generally perceived as a demanding profession. Along with the increasing demand of nurses and progress in the nursing profession, stress of the nurses has also increased.

**Need of the study:-**Nurses play a vital role in any health care institution and encompass the largest workforce in any health care institution. They act as direct caregivers and serve hospitals round the clock. This gives them a unique perspective on both patient care and hospital administration. A survey employed in Gaza-Palestine to study work

related stress among hospital nurses, using self-administered questionnaires on population of entire cohort of nurses who were working in 16 hospital in Gaza (1801 nurses; 985 males) indicated that the most severe work related stressors were; not enough staff to cover the unit adequately, lack of drugs and equipment required for nursing care and unpredictable staff. Severities of occupational stressors were significantly associated with the age, night shifts, specialization and qualification. Similarly many such studies had similar results which stated that nurses need to deal lot of occupational stress at their workplace

**Aim of the study:-**The main aim of the study was to assess the level of occupational stress among nurses and to explore the coping strategies adopted by nurses employed in selected hospitals of city. The study also aimed to find out association between occupational stress and demographic variables

**RESEARCH METHODOLOGY:-**The objectives of the study were 1) to assess the level of occupational stress among nurses employed in selected hospitals of Pune city. 2) to explore the coping strategies adopted by nurses employed in selected hospitals of Pune city 3) to find out the association between occupational stress among nurses and demographic variables. The study was Quantitative and qualitative in nature. The research design used for this study was descriptive exploratory research. The tool used for the present study was modified Weimen occupational stress scale and expanded nursing stress scale and questionnaire of coping strategies. The validity of tool was done by experts and reliability was calculated by conducting pilot study on six nursing staff in order to assess feasibility and appropriateness of the tool and it is estimated by correlation coefficient formula (0.8). The level of stress was decided based on the score of the nurses. Maximum score was 75 and minimum was 15. The three levels decided were mild, moderate and severe stress. Data was collected from 12<sup>th</sup> March 2019 to 17<sup>th</sup> March 2019 from selected hospitals of Pune city. Prior permission for the study was obtained from the hospital authorities. A total of six nurses were selected for this study using convenience sampling based on inclusion criteria. The investigators approached and introduced themselves to the samples and explained the objective and purpose of the study and confidentiality was ensured. Consent was obtained for willingness to answer the questionnaire. Majority of the respondents were cooperative. Data was collected with the help of the questionnaire to assess the occupational stress and coping strategies.



**FINDINGS** The findings of the study were discussed on basis of the objectives of the study.

**Findings related to level of occupational Stress:** It was revealed that majority of the nurses (66.67%) had moderate stress score (35-55), suggesting that they had moderate level of stress, (25%) of nurses had severe stress with a score of (56-75) and only (8.33%) of nurses had mild stress score (15-35). Findings related to coping strategies used by the staff nurses were Active



confrontation, Mastering mind and body, Avoidance / Displacement and Use of substance or beverages. In Active confrontation 88.3% respondents use good communication skills, 86.67% respondents manipulate their knowledge and skills to reduce stress when they are lacking, 65% respondents face the situation purposefully, 81.67% respondents show professional competency and face the situation and 85% respondents correct their wrong intervention immediately. In mastering mind and body coping strategy 76.67% respondents use spiritual ritual to distract themselves from stress, 60% respondents follow meditation and yoga to overcome stressful events, 78.33% respondents listen music overcomes stressful events, 21.67% respondents take some kind of medicine, drug, to overcome stressful events and 80% respondents follow some kind of hobbies to overcome stressful events. In avoidance or displacement coping strategy 86.66% respondents follow sleeping to reduce stress events, 71.67% respondents prefer to avoid the stressful situation and just let it go, 55% respondents isolate themselves in any stressful situation, 33.33% respondents displace their anger on someone else and 25% respondents show their anger tantrums outside their workplace. In beverages coping strategy 50% respondents follow some habit of drinking tea or coffee when they feel stressed, 11.67% follow the habits of alcohol consumption, 25% respondents take adequate tea or coffee of 6-7 glasses per day to reduce stress, 56.67% respondents avoid complete food or prefer some kind of hot or cold to keep their mind calm and 11.67% respondents drink alcohol every time to facing the stressful situation. Most common coping strategies adopted by nurses were active confrontation, to deal.

1. with occupational stress.

2. Findings related to association: There was no significant association with Demographic variables and level of occupational stress of the staff nurses.

**DISCUSSION:-**The study findings revealed that majority of the nurses had moderate stress which is an issue of concern as high level of stress can lead to burnt out syndrome among the nurses, hence it is recommended that more of stress management programmes should be conducted at the hospital to help nurses to deal with occupational stress effectively. Similar findings were observed in study conducted by Gulrani A, et al in 2014 occupational stress and job satisfaction among nurses which revealed that 42% of samples had severe stress. And that the stress alleviating program should be conducted for the nurses and personality training should be offered as well. Furthermore the coping strategy most commonly used was Active confrontation. This is supported by study conducted by Ahmed Adel Shadaifat, 2018 "Stress and coping strategies among nursing student where it was found that the most commonly used coping strategy among the nursing students was problem solving.

**CONCLUSION:-**Based on findings of the study more than 50% of nurses have moderate stress level of occupational stress and most common coping strategy used was active confrontation. It is concluded that nurses undergo through high levels of stress while working and do not have adequate information about coping strategies. Organizing stress management programmes will be useful for hospitals to help the nurses to deal with their stress

### **RECOMMENDATIONS**

On the basis of the findings of the present study, following recommendations for conducting further studies are made:

- The study can be replicated on a larger sample for generalization of the findings.
- An exploratory study can be conducted on identifying stressors leading to stress among nurses



- An experimental study can be conducted for developing stress adaptation and coping strategies module
- A similar study can be conducted considering other demographic characteristics of nurses and association with stress levels
- A comparative study can be conducted to compare stress levels in nurses working in hospitals and those working in teaching in stitution

## **Effectiveness of Health Education on knowledge regarding Sexual and Reproductive Health among Adolescent Girls Residing in Rural Area of Damoh, Madhya Pradesh.**

**Kamna Kadir Yusuf  
(Ph.D Scholar)**

**Abstract:**-Sexual and reproductive health problems are one of the major issues among adolescent girls and it causes serious health problems in future. A Pre -experimental study was conducted to assess the effectiveness of interventional sexual and reproductive health education on knowledge among adolescent girls. A pre experimental one group pre -test post -test design was adopted for the study. The study was conducted among 40 adolescent girls and the samples were selected by purposive sampling technique. A structured questionnaire was given to assess the knowledge of adolescent girls regarding sexual and reproductive health and then pre-structured intervention program was done and the post test was conducted by using same questionnaire on the seventh day.

The data was analyzed by descriptive and inferential statistics. The findings of the study show that on pre-test 70% was having average knowledge where as in the post-test 100% of adolescent girls had good knowledge regarding sexual and reproductive health.

**Keywords:-** Effectiveness, adolescent girls, sexual and reproductive health, health education.

**Introduction**–Adolescent is psychosocially and physically a unique individual with important implications for health and health care. Adolescents can be defined as the period from 10-19 years, a phase of transition from childhood to adulthood during which individual undergoes enormous physical and psychological changes. During this period the individual achieves an identity and undergoes rapid physical, cognitive, social and emotional maturation. Menarche is onset of menstruation and transition phase begins with general appearance of secondary sex characteristics like growing of pubic and axillary hairs, development of breast, mild fat deposition on hip muscles and development of shyness in nature at 11 or 12 years of age and ends with cessation of body growth at age 18 to 20 years.

**Need and the significance of the study:**-During the adolescent period they undergo tremendous changes in growth and development and thus they tend to be very impulsive during this transitional phase and often do experimentation and face serious sexual and reproductive health risk and issues. Several studies have been conducted with regard to physical and psychosocial problems among adolescent girls noted that there is inadequate knowledge among adolescent girls about the sexual and reproductive health and their body changes; hence the investigator felt the need to conduct a study to assess the effectiveness of sexual and reproductive health education on knowledge among adolescent girls.

### **Objectives –**

1. To assess the knowledge regarding sexual and reproductive health among adolescent girls.
2. To assess the effectiveness of health education regarding sexual and reproductive health on knowledge among adolescent girls.

### **Hypothesis –**

All hypotheses will be tested at 0.05 level of significance

**Null hypothesis**– The intervention does not have any effect on the knowledge regarding sexual and reproductive health among adolescent girls.

**Alternate hypothesis** – The intervention improves the knowledge regarding sexual and reproductive health among adolescent girls.

**Research design –**

Pre-test	Treatment or Intervention	Post-test
O1	X1	O2

O1	X1	O2
Pre-test: 30 multiple choice questions were given to adolescent girls regarding their knowledge on sexual and reproductive health.	Treatment or Intervention: Pre-structured health education given with the help of chart and flash cards on knowledge of sexual and reproductive health among adolescent girls.	Post-test: 30 multiple choice questions were given to adolescent girls regarding their knowledge on sexual and reproductive health.

**Material and method-**

- Research approach – Quantitative non experimental research approach.
- Research design- A pre-experimental one group pre-test post-test design.

**Variables –**

- Dependent variable – knowledge of adolescent girls on sexual and reproductive health.
- Independent variable – Pre-structured sexual and reproductive health education.

**Setting of the study –**

Target Population – Adolescent girls.

Accessible population – Adolescent girls residing in Damoh, madhyapradesh.

Sample - Adolescent girls between 13-16 years of age group.

Sample size – 40 adolescent girls.

**Sampling technique –**

- Purposive sampling technique tools and instruments.

Tool 1:

- Section A: Demographic profile.
- Section B: Knowledge questionnaire on sexual and reproductive health.

Tool 2:

- Intervention health education on sexual and reproductive.

[Includes anatomy and physiology of female reproductive system, puberty, changes during puberty, menstruation, menstrual hygiene, ovulation, fertilization, contraception, emergency contraception, anemia, psychological problems (mood swings) its symptoms and management, good touch and bad touch.]

**Data Collection Process:** -Ethical clearance was obtained from the institutional ethical committee. A formal permission was obtained from the Sarpanch and informed consent was taken from the participants to conduct the study. Data collection was conducted for a period of one week from rural area of Damoh, madhyapradesh. A purposive sampling technique was used to select the study subjects. The data was collected from 40 adolescent girls who met the inclusion criteria. An informed consent was obtained from the participants. They were given a structured questionnaire and the allotted time used for completing the structured questionnaire between 20-30 minutes. The intervention in the form of health education was given on the very same day. The post test was conducted on the 7<sup>th</sup> day by administering the same pre-test questionnaire.

**Results – Organization of study findings**

- Section A: Description of demographic variables of adolescent's girls
- Section B: Description of level knowledge of adolescent girls regarding sexual and reproductive health.

- Section C: Effect of interventional sexual and reproductive health education in terms of gain in knowledge score.

Section A: Description of demographic variables of adolescent girls.

Sociodemographic data: - Majority (52.5%) of sample belongs to the age 13 years and 47.5% belongs to the age 14 years.

- Among 40 adolescent girls studied 57.5% belongs to Hindu community 22.5% in Muslim community and 20% in Christian community.
- Majority (47.5%) of months of adolescent girls had completed higher secondary education 27.5% of them are graduated and 25% completed their primary school education.
- Out of 40 samples 20% of them had menarche at the age group 10-11 years and 80% of them had menarche at the age of 12-16 years.

Section B: Description of level of knowledge of adolescent girls regarding sexual and reproductive health.

**Table 1:** Frequency and percentage distribution of level of knowledge of adolescent girls regarding sexual and reproductive health.

n=30

Level of knowledge	Pretest score		Post test	
	Frequency (f)	Percentage %	Frequency (f)	Percentage %
Good	12	30	40	100
Average	28	70	0	0
Poor	0	0	0	0

The data presented in table 1 reveals that in the pre -test (30%) of adolescent girls have good knowledge and (70%) have average knowledge whereas in post -test (100%) of adolescent girls have good knowledge regarding sexual and reproductive health.

**Table 2:** Mean, Median, Standard deviation and range of pre -test and post -test and knowledge scores of adolescent girls regarding sexual and reproductive health.

n=30

Knowledge score	Mean	Median	Mode	Standard deviation
Pretest score	18.25	18	18.6	11
Post test	23.45	23	23.4	7

\*Significant at 0.05 level

**Table 2:** Shows that mean post -test knowledge score was (23.45) higher than the mean pre -test knowledge score (18.25). Post -test standard deviation is (7) lower than the pre -test standard deviation (11) hence null hypothesis was rejected and research hypothesis was accepted. Thus intervention (health education) is effective.

Section C: Effect of interventional sexual and reproductive health education in gaining knowledge score.

**H 1** –There will be significant difference between pre -test and post test scores of knowledge regarding sexual and reproductive health among adolescent girls.

- Paired t test showing significant difference between pre -test and post -test level of knowledge of adolescent girls on sexual and reproductive health.

**Table 3:** t value between the pre-test and post-test score:

Level of knowledge	Mean	Standard deviation	Mean difference	t	df	Table value
Pre-test	18.25	18.6	5.2	10.2	39	2.13
Post-test	23.45	23.4				

\*Significant at 0.05 level

**Table 3:** Shows that calculated t value (10.2) is greater than table value (2.13) at the significance of 0.05 level. There is significant increase in the mean post-test knowledge scores of adolescent girls on sexual and reproductive health. Hence it is inferred that the interventional health education is effective in increasing the knowledge scores of adolescent girls regarding sexual and reproductive health.

So, research hypothesis is accepted.

**Discussion:** The present study revealed that 28 (70%) of adolescent girls have average knowledge regarding sexual and reproductive health which has been compared with a study conducted by Borker R, C G Patil and S. Meshram: A study to assess the knowledge of higher secondary school students regarding reproductive health. The results showed that 75% of the adolescent girls had an adequate knowledge regarding menstrual hygiene and other reproductive health practices.

**Conclusion:** Adolescence is a critical life stage where rapid physical, emotional and psychological changes occurs which create a strange state of mind in the adolescents. They grow extremely sensitive, at times they experience a sense of embarrassment so knowledge regarding their period of life is essential so as to bring about a good sexual and reproductive health. The study shows a significant difference in the mean post-test and pre test scores Hence it is inferred that interventional health education was effective in increasing the knowledge scores of adolescent girls regarding sexual and reproductive health.

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## **A study to assess Quality of life and well being among Geriatric Population at Selected old Age Homes,Bangalore**

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### **Abstract:**

#### **Background**

Aging is a critical period in human life; thus, focusing on its needs is a social necessity. Most of the old people have chronic diseases, which make their lives unmanageable, put their independence at risk, and decrease their health-related quality of life (QOL). It makes how much impact on the quality of life and well being geriatric population the present study was conducted to assess quality of life and well being among geriatric population residing at selected old age homes. The quality of life and well being in respondents was assessed by using WHOQOL - BRIEF scale and General Well Being scale - Standardized self administered questionnaire. The study revealed that the quality of life shows that had High perceived Qol and moderate perceived Qol and well being shows that had serious, distress, and stress problem.

#### **INTRODUCTION**

The concept of “old” has changed drastically over the years. As civilization developed, mortality rates remained high as a result of periodic famine and frequent malnutrition. Population ageing is one of the most important global trends of the 21<sup>st</sup> century and the issue has started receiving much attention from the public, media and policy makers. The 21<sup>st</sup> century is widely being considered the century of elderly persons; the 22<sup>nd</sup> century is expected to witness the phenomenon of the ‘ageing of the aged’.

#### **OBJECTIVES**

1. To assess the quality of life and well being among geriatric population residing at selected old age home.
2. To find out the association between quality of life and well being scores with selected Socio demographic variables.
3. To find co-relation between quality of life and well being of geriatric population.

#### **HYPOTHESES:**

- H1-There will be significant association between the level of quality of life with their selected socio demographic variables.  
H2-There will be significant association between the level of well being with their selected socio demographic variables.  
H3-There will be significant co -relation between the level of quality of life and well being of geriatrics population.

**METHODOLOGY:-**Descriptive survey design was included geriatric population of 100 in the age group 60yrs and above to assess quality of life and well being among geriatric population at selected old age homes, Bangalore. The Demographic variable in this study are age (in years), gender, religion, education, type of family, marital status, occupation, income, duration of staying and any significances of illness. The present study was conducted in selected AsakthaPoshakaSabha. Purposive sampling technique is used for selecting the samples.

#### **SAMPLING CRITERIA:-**

#### **INCLUSION CRITERIA:**

Geriatric population who are willing to participate in the study.



**EXCLUSION CRITERIA:**

Geriatric population, who are bed ridden and not able to take care of themselves.

**DELIMITATIONS OF THE STUDY:**

1. The study sample taken is limited only from old age homes.
2. The study is limited to geriatric population who are living in Bangalore

**DEVELOPMENT OF THE TOOL**

After an extensive review of literature, discussion with the guide and various experts in the field psychiatric nursing, a self administered standardized WHOQOL -BRIEF and General Well-being scale was used to assess quality of life and well being among geriatric population was developed. A blue print of 44 items was developed to assess the quality of life and well being. Then the prepared items were subjected to content validation, pre testing and estimation of reliability.

**DESCRIPTION OF THE TOOL**

In the present study the tool consist of three sections.

Tool consists of three sections.

- 1) Section – A
- 2) Section – B
- 3) Section – C

Section –: A Demographic data

This section consists of 10 items pertaining to geriatric population are age (in years), gender, religion, education, type of family, marital status, occupation, income, duration of staying and any significances of illness

Section - B: WHOQOL-BRIEF scale to assess Qol.

This section consists of 26 items to assess Qol. The geriatrics populations were asked to mark their feeling of Qol for the items mentioned in the tool based on a five point scale. Scores given for categories were, 5, 4, 3, 2 and 1 the maximum score is 130.

Section - C: General well being scale to assess well being.

This section consists of 18 items to assess well being. The geriatrics population were asked to mark their feeling of well being for the items mentioned in the tool based on a five point scale. Scores given for categories were, 5, 4, 3, 2 and 1 the maximum score is 110.

**RELIABILITY OF THE TOOL**

Reliability is defined as the degree of consistency or dependability with which an instrument measures the attribute it is designed to measure

After validation, the tool was subjected to test for its reliability. The questionnaire was administered to 10 geriatric populations. In order to establish the reliability of the tool, test -retest method was used. The reliability coefficient of the tool was estimated by the Karl's Pearson formula. A reliability coefficient value for Qol was found to be 'r' = 0.88 and a reliability coefficient value for Well being was found to be 'r' = 0.80 which indicated that the tool was reliable and feasible.

**DATA COLLECTION PROCEDURE**

After obtaining formal permission from the secretary and president of the Asaktha Poshaka Sabha, V.V Puram, Bangalore the study was conducted by purposive sampling technique. The investigator gave self introduction, explained the purpose of the study and the subjects willingness to participate in the study was ascertained. The subjects were assured anonymity and confidentiality of information provided by them and a written informed consent was obtained. The questionnaires were given to 100 geriatric populations and instructed to mark their responses

according their own personal opinion. All the questionnaires were collected back after completed the questionnaire

## Results.

### Association between Demographic variables and Quality of life level and General well being

TABLE – Association between Demographic variables and Quality of life level

Demographic Variables	Category	Sample	Quality of life Level				$\chi^2$ Value	Df Value	P Value & table value
			Moderate		High				
			N	%	N	%			
Age group (years)	60-65	30	13	43.3	17	56.7	3.44 NS	2	P>0.05 (0.179) (5.991)
	66-70	30	7	23.3	23	76.7			
	71+	40	17	42.5	23	57.5			
Gender	Female	64	14	21.9	50	78.1	17.45 *	1	P<0.05 (0.000)(3.841)
	Male	36	23	63.9	13	36.1			
Religion	Hindu	86	30	34.9	56	65.1	5.28 NS	2	P>0.05 (0.072) (5.991)
	Christian	3	3	100.0	0	0.0			
	Others	11	4	36.4	7	63.6			
Educational qualification	No formal education	21	9	42.9	12	57.1	1.79 NS	4	P>0.05 (0.774) (9.488)
	Primary	48	16	33.3	32	66.7			
	Secondary	20	7	35.0	13	65.0			
	PUC	5	3	60.0	2	40.0			
	Graduation	6	2	33.3	4	66.7			
Type of Family	Nuclear	59	28	47.5	31	52.5	6.75*	1	P<0.05 (0.009) (3.841)
	Joint	41	9	22.0	32	78.0			
Marital status	Married	48	19	39.6	29	60.4	1.41 NS	2	P>0.05 (0.495)(5.991)
	Unmarried	34	10	39.4	24	70.6			
	Widow/Widower	18	8	44.4	10	55.6			
Previous occupation	Daily labor	24	19	79.2	5	20.8	27.13 *	4	P<0.05 (0.000)(9.488)
	Home maker	46	9	19.6	37	80.4			
	Government job	3	1	33.3	2	66.7			
	Private job	14	6	42.9	8	57.1			
	Business	13	2	15.4	11	84.6			
Income from any source/month	No	38	7	18.4	31	81.6	11.04 *	2	P<0.05 (0.004) (5.991)
	<Rs.10,000	48	21	43.8	27	56.2			
	>Rs.10,000	14	9	64.3	5	35.7			
Duration of staying in old age home	<1year	14	7	50.0	7	50.0	10.97 *	3	P<0.05 (0.012)(7.815)
	1 year	5	1	20.0	4	80.0			
	2 years	16	11	68.8	5	31.2			
	> 2 years	65	18	27.7	47	72.3			
Significances of illness	Yes	40	14	35.0	26	65.0	0.11 NS	1	P>0.05 (0.735) (3.841)
	No	60	23	38.3	37	61.7			
Combined		100	37	37.0	63	63.0			

\* Significant at 5% Level,

NS: Non-significant

The above table -16 shows the association between level of Quality of life with selected demographic variables. It is evidence from the above table that there is significant association between Quality of life and the variables like gender, type of family, previous occupation, income from any source/month and duration of staying in old age home. Hence research

hypothesis  $H_1$  is accepted for those variables and there is no association between Quality of life and other variables like age group (years), religion, educational qualification, marital status and significances of illness.

Hence research hypothesis  $H_1$  is rejected for age group (years), religion, educational qualification, marital status and significances of illness.

### Association between Demographic variables and General well being level

N=100

Demographic Variables	Category	Sample	Well being Level						$\chi^2$ Value	df Value	P Value
			Distress		Stress		Marginal				
			N	%	N	%	N	%			
Age group (years)	60-65	30	8	26.7	10	33.3	12	40.0	6.26 NS	4	P>0.05 (0.181) (9.488)
	66-70	30	4	13.3	17	56.7	9	30.0			
	71+	40	14	35.0	15	37.5	11	27.5			
Gender	Female	64	13	20.3	24	37.5	27	42.2	8.84*	2	P<0.05 (0.012) (5.991)
	Male	36	13	36.1	18	50.0	5	13.9			
Religion	Hindu	86	24	27.9	35	40.7	27	31.4	1.97 NS	4	P>0.05 (0.214) (9.488)
	Christian	3	1	33.3	1	33.3	1	33.3			
	Others	11	1	9.1	6	54.5	4	36.4			
Educational qualification	No education	21	3	14.3	8	38.1	10	47.6	6.64 NS	8	P>0.05 (0.576) (15.507)
	Primary	48	14	29.2	20	41.7	14	29.2			
	Secondary	20	5	25.0	10	50.0	5	25.0			
	PUC	5	1	20.0	3	60.0	1	20.0			
Type of Family	Nuclear	59	19	32.2	18	30.5	22	37.3	7.91*	2	P<0.05 (0.019) (5.991)
	Joint	41	7	17.1	24	58.5	10	24.4			
Marital status	Married	48	16	33.3	21	43.8	11	22.9	6.29 NS	4	P>0.05 (0.179) (9.488)
	Unmarried	34	6	17.6	16	47.1	12	35.3			
	Widow (er)	18	4	22.2	5	27.8	9	50.0			
Previous occupation	Daily labor	24	12	50.0	10	41.7	2	8.3	17.51 *	8	P<0.05 (0.042) (15.507)
	Home maker	46	7	15.2	17	37.0	22	47.8			
	Government	3	0	0.0	2	66.7	1	33.3			
	Private job	14	4	28.6	7	50.0	3	21.4			
	Business	13	3	23.1	6	46.1	4	30.8			
Income from any source/month	No	38	4	10.6	17	44.7	17	44.7	13.86 *	4	P<0.05 (0.008) (9.488)
	<Rs.10,000	48	14	29.2	20	41.7	14	29.2			
	>Rs.10,000	14	8	57.1	5	35.7	1	7.2			
Duration of staying in old age home	<1year	14	2	14.3	9	64.3	3	21.4	4.21 NS	6	P>0.05 (0.648) (12.592)
	1 year	5	2	40.0	2	40.0	1	20.0			
	2 years	16	4	25.0	7	43.8	5	31.2			
	> 2 years	65	18	27.7	24	36.9	23	35.4			
Significances of illness	Yes	40	6	20.0	15	37.5	19	47.5	8.43*	2	P<0.05 (0.015) (5.991)
	No	60	20	33.3	27	45.0	13	21.7			
Combined		100	26	26.0	42	42.0	32	32.0			

\* Significant at 5% Level,

NS: Non-significant

The above table -17 shows the association between level of General well being with selected demographic variables. It is evidence from the above table that there is significant association between General well being and the variables like gender, type of family, previous occupation, income from any source/month and significances of illness. Hence research hypothesis  $H_2$  is accepted for those variables and there is no association between General well being and other variables like age group (years), religion, educational qualification, marital status and duration of

staying in old age home. Hence research hypothesis  $H_2$  is rejected for age group (years), religion, educational qualification, marital status and duration of staying in old age home.

**CONCLUSION:-**The correlation between WHOQOL and General well being score “r”= +0.647 of respondents shows that there were strong positive correlation between WHOQOL and General well being. The association between level of Quality of life with selected demographic variables shows that there is significant association between Quality of life and the variables like gender, type of family, previous occupation, income from any source/month and duration of staying in old age home. Hence research hypothesis  $H_1$  is accepted for those variables and there is no association between Quality of life and other variables like age group (years), religion, educational qualification, marital status and significances of illness. Hence research hypothesis  $H_1$  is rejected for age group (years), religion, educational qualification, marital status and significances of illness. The association between level of General well being with selected demographic variables shows that there is significant association between General well being and the variables like gender, type of family, previous occupation, income from any source/month and significances of illness. duration of staying in old age home. Hence research hypothesis  $H_2$  is accepted for those variables and there is no association between General well being and other variables like age group (years), religion, educational qualification, marital status and duration of staying in old age home. Hence research hypothesis  $H_2$  is rejected for those variable

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**A STUDY TO ASSESS THE EFFECTIVENESS OF STRUCTURED  
TEACHING PROGRAMME ON KNOWLEDGE OF ADOLESCENT  
REGARDING TATTOOING AND ITS HEALTH HAZARDS AT  
SELECTED PRE UNIVERSITY COLLEGE OF BANGALORE URBAN  
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**ABSTRACT:-**In the art of tattooing, colored ink is inserted into the body through the layers of skin. The result is a change of the skin pigment. The factors influencing are externalized risk behaviors such as multiple drug use, illegal activities, problem gambling, school truancy and rave attendance. It results in health risk such as severe skin reactions, permanent malfunction of different organs or risk for transmission of blood borne infections. The treatment is application of contractubex gel for scar prevention, laser removal, surgical excision or dermabrasion. Tattooing in adolescent can serve as a useful easily visible, clinical marker; that may identify adolescents who are at higher risks for engaging in risk behavior. The leading cause of death and disability among adolescents are preventable. A Quasi experimental design was conducted to determine the potential risky behaviours of adolescent. The objective of the report was to identify the high risk behaviours and to create awareness.

**KEY WORDS:** Demographic Study, Tattooing, Health Hazards

**INTRODUCTION:-**Adolescence is a period of transition between childhood and adulthood, a time of profound biologic, intellectual, psychological and economic changes. Adolescence is a time for natural experimentation because in this phase of development they are curious and adventurous. Risky behavior can lead to accidental injuries, addictions, substance abuse and violence which are closely interrelated. The accidental injuries may be of drug addictions, piercing or tattooing. In past two decades there is an increase in the frequency of tattooing especially in younger adolescents which may be performed by self or a friend, obtained commercially with or without parental permission or approval. Types of tattoos are abstraction, naturalistic, dedication, simplification tattoos and complex tattoos. The people who undergo tattoo are at risk for scar including hard keloids, bacterial skin infections, and allergic reactions to dyes, hepatitis B and C, HIV /AIDS and bleeding. A healthy environment provides both support and opportunities for their healthy developments. Screening and education may prevent health problems during this period. The goals of nursing care include early detection of physical, emotional and behavioural problems. Clinicians who are trained in adolescent health guidelines and are provided charting tools for documentation improve the screening and counseling addressing high risk behaviours at preventive care visits. With personal interest and on the basis of reviews, the researcher felt that there is a need to assess the knowledge and to create awareness among adolescents on tattooing and its health hazard.

**OBJECTIVES**

1. To assess the knowledge of adolescent regarding tattooing and its health hazards.
2. To determine the effectiveness of structured teaching program on tattooing and its health hazards among adolescent.
3. To find the association between knowledge of adolescent regarding tattooing and its health hazards with the selected socio demographic variables.

**Methods and Materials:** -The conceptual framework for the study is based on general systems theory by Ludwig Von Bertalanffy in 1969. The study is based on quantitative approach; Quasi experimental (pre test –post test control group design) was used for the collection of the data. A

self-administered questionnaire was used to collect data. Pilot study was conducted 15/06/2021 to 17/06/2021 among 10 samples at Sheshadripuram pre University College and C B Bhandari Jain College Bangalore, to find out feasibility of study. The main study was also conducted at the Chetana pre University College and Nagarjuna pre university college Bangalore, from 05/07/2021 to 13/07/2021 among 60. They were selected by convenient sampling technique who met the inclusion criteria. The collected data was analyzed and interpreted using descriptive and inferential statistics.

## RESULTS:

### Distribution of samples according to knowledge level on tattooing and its health hazards (control group).

Knowledge Level	Classification of Samples			
	Pre-test		Post-test	
	Frequency(f)	Percent (%)	Frequency(f)	Percent (%)
Inadequate (<50%)	24	80.0	20	66.67
Moderate (50%-75%)	6	20.0	8	26.67
Adequate (>75%)	0	0.0	2	6.66
Total	30	100.0	30	100.0

The above table reveals that majority (80.00%) of samples had inadequate knowledge; 20.00% had moderate knowledge and none of them had adequate knowledge regarding tattooing and its health hazards in the pre-test. In the post-test, majority (66.67%) of the respondents had inadequate knowledge; 26.67% of the samples had moderate knowledge and 6.66% had adequate knowledge about the topic.

### Distribution of samples according to knowledge level on tattooing and its health hazards (Experimental group).

Knowledge Level	Classification of Samples			
	Pre-test		Post-test	
	Frequency(f)	Percent (%)	Frequency(f)	Percent (%)
Inadequate (<50%)	25	83.33	4	13.33
Moderate (50%-75%)	5	16.67	8	26.67
Adequate (>75%)	0	0.0	18	60.0
Total	30	100.0	30	100.0

The above table reveals that majority 83.33% of samples had inadequate knowledge; 16.67% had moderate knowledge and none of them had adequate knowledge regarding tattooing and its health hazards in the pre-test. In the post-test, majority 60.00% of the respondents had adequate knowledge; 26.67% of the samples had moderate knowledge and 13.33% of them had adequate knowledge about the topic.

### Analysis of pre-test and post-test knowledge scores.

Groups	Pre-test		Post-test		Paired t-value
	Mean	SD	Mean	SD	
Control group	16.26	4.08	19.10	5.17	6.296
Experimental group	13.86	4.36	27.70	4.65	13.785

The calculated "t" value is 6.296 in control group which is greater than the table value 2.0452 at 0.05 level of significance. As there is increase in knowledge scores among students on tattooing



and its health hazards without the structured teaching programme, there is an influence of external variables in terms of gain in knowledge among adolescents.

The calculated "t" value is 13.785 in experimental group which is greater than the table value 2.0452 at 0.05 level of significance. As there is increase in knowledge scores among students on tattooing and its health hazards after administering the structured teaching programme, the teaching programme on tattooing and its health hazards was effective in terms of gain in knowledge among adolescents.

#### **Findings related to association between pre-test knowledge scores with selected demographic variables:**

Among the demographic variables analyzed in this study all variables is found to have statistical significant association with knowledge scores.

**CONCLUSION:-** This study was done to determine the effectiveness of structured teaching programme on knowledge of Adolescents regarding Tattooing and its Health Hazards. The result of this study shows that there is an improvement in knowledge of Adolescents after the teaching programme. The structured teaching programme plan prepared for this study will help the nurses to teach and motivate the Adolescents to carry out healthy practices. Nurses have the important role in observation of a tattoo during physical examination of an adolescent which prompt a more intensive assessment for high risk behaviors and subsequent counselling during clinical office visits.

#### **RECOMMENDATIONS:**

On the basis of the findings of the study following recommendations have been made:

- A similar study may be conducted on a larger sample for wider generalization.
- A similar study may be conducted in other backward districts, taluks, villages etc.
- Manuals, information booklets and self-instruction module may be developed.
- The comparative study can be conducted on adolescents of urban colleges and rural colleges.
- The similar study may be replicated among degree college students.
- A long term study can be done to assess the impact of tattooing and its health hazards.

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## Impact of Fungal Aerospora on Crop Production: A Comprehensive Review

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**Abstract:**-Aerobiology is a part of science that reviews natural particles, like microorganisms, contagious spores, tiny creepy crawlies, dust grains and infectious particles, which are latently moved by the air. The aerobiological perceptions are valuable to decipher measures continuing in science, meteorology and nature yet in addition these disciplines are of extraordinary assistance in comprehension of aerobiological measures. Aerospora are wide spread all around the world and high ecological weights have been influenced by different variables, like breeze, dampness, and temperature and air contamination on aerospora this prompts different changes as for aerospora species and amounts starting with one season then onto the next. The convergence of airborne air conceived spores has been connected to wind, mugginess, temperature precipitation, elevation, vegetation and different pollutions. A great number and diversity of fungal particles found in air. Air is the way airborne particles can be transported their spores even hundred or even thousands of kilometres. Fungal spores occupied most of the portion of air, their quality and quantity totally depends upon seasons, weather and climatic conditions. The spores of *Cladosporium*, *Curvularia*, *Alternaria*, Smut, Rust, *Helminthosporium*, *Cercospora* and *Nigrospora* were reported most commonly in agricultural fields. In addition, previous studies have found a direct relation of seasonal variation with variability of type and density of aerospores. The number of fungal types varied throughout the year with more or less similar trend in the fungal concentrations. Maximum number of fungal spore was registered in August and minimum in January. The fungal spores present in the atmosphere are responsible to cause various diseases over many important crops, which affect overall crop production of farmers.

**Keywords:**- Fungi, Aerospora, Crop production, diseases, *Alternaria*

**INTRODUCTION:**-Fungal spores are microscopic biological particles that allow fungi to be reproduced, serving a similar purpose to that of seeds in the plant world. Fungi decompose organic waste and are essential for recycling of carbon and minerals in our ecosystem. It has been estimated that fungi recycle millions of tons of organic waste annually. There are thousands of different fungi in the world which are essential for the survival of other organisms.

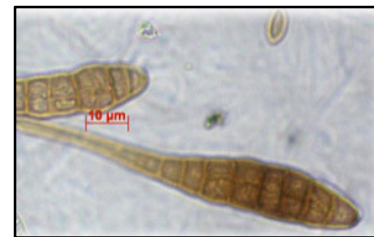
Unfortunately, fungi produce lots of spores that can also be detrimental to both plants and animals including humans. Many fungal spores contain allergens which can trigger a range of respiratory symptoms in those susceptible. These symptoms include sneezing, runny nose, mucous production, cough, congestion, sinusitis, earache, headache, wheezing, asthma and a range of bronchial symptoms and diseases. It is estimated that around 3-4% of the general population get allergy symptoms from fungal spores, including the majority of asthma sufferers. Many fungal spore types have similar allergens which are released at different times of the year. This means that sufferers of fungal spore allergies are likely to be sensitive to many types for large parts of the year. In plants, they infect the leafy shoots and flowers which affect the plants growth, development and reproductive success.

**TYPES OF FUNGAL SPORE** :-Fungi come in a wide range of types and sizes, most are microscopic but some, such as mushrooms and bracket fungi, are quite large. Fungal spores

themselves are all microscopic, some as small as two micrometres in size. Most fungi require warmth and humidity to grow reproduce and release their spores into the environment. Many fungi produce only small amounts of spores which rarely get airborne in quantity. However, some species are very prolific and widespread, producing high concentrations of spores which are readily dispersed into the atmosphere. The main types that trigger most symptoms in allergy sufferers are: *Alternaria*, *Cladosporium*, *Epicoccum*, *Aspergillus*, *Penicillium*, *Didymella*, *Pleospora* and a group of species collectively referred to as Basidiospores. Also important to asthma sufferers are *Sporobolomyces* and *Tilletiopsis*, which are very small spores produced primarily during warm, humid nights.

### 1. ALTERNARIA

**Habitat/Substrates:**-*Alternaria* fungi produce highly allergenic spores across quite a few species, the most potent of which is *Alternaria alternata*. This species causes leaf spot fungus on a wide range of plants, including cereals and grasses. As a result, the spores are abundant during the main season. *Alternaria* can also occur indoors on foodstuffs, carpets, textiles and window frames. Fungal colonies are usually black or grey.

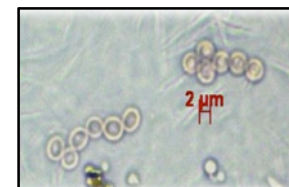


**Season:**-The risk from *Alternaria* is high from mid-July to mid-September. *Alternaria* fungi require a temperature threshold of about 20 °C to start spore production. The first peak of *Alternaria* spores usually occurs after a warm, dry spell followed by rain, then another warm, dry period for spore release. Thereafter, further peaks occur following the same weather patterns. During the harvesting of cereal crops we often see the greatest release of *Alternaria* spores. In 2019, conditions during the summer and again during harvesting were perfect for the production and release of *Alternaria* spores so the concentrations were excessively high.

### 2. ASPERGILLUS/PENICILLIUM

**Habitat/Substrates:**

There are many of *Aspergillus* and *Penicillium*, which live on a wide range of substrates. The spores can be very prevalent during the peak periods, triggering a range of respiratory problems. The spores are particularly prevalent in wooded areas, compost heaps, rotting wood chips and bark mulch. Some species rot down pine needles, so conifer plantations should be avoided during Autumn. *Penicillium chrysogenum* is found widely in nature, occurs on indoor substrates and is the type used to produce the antibiotic penicillin. N.B. Houseplants can be sources of spores, particularly *Aspergillus/Penicillium* types. If you're keen to have houseplants, only have cacti, which require dry conditions, and ensure the soil surface is covered in grit.



**Season:**-*Aspergillus* and *Penicillium* spores are present in the air throughout the year but the main peak periods are late August to October and January to February.

**Allergenicity:**-High for some types, particularly *A. fumigatus* and *P. chrysogenum*. *A. fumigatus* is a major cause of aspergillosis (farmer's lung).

### 3. CLADOSPORIUM

**Habitat / Substrates:** -*Cladosporium* can be found on a wide range of plant substrates and in soil. Indoor substrates include paint and textiles. The mould colonies are generally black or olive-brown to brown.

**Season:**-The main season runs from May to October, with a peak



starting in June and running until mid -September. The spores are released during dry weather and the highest risk occurs on warm, sunny days.

**ALLERGENIC FUNGAL SPORE CALENDARS** :-These show the monthly average totals of spores per cubic metre of air, for the five year period, 2006 -2010. The concentrations of spores produced by fungi vary greatly. For example, the *Alternaria* peak monthly average spore concentration is 3400, while for *Cladosporium* it is 210,000 and for *Didymella* 35,000. As a result, the thresholds for symptoms will also vary. However, thresholds have only been ascertained for *Alternaria* and *Cladosporium* so far. The calendars have been produced by averaging 5 years of data collected in Worcester. Worcester is located in the centre West of the country and receives high amounts of pollen and spores due to very suitable weather and sources. Although the trends shown will be similar for much of the country, the average amounts will tend to be lower in western coastal regions and mountainous areas. The spore seasons in Northern Ireland, Scotland and the far North England will also start a few days to two weeks later than in the more southerly regions.

**Spore levels show trends throughout the year:**

**Spring**:-In the spring, most spore types are at low levels, apart from *Pleospora*. *Cladosporium* and *Tilletiopsis* can start increasing in May if the weather is warm and dry.

**Summer to early Autumn** :-The spore risk starts to rise in mid -June with the increase in temperatures. The risk peaks in late June/early July and continues until late September.

Typically, during the day, there will be the 'dry -weather' spore types of *Alternaria* & *Cladosporium* and some types of *Penicillium* and *Aspergillus*. 'Wet -weather' spores respond to the dew during the night, such as *Didymella*, *Sporobolomyces* and *Tilletiopsis*. Therefore, there are a wide range of types that can affect people during each 24 hour period. In addition, rainfall will help the production of spores which are then released after heavy rain or during light showers or drizzly rain. There is a lower spore risk in very windy, unusually cold and dry weather. When late August and September are warm and humid, *Penicillium* and *Aspergillus* types can become very problematic for those affected by them, triggering a range of symptoms including hay fever, mucous production, cough, wheezing and asthma.

**Mid-Autumn**:-*Penicillium* and *Aspergillus* types can continue to be quite high into October - and even November and early December if temperatures remain mild. There are usually some of these spores present in the air throughout the autumn and even lower levels can trigger some symptoms. Many other spore types are starting to decline, but the risk can be moderate to high on warmer, humid days. By the end of November, the risk decreases to low unless it is very mild and damp. The lowest risk is on dry, cold frosty days. Spores from mushrooms and bracket fungi reach their peak at this time of year, particularly in rural areas, although the risk is low to moderate for most spore sufferers as these are milder allergens.

**Winter**:-*Aspergillus* and *Penicillium* types quite often have a second peak in January and early February. Other spore types are low in winter, although *Pleospora* can start increasing from February.

**ROLE OF FUNGI IN AGRICULTURE** :-Fungi are a group of eukaryotic organisms and source of food, organic acids, alcohol, antibiotics, growth -promoting substances, enzymes, and amino acids. They include microorganisms like molds, yeasts, and mushrooms. They live on dead or living plants or animals' tissue. Fungi are very different from other living organisms; they are the primary decomposers of substances in the ecological system. Fungi are tremendous decomposer of organic waste material and most readily attack cellulose, lignins, gums, and other



organic complex substances. Fungi can act also under a wide range of soil reaction from acidic to alkaline soil reactions. Fungi conjointly play a basic role in different physiological processes as well as mineral and water uptake, chemical change, stomatal movement, and biosynthesis of compounds termed biostimulants, auxins, lignan, and ethylene to enhance the flexibility of plants to ascertain and cope environmental stresses like drought, salinity, heat, cold, and significant metals. The microorganism was used from the very beginning of the civilization in the agriculture and industrial processes even before their existence was well known. Production of fermented beverages, bread and vinegar are traditional processors practiced from the time of early civilization. Recent advancement in our understanding about the genetics, physiology, and biochemistry of fungi, has led the exploitation of fungi for preparation of different agriculture and industrial products of economic importance. All the environmental factors influence the distribution of the fungal flora of soil. The primary functions of filamentous fungi in the soil are to degrade organic matter and help in soil aggregation. Besides this property, bound species of *Alternaria*, *Aspergillus*, *Cladosporium*, *Dematium*, *Gliocladium*, *Humicola* and *Metarhizium* manufacture substance like organic compounds in soil and therefore could also be necessary for the maintenance of soil organic matter. Plant growth regulators and chemical fertilizers have been used to increase crop production. Application of chemical fertilizers to crop plants negatively affects human health and environments. Recent studies have focused on identification of alternative methods to enhance plant productivity and protect the soil. Soil borne microbes can enter roots and establish their population in plants as endophytes, and many plant-associated fungi are well known for their capacity to promote plant growth; however, the relationship between these microbes and plants is still uncertain. Microorganisms have the ability to produce phytohormones, solubilize insoluble phosphate and convert complex organic substances to simple forms. Endophytic fungi have also been shown to impart plants with tolerance to salt, drought, heat and diseases. The four endophytic fungi (GM-1, GM-2, GM-3, and GM-4) were tested for their ability to improve soybean plant growth under salinity stress conditions. The seed germination and plant growth were higher in seeds pretreated with endophytic fungal cultures than their controls. The positive influence of fungi on plant growth was supported by gibberellins analysis of culture filtrate (CF), which showed wide diversity and various concentrations of Gibberellic acids. Application of rhizospheric fungi is an effective and environmentally friendly method of improving plant growth and controlling many plant diseases. Three predominant fungi (PNF1, PNF2, and PNF3) isolated from the rhizospheric soil of peanut plants were screened for their growth-promoting efficiency on sesame seedlings. Among these isolates, PNF2 significantly increased the shoot length and fresh weight of seedlings compared with controls. Analysis of the fungal culture filtrate showed a higher concentration of indole acetic acid in PNF2 than in the other isolates. The fungal associations with plants influence the primary and secondary metabolism of plants at all developmental stages. Photosynthesis is an important primary mechanism, and the main source of energy for plants. Its efficiency is related to photosynthetic pigments such as chlorophylls and carotenoids. Leaf chlorophyll a was increased in fungi-treated plants more so than in the controls.

**FUNGAL DISEASES IN VEGETABLE CROPS:-**Fungi constitute the largest number of plant pathogens and are responsible for a range of serious plant diseases. Most vegetable diseases are caused by fungi. They damage plants by killing cells and/or causing plant stress. Sources of fungal infections are infected seed, soil, crop debris, nearby crops and weeds. Fungi are spread by wind and water splash, and through the movement of contaminated soil, animals, workers, machinery, tools, seedlings and other plant material. They enter plants through natural openings

such as stomata and through wounds caused by pruning, harvesting, hail, insects, other diseases, and mechanical damage. Some of the fungi are responsible for foliar diseases – Downy mildews; Powdery mildews; and White blister are some of the highly prevalent foliar diseases. Other fungi – Clubroot; *Pythium* species; *Fusarium* species; *Rhizoctonia* species; *Sclerotinia* and *Sclerotium* species – are soilborne diseases. Some fungal diseases occur on a wide range of vegetables. These diseases include Anthracnose; Botrytis rots; Downy mildews; Fusarium rots; Powdery mildews; Rusts; Rhizoctonia rots; Sclerotinia rots; Sclerotium rots. Others are specific to a particular crop group, e.g. Clubroot (*Plasmiodiophorabraceae*) in brassicas, Leaf blight (*Alternariadauci*) in carrots, and Red root complex in beans. Some examples of common fungal diseases of vegetable crops are provided in the table below with some typical symptoms.

Fungal disease	Factors conducive to spread	Crops affected	Symptoms
White blister/White rust ( <i>Albugo candida</i> )	Optimum conditions for disease development are 3-4 hours in mild temperatures (6-24°C).	Brassicas (including Asian leafy brassicas).	White blisters and swellings on leaves and heads of affected plants; blisters consist of masses of white dust-like spores; up to 100% losses have been reported.
Downy mildews (individual species damage particular crop families)	High humidity, leaf wetness and cool to mild temperatures (10-16 °C).	Wide host range including onions; peas; lettuce; celery; spinach; kale; herbs; cucurbits; brassicas; Asian leafy brassicas.	Symptoms usually begin with yellowish leaf spots which then turn brown; downy growth appears on underside of leaves.
Powdery mildews (some species are restricted to particular crops or crop families)	Moderate temperatures (20-25 °C); relatively dry conditions (unlike downy mildews).	Wide host range and very common, especially in greenhouse crops: cucumber; melons; pumpkin; zucchini; parsnip; beetroot; potato; herbs; peas; bitter melon; tomato; capsicum; Brussels sprouts; cabbage; swedes.	Small, white, powdery patches on most above ground surfaces; usually observed first on undersides of leaves but eventually cover both surfaces; affected leaves become yellow, then brown and papery and die.
Clubroot ( <i>Plasmiodiophorabraceae</i> )	Warm weather; acidic soil (pH less than 7); high soil moisture.	Brassicas (including Asian leafy brassicas).	Plants are yellow and stunted and may wilt in hotter parts of the day; large malformed 'clubbed' roots which prevent the uptake of water and nutrients, reducing the potential yield of the crop.
<i>Pythium</i> species	Cold, wet soil conditions; known as water moulds, they enter untreated water supplies; water supplies for irrigation and hydroponics should be tested regularly.	Many vegetable crops including cucurbits; brassicas; lettuce.	May kill seedlings, which die before they emerge or soon after emergence; plant collapse.
Sclerotinia rots ( <i>S. sclerotiorum</i> and <i>S. minor</i> ) – a range of common names are used	Windy, cool, humid weather; wet soil; survival structures known as sclerotia remain viable in soil for long periods (10-15 years).	Most vegetable crops.	Water-soaked rotting of stems, leaves, and sometimes fruit; followed by a fluffy, white and cottony fungal growth which contain hard black pebble-like sclerotia.
Sclerotium rots ( <i>Sclerotium rolfsii</i> and <i>S. cepivorum</i> )	<i>S. rolfsii</i> – Warm, moist conditions. <i>S. cepivorum</i> – Development is favoured by cool soil conditions (14-19°C) and low moisture.	<i>S. rolfsii</i> – Wide host range including: beans; beets; carrot; potato; tomato; capsicum; cucurbits. <i>S. cepivorum</i> – only affects onions, garlic and related Alliums (shallots; spring onions; leeks).	<i>S. rolfsii</i> – Lower stem and root rots; coarse threads of white fungal growth surround the diseased areas; small brown fungal resting bodies. <i>S. cepivorum</i> – Yellowing and wilting; fluffy fungal growth containing black sclerotia



			forms at the bases of bulbs.
Fusarium wilts and rots (Various <i>Fusarium</i> species including <i>F. solani</i> and <i>F. oxysporum</i> )	Warm to hot weather.	Wide host range including: brassicas; carrots; cucurbits; onions; spring onions; potato; tomato; herbs; peas; beans.	Causes severe root and crown rots or wilt diseases by attacking roots and basal stems; cucurbit fruit and potato tubers can be affected in storage.
Botrytis rots – for example Grey mould ( <i>Botrytis cinerea</i> )	Cool, wet weather.	Celery; lettuce; beans; brassicas; cucumber; capsicum; tomato.	Softening of plant tissues in the presence of grey fungal growth.
Anthraco nose ( <i>Colletotrichum</i> spp. except for in lettuce – <i>Microdochium panattonianum</i> )	Cool, wet conditions.	Wide range of crops including: lettuce; celery; beans; cucurbits; tomato, capsicum; potato; globe artichoke.	Typical symptoms begin with sunken and water soaked spots appearing on leaves, stems and/or fruit.
<i>Rhizoctonia</i> rots ( <i>Rhizoctonia solani</i> ) – range of common names, e.g. Bottom rot (lettuce) and Wire stem (Brassicas)	Warm, humid weather; can survive for long periods in the soil in the absence of a host plant.	Wide host range including: lettuce; potato; brassicas; beans; peas; beets; carrots; capsicum; tomato; cucurbits.	Range of symptoms depending on the crop being grown but can affect roots, leaves, stems, tubers and fruit; plants wilt and may collapse and die.
Damping-off ( <i>Pythium</i> , <i>Rhizoctonia</i> , <i>Phytophthora</i> , <i>Fusarium</i> or <i>Aphanomyces</i> )	Occurs under cold, wet soil conditions; shore flies and fungus gnats can spread <i>Pythium</i> and <i>Fusarium</i> .	Many vegetable crops including: leafy vegetables; brassicas; carrots; beetroot; cucurbits, eggplant; tomato; coriander; spring onions; beans	Young seedlings have necrotic stems or roots; seedlings die or show a reduction in growth.
Cavity spot ( <i>Pythium sulcatum</i> )	Growing carrots after carrots; acidic soil; not harvesting carrots as soon as they reach marketable size.	Carrots.	Cavity spots are small elliptical lesions often surrounded by a yellow halo.
Tuber diseases (Various species)		Potato and sweetpotato.	Potato tubers may be infected with superficial skin diseases, such as common scabs, powdery scab, and <i>Rhizoctonia</i> . Sweetpotatoes may be infected by scurf.
Rusts (several species, e.g. <i>Puccinia sorghi</i> – sweet corn; <i>Uromyces appendiculatus</i> – beans; <i>Puccinia allii</i> – spring onions).	Wind can spread spores great distances; favored by low rainfall, 100% relative humidity and cool to mild temperatures.	Sweet corn; beans; onions; spring onions; beets; celery; silverbeet; endive.	Small, red or reddish-brown pustules that form on the underside of the leaves and sometimes on the pods as well; dusty reddish-brown spores released from pustules (may be black in cold weather).
Black root rot (Different species on different vegetable crops)	Cool soil temperatures; high soil moisture.	Lettuce; beans; cucurbits.	Blackening of roots; stunted plants; plants may die.

**Management:** Integrated Crop Protection (ICP) or the Integrated Pest Management (IPM) approach has achieved success in the management of the fungal diseases. ICP considers the production system as a whole, including all pests and the importance of soil health. It requires a good understanding of the fungi; the periods during which the crops are susceptible; and the influence of environmental conditions.

**Tips for managing fungal diseases include:**

- Understand the lifecycles, survival mechanisms, and conducive environmental conditions for fungi

- Be committed to farm sanitation – clean up your farm and remove all weeds, crop debris, and volunteer hosts
- Use resistant or tolerant varieties
- Use clean transplants and seed (and seed treatments)
- Monitor weather conditions (particularly temperature, humidity, and leaf wetness)
- Have knowledge of relevant disease prediction models
- Understand the implications for irrigation timing and minimise free moisture and high humidity periods (e.g. irrigating at around 4 am rather than at dusk, not irrigating during peak periods of spore release)
- Appropriate crop rotations (long rotations with non-host crops may be necessary)
- Avoid heavily infested blocks by testing soil for soilborne diseases prior to planting
- Monitor crops regularly and be able to detect early symptoms on your crop
- Amend and manage soil to disadvantage the fungi (some fungal diseases can survive in the soil for 30 years or more)
- Minimise ways in which the disease can spread on -farm – remove and destroy sick plants when symptoms first show
- Understand the influence of planting time, plant spacing and overlapping crops
- Apply preventative fungicides based on weather conditions
- Understand fungicide resistance and rotation of chemical groups.

**Conclusions-**The increased absorption of available nutrients from soil as the fungus changes root morphology, which result in the larger root surface available for nutrient absorption. Fungal filaments also act as the absorption surface and increasing the nutrient availability by solubilizing insoluble nutrients like phosphorus, which thus become available to plant and increasing the nutrient mobility due to faster intracellular nutrient mobility and mobilizing nutrients from the soil mass not visited by the roots system but traversed by the mycorrhizal hyphae. The arbuscular mycorrhizal fungi protected plants by up-regulating the activity of antioxidant enzymes and osmolytes and by regulating the synthesis of phytohormones, which might possibly interconnect the various tolerance mechanisms for cumulative stress response. The prominent effect of arbuscular mycorrhizal fungi against salinity was proven to be due to a restriction in sodium uptake by roots and to the homeostasis of nutrient uptake. Many questions concerning fungal infection of plants remain unanswered. However, research in this field obtains its significance from the fact that these microorganisms are major pathogens of many crop species. An understanding of fungal pathogenicity will not only afford insights into the evolution of fungi but also into the highly dynamic process of their coevolution with plants. In addition, the various factors fungi developed to manipulate the physiology of their hosts to optimize the parasitic lifestyle represent valuable tools to study the affected plant processes. This is clearly demonstrated by the impact of fusicoccin and other phytotoxins on unraveling the roles of the plasma membrane H<sup>+</sup>-ATPase in plant cells.

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## A study to assess knowledge attitude and practice regarding COVID-19 among Nursing students of selected Nursing colleges of Latur Maharashtra

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### Abstract:

**Background:-**Covid-19 become global emergency and spread to all countries in the world so quickly. Healthcare care system played an integral part in this pandemic. Lack of facilities and manpower was the main concern. Some countries allow student and retired health care persons to work with covid-19 patient. Knowledge is the key while working with patient who is suffering with this deadly disease. Here I took a small step to identify the knowledge of student nurses and their attitude and level of practice towards Covid-19.

**Objectives:-**To assess knowledge, attitude and practice of nursing students towards Covid-19.

**Method:-**This was a descriptive cross-sectional study conducted during the COVID-19 pandemic period, between 10 July 2021 –30 July 2021. The study was conducted in five nursing schools and Colleges in Latur. The participants were nursing students who met the inclusion criteria of this study. Data were collected using an online questionnaire created in Google forms. The link of the questionnaire was sent to participants through WhatsApp groups and other social media. To reach as many respondents as possible, a snowball sampling technique was used.

**Conclusion:-**The results of this study showed that most of the nursing students participated in this study had a good and average level of knowledge, very positive attitudes and a Good level of practices towards COVID-19. Seminars, conferences, Sensitization, education campaigns are needed to improve their preventative practices, such as hand hygiene and wearing face mask handling patients with COVID-19. Ensuring adequate infection prevention and control training for all nursing student and universal access to appropriate PPE were identified as key areas that needed to be addressed. In addition, it may be of importance to include expertise, skills regarding covid-19 into nursing curriculum to improve knowledge, attitudes and practices of future nursing professionals and to prepare them for emergencies and outbreaks.

**Keywords:-**Assess, knowledge, attitude, practice, Covid-19, nursing students, nursing college

**INTRODUCTION:-**The coronavirus disease 2019 (COVID19) has quickly become a global threat to human health.<sup>1</sup> Coronavirus disease 19 (COVID-19) is a communicable disease caused by a novel coronavirus designated SARSCoV-2 (severe acute respiratory syndrome coronavirus 2) This animal coronavirus spill over to humans is the third one to be documented in the past twenty years<sup>2</sup>. Evidence indicates that SARS-CoV-2 has a zoonotic source.<sup>3</sup> a novel coronavirus (2019-nCoV) associated with human to human transmission and severe human infection has been reported since late December 2019 from Wuhan city, Hubei province in China.<sup>4,5</sup> People infected with COVID-19 may experience a wide range of symptoms, from mild to severe illness. These symptoms include cough, shortness of breath, fever, muscle pain, chills, sore throat, and loss of the sense of taste or smell. However, these symptoms are not universal, as other studies have reported patients with gastrointestinal symptoms such as nausea, vomiting, or diarrhea.<sup>6</sup> According to the WHO, approximately 80% of COVID-19 patients in China experienced mild symptoms and recovered without any medical intervention, while 14% of them had experienced severe illness, and 5% were critically ill. However, the risk of having severe illness is higher in the elderly and individuals with underlying chronic diseases such as cancer,

diabetes, and lung diseases.<sup>7</sup> On 11 March 2020, the World Health Organization (WHO) declared coronavirus disease 2019 (COVID -19) a global pandemic as a result of its immense spread worldwide [1,2]. The first cases of COVID -19 were reported as beginning in mid -November 2019 in Wuhan, China.<sup>8,9</sup> At the beginning of the outbreak, very few countries including Italy, Spain and Ecuador experienced the most abrupt COVID -19 surge in the number of new cases, exerting unprecedented pressure on their health systems. The Ministry of Health and Family Welfare in India reported 26,496 as total confirmed cases (including 111 foreign nationals), 5804 discharged/cured/migrated cases, and 824 deaths with COVID -19 infection till April 26, 2020, 08:00 GMT + 5:30 (<https://www.mohfw.gov.in>). Globally, the countries need to use robust system for surveillance and audit of COVID -19 testing to detect suspected cases by specified case definition and detailed investigation protocol as recommended by the WHO.<sup>11</sup> In India, certain states namely Maharashtra, Gujarat, and National Capital, Delhi has been severely affected by the attack of the COVID -19 outbreak. The Indian government has taken some unprecedented measures to break the chain of transmission of the COVID -19 in the country including complete lockdown in the country, initially for 21 days, which was extended to another 19 days till May 3, 2020. The lockdown constituted suspension of schools/colleges, public transportation, public places, i.e., restaurant, hotel, bar, religious gathering, and close surveillance of high -density community areas using drone cameras, and mandatory 14 -day quarantine for an individual who comes in contact with COVID -19-confirmed case. However, problem to break the chain of transmission of COVID -19 and mortality becomes more complex in reaction to lack of prophylactic vaccine, scientific treatment line, and lack of sound knowledge and experience among health personnel to manage such infectious diseases in the past. Nursing students who practice in healthcare -related areas have to transition from attending only educational sessions to demonstrating appropriate clinical responsibilities. Hospital settings carry the risk of cross -transmission of COVID -19, and hence, compliance with hand hygiene and subsequent control prevention is required. Hand hygiene has been identified as a measure to prevent the transmission of microorganisms; it is recognized as a potential factor in reducing healthcare-related infections. WHO reported that hand hygiene is a major preventative strategy— an essential method for preventing infection transmission between healthcare workers and patients.<sup>13,14</sup> Few studies, however, focus on interns' knowledge of COVID -19 and their attitude toward hand hygiene in Saudi Arabian universities. Previous studies have reported that healthcare workers tend to have good knowledge of and a positive attitude toward COVID-19;<sup>15,16,17</sup> However, a study by Nair et al.<sup>8</sup> showed that only 9% of Indian nursing and medical students had good knowledge of hand hygiene, and most of the study participants had a suboptimal attitude, which influences the prevalence of infectious diseases. During the current COVID-19 pandemic crisis, hospitals need more assistance than ever to manage the influx of COVID-19 patients, and bringing additional skilled nurses into the workforce may support and enhance health system response to this disease. Many countries allowed nursing students and retired nurses to join the front lines in the fight against COVID -19. If the situation required it, Moroccan nursing students may be asked to participate in health care services and do their parts during this COVID-19 pandemic.

**AIM:-** To assess knowledge, attitudes and practices of nursing students towards COVID-19.

**OBJECTIVES:**

1. To assess the knowledge, attitude, and practices of nursing students towards COVID-19.
2. To determine the relationship between nursing students

A Knowledge and attitude

B.Knowledge and practices

C.Practices and attitude;

Towards COVID-19.

1.To determine the association of level of knowledge of nursing students towards COVID - 19 with their selected personal variables age, gender, educational qualification, training, exposure to COVID-19 patient, religion, residence and family income.

### **HYPOTHESIS**

**H<sub>1</sub>**-There will be significant relationship between

a) Knowledge and Attitude

b) Knowledge and Practice

c) Attitude and Practice;Of nursing students towards COVID-19.

**H<sub>2</sub>**- There will be significant association between nursing students' levels of knowledge towards COVID-19 and their selected personal variables.

**Design**:-This was a descriptive cross-sectional study conducted during the COVID -19 pandemic period, between 10 July 2021–30 July 2021.

**Participants**: - The study was conducted in five nursing schools and Colleges in latur. The participants were nursing students who met the inclusion criteria of this study. The inclusion criteria consist of students regularly matriculated into these schools and Colleges at the time of the survey, regardless of their year of study.

**Data collection**: - Data were collected using an online questionnaire created in Google forms. The link of the questionnaire was sent to participants through WhatsApp groups and other social media. To reach as many respondents as possible, a snowball sampling technique was used. The development of the questionnaire was based on a review of literature and questionnaires used in other similar studies.

**Data analysis**: Data analysis was performed using SPSS software, version 16.0. The results were presented as frequencies and percentages.

**Ethical considerations**: The study protocol was approved by the Research Ethics Committee. Participation in this study was voluntary and was not compensated. Electronic informed consent was obtained from all participants.

### **RESULTS**

**ORGANIZATION OF FINDINGS** :-The data were collected and entered in the master sheet and the findings are presented under the following headings.

**Section 1: Description of sample characteristics** :-Frequency and percentage distribution of nursing students according to their sample characteristics.

#### **Section 2:**

**a) Description of nursing student's knowledge, attitude and practice scores related to Covid-19.**

**b) Findings related to relationship between nursing students:**

1] Knowledge and Attitude

2] Knowledge and Practice

3] Attitude and Practice; **towards Covid-19.**

#### **Section 3:**

n = 525

SAMPLE CHARACTERISTICS	FREQUENCY/ PERCENTAGE
<b>AGE (YEARS)</b>	
1. 18 to 22 years	372 (70.85%)
2. 23 to 26 years	123 (23.42 %)



3. 27 to 30 years	30	(5.72 %)
4. 30 and above	----	
<b>GENDER</b>		
1. MALE	197	(37.52 %)
2. FEMALE	328	(62.48 %)
<b>PROFESSIONAL EDUCATION</b>		
1. DIPLOMA IN NURSING (G.N.M)	205	(39.04 %)
2. BASIC B.Sc. NURSING	290	(55.25 %)
3. P.B. BSc. NURSING	30	(5.71 %)
<b>Special Training for COVID-19</b>		
1. YES	148	(28.19 %)
2. NO	377	(71.80 %)
<b>Exposure to COVID-19 patient</b>		
1. YES	161	(30.66 %)
2. NO	364	(69.33 %)
<b>Religion</b>		
1. Hindu	458	(87.23 %)
2. Muslim	45	(08.57 %)
3. Christian	18	(3.42 %)
4. Other	04	(0.76%)
<b>Residence</b>		
Urban	336	(64 %)
Rural	162	(30.85 %)
Semi-urban	27	(05.14 %)
<b>Family income</b>		
1. Rs.5000 to Rs.10000	35	(06.66 %)
2. Rs.10001 to Rs.15000	233	(44.38%)
3. Rs.15001 to Rs.20000	22	(04.19 %)
4. Rs.20001 and above	35	(06.66 %)

Findings related to association of level of knowledge of nursing students towards COVID -19 with their selected personal variables age, gender, educational qualification, training and exposure to COVID-19 patient, religion, residence and family income.

## SECTION 1

### DESCRIPTION OF SAMPLE CHARACTERISTICS

Frequency and percentage distribution of nursing student according to their sample characteristics

The study sample composed of 525 nursing student. The sample characteristics are described under sub headings age, gender, educational qualification, training, and exposure to COVID -19 patient, religion, residence and family income.

#### Table: 1

#### Frequency and Percentage distribution of subjects according to their selected personal variables

The data presented in Table 1 shows the distribution of nursing students according to their age, gender, educational qualification, training, and exposure to COVID -19 patient, religion, residence and family income.

**Age:** The age of the sample varied from a minimum of 18 to a maximum of 30 years. It was found that highest percentage 372 (70.85%) of them were in the age group of 18 – 22 years, 123 (23.42%) were in the age group of 23 - 26years and rest 30 (5.72%) were age group of 27 to 30

years.

**Gender:** Percentage distribution of nursing students according to their gender reveals that majority of them 328 (62.48%) were females whereas 197 (37.52%) were males.

**Professional education:** The data reveal that majority of students were 290 (55.25 %) pursuing basic BSc nursing, 205 (39.04 %) were doing General nursing midwifery and only 30 (5.71 %) participants were from P B BSc nursing.

**Special Training for Covid -19:** Data reveal that 377 (71.80 %) nursing student didn't receive any kind of special training for COVID -19 and 148 (28.19 %) nursing students were gone through COVID-19 training.

**Exposure to Covid -19 patient:** Among 525 nursing students highest 364 (69.33 %) does not had any exposure to COVID -19 patient and 161 (30.66 %) nursing students were having exposure to COVID-19 patient.

**Religion:** The data presented in Table -1 shows that, 458 (87.23 %) of nursing student were Hindu, 45 (8.57 %) nursing students were Muslims, 18 (3.42 %) were Christian and 04 (0.76%) were following other religion.

**Residence:** Data reveal that majority of 336 (64%) participant lives in urban area, whereas 162 (30.85%) in rural area and 27 (05.14%) belongs to semi-urban area.

**Family income:** The data reveal that 233 (44.38%) nursing student's family income were between Rs.10001 to 15000, 22 (04.19 %) were between 15001 to 20000 and 35(06.66%) between Rs.5000 to 10000 and 20001 and above.

## Section 2:

### a) Description of nursing student's knowledge, attitude and practice scores related to Covid-19.

**Table: 2**

**Mean, median, standard deviation, and range of knowledge, attitude, and practice scores of nursing student on COVID-19**

**n = 525**

Variables	Mean	Median	SD	Range
Knowledge score	14.13	14.0	±2.95	05 – 20
Attitude score	21.19	21.0	±2.95	10 – 27
Practice score	7.14	8.0	±1.68	04 – 09

The data presented in Table 2 shows that the knowledge scores of nursing students varied from 05 – 20 whereas attitude scores varied between 10 – 27 and practice scores ranged between 04 – 09 as against 0 – 20, 9 – 27, and 0 – 09 respectively. The mean knowledge score, attitude score, and practice score are 14.13, 21.19 and 7.14 with standard deviation of ±2.95, ±2.95 and ±1.68 respectively. The median score for knowledge, attitude, and practice are 14.0, 21.0 and 8 respectively.

**Table: 3**

**Frequency (f) and Percentage (%) distribution of nursing student according to their level of knowledge, attitude and practices on COVID-19**

**n= 525**

Variables	Level of knowledge			Level of Attitude		Level of Practice	
	Poor (0 -10)	Average (11 -15)	Good (16 -20)	Negative (09 -18)	positive (19-27)	Poor (0 -04)	Good (05 -09)
Staff Nurses Frequency / Percentage	77	279	169	78	447	37	488

Data in the Table 3 shows that, the 169 (32.19%) of the nursing student were having good knowledge level (16 – 20), 279 (53.14%) of nursing student have average knowledge level (11 – 15), and 77 (14.66%) nursing students had poor knowledge level towards COVID -19. Majority 447 (85.14%) of the nursing students have positive attitude (19 – 27), 78 (14.85%) of nursing students showed negative attitude (9 –18) towards COVID -19. 488 (92.95%) of the nursing students had good practice levels (05 – 09), only 37 (07.04%) of nursing students had poor practice levels (0 – 04) towards COVID-19.

**b) Finding related to relationship between:**

i] Knowledge and attitude

ii] Knowledge and practice

iii] Attitude and practice;

Towards COVID-19

To find the relationship between the knowledge, practice and attitude scores of nursing student related to COVID -19 the Pearson's correlation coefficient was computed .The findings are presented in Table-4

To test the statistical significance, the following null hypothesis was stated:

H<sub>01</sub>-There will be no significant relationship between nursing students

1] Knowledge and Attitude

2] Knowledge and Practice

3] Attitude and Practice; towards COVID-19.

Variables	Level of Knowledge		$\chi^2$	d(f)	Level of significance
	Poor and average	Good			
<b>Age (years)</b>			3.502 <sup>a</sup>	4	NS
18 - 22	258	114			
23 - 26	81	42			
27- 30	17	13			
<b>Gender</b>			.462 <sup>a</sup>	2	NS
Male	137	60			
Female	219	109			
<b>Education</b>			7.741 <sup>a</sup>	4	NS
GNM	132	73			
BSC	208	82			
PBBsc	16	14			
<b>Special Training for COVID-19</b>			1.073 <sup>a</sup>	2	NS
Yes	96	52			
No	260	117			
<b>Exposure to COVID-19 patient</b>			3.954 <sup>a</sup>	2	NS
1. YES	113	48			
2. NO	243	121			
<b>Religion</b>			4.229 <sup>a</sup>	6	NS
Hindu	310	148			
Muslim	29	16			
Christian	14	04			
other	03	01			
<b>Residence</b>			3.246 <sup>a</sup>	4	NS
Urban	223	113			
Rural	113	49			
Semi-urban	20	7			
<b>Family income</b>					
Rs.5000 to Rs.10000	28	07			

Rs.10001 to Rs.15000	163	70	12.476 <sup>a</sup>	8	NS
Rs.15001 to Rs.20000	144	78			
Rs.20001 and above	21	14			

**Table 4**

**Correlation coefficient computed between: knowledge and attitude scores, knowledge and practice scores, and attitude and practice scores of nursing student towards COVID-19.**

**n = 525**

VARIABLES	MEAN	COEFFICIENT OF CORRELATION		
		KNOWLEDGE	ATTITUDE	PRACTICE
Knowledge	14.1352	----	.036	.030
Attitude	21.1924	.036	----	-.121
Practice	7.1467	.030	-.121	----

$\chi^2(525) = 0.1967$      $P = 0.05$     \* = Significant

Table 4 shows that nursing student' knowledge and attitude, knowledge and practice, and attitude and practice had no positive correlations which are found to be statistically significant. Therefore, these findings support the null hypothesis  $H_0$  and Research hypothesis  $H_1$  is not supported.

### SECTION 3:

**Findings related to association of level of knowledge of nursing students towards COVID - 19 with their selected personal variables age, gender, educational qualification, training and exposure to COVID-19 patient, religion, residence and family income.**

To test the statistical significance, the following null hypothesis was stated:

$H_{02}$ - There will be no significant association between staff nurses' levels of knowledge towards COVID-19 and their selected personal variables.

**Table 5**

**Chi-square between the levels of knowledge of nursing students towards COVID -19 and with their selected personal variables.**

**n = 525**

$\chi^2 df(1) = 3.84P = 0.05$ \*Yate's correction done

Computed chi -square values for association between level of knowledge of nursing student towards their selected legal responsibilities in patient care and their selected personal variables age, gender, educational qualification, training and exposure to covid -19, religion, residence and family income. Were not found to be statistically significant at 0.05 levels. Therefore, the null hypothesis related to knowledge, attitude and practices is supported and research hypothesis is not supported inferring that Knowledge, Attitude and Practices of nursing student' related to COVID-19 of their age, gender, educational qualification, training and exposure to covid -19, religion, residence and family income.

**DISCUSSION:** The purpose of our study was to assess the knowledge, attitudes and practices of nursing students during the COVID -19 pandemic. The main findings of the study showed that most of the participants had an Average knowledge and positive attitudes towards COVID -19, and a Good level of practices towards COVID -19. Among 525 nursing student participants the 169 (32.19%) of the nursing student were having good knowledge level (16 – 20), 279 (53.14%) of nursing student have average knowledge level (11 – 15), and 77 (14.66%) nursing students had poor knowledge level towards COVID -19. Majority 447 (85.14%) of the nursing students have positive attitude (19 – 27), 78 (14.85%) of nursing students showed negative attitude (9 -18)

towards COVID-19. 488 (92.95%) of the nursing students had good practice levels (05 – 09), only 37 (07.04%) of nursing students had poor practice levels (0 – 04) towards COVID-19.

**CONCLUSION:** The results of this study showed that most of the nursing students participated in this study had a good and average level of knowledge, very positive attitudes and a Good level of practices towards COVID-19. Seminars, conferences, Sensitization, education campaigns are needed to improve their preventative practices, such as hand hygiene and wearing face mask handling patients with COVID -19. Ensuring adequate infection prevention and control training for all nursing student and universal access to appropriate PPE were identified as key areas that needed to be addressed. In addition, it may be of importance to include expertise, skills regarding covid-19 into nursing curriculum to improve know ledge, attitudes and practices of future nursing professionals and to prepare them for emergencies and outbreaks.

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## A PV Module Capture Solar Radiation by Back and Front Surface

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**Abstract**—This paper present a detailed performance model for bifacial PV modules it employs configuration factors to compute irradiance the rear surface of each cell in the module and the maximum efficiency depends on the spectral albedo of the surroundings. A bifacial PV cell is able to capture solar radiation by back surface. This ability requires a suitable reflector appropriately oriented and separated from the cells rear surface.

**Keywords** – Bifacial Solar module, Maximum conversion efficiency, Shockley- Queisser

**INTRODUCTION** -The key constituent of a solar module semi conductor is silicon. N -type (free electrons) silicon has had phosphorous added to it while a p -type (electron voids) silicon has had boron added [2]. A conventional solar cell consists of minimal layers: an electrode , glass with an anti-reflective layer, n-type, p-type, crystalline Si, and a metal electrode Fig. 1.

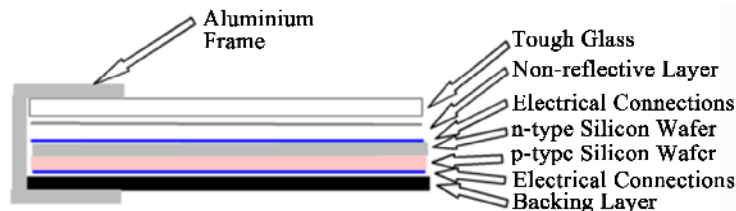


Fig. 1. Conventional solar cell [3].

Sanyo HIT 195 Bifacial Modules combine the use of single crystalline silicon (Si) with extremely thin amorphous silicon layers (a-Si) on both sides of the cell to allow both the front and back side of the photovoltaic module to absorb light and produce energy. Hetero junction with Intrinsic Thin Layer (HIT) modules have high conversion efficiency, excellent temperature characteristics, and a considerable output under diffuse and low light conditions [1].

By contrast, the HIT Double Module has many layers: a top electrode, p -type amorphous Si, intrinsic amorphous Si, crystalline Si (n -type), another layer of intrinsic amorphous Si, intrinsic amorphous Si, n-type amorphous Si, and a bottom electrode. This multi-layering effect allows light absorption from both sides. Compared with conventional solar cells, HIT solar cells (**Fig. 2**) have a better temperature coefficient and a higher- open circuit voltage [4].

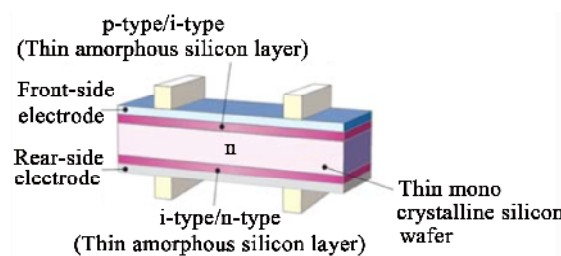
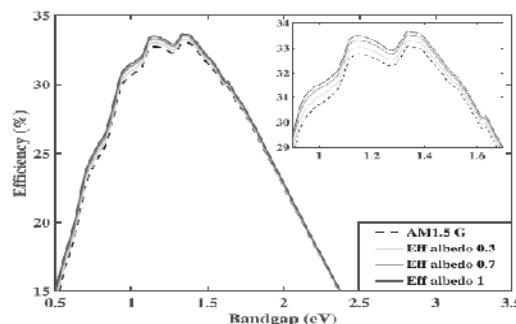


Fig. 2. Sanyo HIT solar cell [1].

Increasing the power output of solar modules is a crucial step toward lowering the cost of electricity generated by photovoltaic power plants [5], [6]. One strategy for increased power



output is the use of bifacial solar cells that are designed to accept incident light at the front and rear of the cells. This concept was already developed in the 1960s [7], but only recently module manufacturers started selling bifacial modules as a standard technology. The gain from using a bifacial configuration often exceeds the power output of monofacial solar modules by a surprising amount, and values of up to 50% have been reported [8]. A more recent study shows that the bifacial power gain ranges between 13% and 35% under sunny condition and 40% and 70% under cloudy conditions, depending on the height of the ground clearance [9]. However, it is difficult to predict the power output Spectral and effective (dashed lines) albedo of several widely used surfaces. Bifacial solar cell as it strongly depends on the albedo of the surroundings as well as on the geometry in which the cells are mounted [10]. The tilt, the height above ground, and length are the geometric factors of the solar module. These geometric factors affecting the bifacial solar cell efficiency have been extensively studied elsewhere [10]–[11], and the influence of the albedo. The albedo is a measure for how well a surface reflects light and it is defined as the ratio between the power of the reflected light and the power of the total incoming light. The albedo depends strongly on the surface properties. Like green grass has an albedo of 0.24 and white sand possesses an albedo of 0.67. Accepting this additional photon flux of light reflected from the ground yields to effective light concentration within the cell. Therefore, both the voltages and currents of the cells increase. However, the albedo of typical reflective surfaces also exhibits a spectral dependence—which is evident from the examples of green grass and white sand—that affects solar cell performance [12], [13]. The model of Shockley and Queisser [14] to this case and calculate here.



**Fig.3. Maximum conversion efficiency of bifacial solar cells for different effective albedos.**

the maximum efficiency for bifacial solar cells surrounded by different materials. The maximum thermodynamic efficiency and power output increase for several realistic environmental conditions and decrease for others. In the case of green grass, the power output increases by 3.1% and for white sand by 5.2% due to a high flux of reflected photons with energy above bandgap. These results are used to study the implications for silicon solar cells. More than 90% of the modules currently produced use silicon as the absorber material [15]. To date, the only bifacial modules available on the market use silicon cells, with different cell technologies [16].

**Maximum conversion efficiency** :-In order to calculate the power conversion efficiency, the Shockley–Queisser radiative flux balance [14], [17] was adapted to account for power gain due to the acceptance of reflected photons. The incoming optical flux consists of the sum of the front side AM1.5G illumination (ASTMG-173-03) and ground reflected rear illumination. At first, the albedo of the ground is assumed to be uniform and spectral independent, i.e., the ground has an effective albedo ( $RA$ ) [18]. Step-function absorption, with no absorption for photons with energy below bandgap, 100% absorption for photons with energy above bandgap, is assumed

here. The number of photons above bandgap ( $m^{-2} \cdot s^{-1}$ ), accounting for an effective albedo, is enhanced by a factor  $1 + RA$  and there by increasing the short-circuit current density. The open-circuit voltage ( $V_{OC}$ ) is given by

$$V_{OC} = \frac{k_B T_{Cell}}{q} \ln \left( \frac{(1 + R_A) \cdot I_S}{I_0} + 1 \right) \quad (1)$$

in which  $I_S$  is the sunlight generated current,  $I_0$  is the dark saturation current, and  $k_B$  is the Boltzmann constant.  $I_0$  is affected by both radiative and nonradiative recombination processes. The radiative part of the dark current consists of an extra factor of two as compared to a monofacial cell as in the bifacial solar cell back reflector is absent, resulting in a minor decrease in  $V_{OC}$ . The modeling is done for a solar cell temperature ( $T_{Cell}$ ) of 300 K since it is close to the standard test conditions at which solar cells are measured [19]. The conversion efficiency of the bifacial cell increases with  $RA$ , due to a logarithmic increase in  $V_{OC}$  (1). Fig. 3 shows the power conversion efficiency of a bifacial solar cell as a function of the bandgap energy for different values of  $RA$ . A single-junction bifacial solar cell is considered. The maximum conversion efficiency can be obtained via

$$\eta_{Max} = \frac{V_{OC} \cdot J_{SC} \cdot FF \cdot (1 + R_A)}{P_{SUN} \cdot (1 + R_A)} \quad (2)$$

in which  $FF$  is the fill factor,  $J_{SC}$  is the short-circuit current density,  $V_{OC}$  is the open-circuit voltage, and  $P_{SUN}$  is the solar constant of approximately 1000 W/m<sup>2</sup> total solar irradiance. The dashed black line denotes the Shockley–Queisser limit for AM 1.5G spectrum, with no rear-side illumination and without back reflector.

**Front and Rear Irradiance** :- The irradiance available for the front surface of bifacial PV modules is modeled in the same manner as for monofacial PV. Similar methods of transposing direct and diffuse irradiance onto a tilted surface may be used, and the site albedo can be used to estimate the amount of ground reflected light present on the front surface. Determining the irradiance on the rear side of a PV module requires new models. Rear side irradiance comprises primarily diffuse irradiance by way of reflections from the ground and other nearby surfaces, sky diffuse irradiance, with rare circumstances when direct irradiance illuminates the rear surface [21]. The module's orientation, proximity to nearby surfaces, and transparency [22] affect the area of ground and nearby surfaces and fraction of the sky visible from the module's rear surface. Rear-side irradiance models at different levels of detail are needed to support analyses from module and system design to annual energy production assessments [23]. Rear side irradiance can vary substantially depending on a module's position in the row, and rear irradiance may vary by more than 50 W/m<sup>2</sup> across a module's back surface [21]. A cell-level rear-side irradiance model [21] can estimate their irradiance mismatch across a single module and between modules in an array. An array-scale model [24] computes irradiance along a cross-section of a fixed-tilt array with regular rows; the computational simplicity makes this model suitable for energy production assessments for large systems. A similar approach can be used to model rear-surface irradiance for bifacial modules on horizontal east-west single-axis trackers [25]. Ray-tracing models (e.g., [10]) provide detailed assessment of effects of module design details, such as cell to cell spacing and surface reflections, but with significant computational cost.

Selecting the best method for determining rear irradiance may depend on the use case and requirements for computation time, accuracy, and resolution. The detailed cell-level and the array-scale rear-surface irradiance models use view factors, also termed shape and view factors, configuration factors quantify the fraction of irradiance reflected from one surface that arrives at a receiving surface. View factor models [26], [20] calculate back surface irradiance  $E_2$  (W/m<sup>2</sup>) by

$$E_2 = \alpha \times G_1 \times F_{1 \rightarrow 2} \quad (3)$$

Where  $G_1$  is the total irradiance (W/m<sup>2</sup>) on the reflecting area being considered (e.g., an area of the ground),  $\alpha$  is the reflecting surface's albedo (unitless) and  $F_{1 \rightarrow 2}$  is the view factor (unitless) from the reflecting area to the receiving surface. The total irradiance on the back surface of a cell or module is the sum over all contributing surfaces. A view factor model implicitly assumes that all reflecting surfaces are Lambertian, i.e., irradiance is scattered isotropically. Formally, view factors are calculated by integration (Eq. 4) using terms in the illustration. An emitting surface ( $dA_1$ ) reflects incident irradiance, part of which is incident on the receiving surface: the view factor  $VF_{1 \rightarrow 2}$  quantifies the fraction of irradiance emitted by  $dA_1$  that is received by  $dA_2$ .

$$F_{1 \rightarrow 2} = \frac{1}{A_1} \int_{A_1} \int_{A_2} \frac{\cos \theta_1 \cos \theta_2}{\pi s^2} dA_2 dA_1 \quad (4)$$

### Reflection, Shading, Spectrum and Soiling

**Reflections:**-Reflections from a module's front surface are modeled as is done for monofacial modules (e.g., [12]): an empirically determined expression computes the fraction of the direct irradiance on the module's face is reflected away from the angle of incidence of the direct irradiance. Reflections from the rear surface are not explicitly represented; the effect of any reflections can be accounted for in the empirical relationship between total incident irradiance (front surface + back surface) and the current produced by the module.

**Shading:**-PV racking, junction boxes, or module wiring may shade parts of the rear side of a bifacial PV module from irradiance sources. To discover the effects of rear-surface shading. However, obstructions affected both ISC and IMP in a complicated manner depending on obstruction orientation; this is not surprising as obstructions across several cell strings will have a different effect on current than obstructions confined to a single cell string.

**Spectrum:**-The spectrum of the incident light alters the module's current due to the spectral response of the module's cells. The effect of spectrum changes can be estimated with existing models, e.g., [27], [28]. Spectral irradiance on the rear side differs from spectral irradiance on the front side due to reflections from the ground and/or nearby objects. Here, we neglect the effect of spectrum of rear-surface irradiance, reasoning that its effect is less than the uncertainty in estimating the broadband rear-surface irradiance.

**Soiling:**-The effects of soiling on bifacial PV modules can be represented by two factors applied to front and rear-surface irradiance, respectively. For bifacial modules at fixed tilts, it is observed little to no soil accumulation on the rear surfaces in Albuquerque, NM, USA. It stands to reason that vertical modules will accumulate soil equally on both faces, although no measurements are available to quantify the accumulation of soil on vertical module surfaces.

**Cost of a bifacial module, \$/m<sup>2</sup> :-**Bifacial modules confront different cost difficulties that are thwarting their more noteworthy grasp by item makers. Particular to the assembling procedure,

more financially savvy intends to metallize the phones are required, likely expecting refinements to the material utilized and to the procedure in which the material is kept. Therefore, customization will, to some degree, be required by future bifacial assembling instruments. The level of important customization will affect the cost and relative capacity to use the scale economies given by the current production network. What's more, the bifacial PV area will be required to climate the intense macroeconomic conditions encompassing forceful PV module evaluating and close term oversupply. Low estimating decreases income and prompts low-to-negative working edges for most module makers. It is monetarily hard to reasonably develop fabricating limit of existing items, not to mention a more imaginative idea, for example, bifacial modules. This issue is exacerbated by the more costly assembling tooling and procedures required to item bifacial modules today. The high capital cost and low profits for cell and module generation is a bottleneck for reception by makers.

**Module Power Rating, W/m<sup>2</sup>:**-The power yield of bifacial modules is plant-particular. Power gains in the field have shifted from 5% to 30%. There is no agreement on the most proficient method to gauge, rate, and after that adapt this power support. As of now, the global network is creating IEC 60904-1-2, which would give direction on the most proficient method to gauge the power yield of a bifacial module under standard test conditions. It is left to the producer on what control number to list as name plate.

**Price of a bifacial module** :-Monofacial modules have a solitary value, paying little heed to establishment area, and are regularly thought about on a \$/W premise. This valuing and correlation build is hard to use with bifacial modules since plant particular variables assume an expansive job in power creation. Discovering balance in the rating and estimating problem is important for reasonably remunerating all gatherings along the PV inventory network and cultivating market development.

**Lifetime energy output, kWh:**-Bifacial modules have indicated expanded age on a vitality yield (kWh/kW) premise contrasted with monofacial modules. They may likewise have brought down corruption rates because of lower susceptibility to cell microcracking and water entrance. Existing testbeds and demo ventures are demonstrating out these incentives and helping with specialized bankability. For bigger scale bifacial plants, it stays testing to anticipate and show their vitality generation. The advancement and verification of bifacial displaying programming is non-unimportant, yet basic for more extensive reception of bifacial modules. Eagerness to fund bigger scale bifacial PV plants will require more forthright due diligence than what at present exists. Directed, very much organized, and community oriented exercises among industry specialists have gained incremental ground towards this objective.

**Future Opportunities:**-Other potential pathways to explore bifacial modules include (in order of least to most effort):

- Observe the advancement and pilot testing of improved bifacial cells and modules and also early field exhibits to approve execution.

Collaborate with associations, for example, NREL and Sandia, in the field testing of modules, making of rating measures, and additionally improvement of prescient PC models for the structure of PV plants using bifacial modules.

- Perform more top to bottom evaluation of existing information around bifacial module execution for one next to the other correlation against monofacial modules.
- Develop new field-test extends that emphasis all the more solely on bifacial modules to approve as well as show special performance openings, for example, bifacial modules on single-

hub trackers or potentially bigger field exhibits of different racking and structure setups. These endeavors can conceivably be combined with other research objectives.

**Conclusions** –Hence in this way Expanding the power yield of solar modules is a urgent advance toward bringing down the expense of power created by photovoltaic power plants [5], [6]. One strategy for increased poweroutput is the use of bifacial solar pv module that are designed to acceptincident light at the front and rear of the cells.

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## **A research study on the effect of lockdown on Mental Health of inhabitants of the city of Mumbai**

**Dr. Shreyas. M. Shirahatti**

**Research Scholar**

**Abstract:-**Covid-19 pandemic has caused havoc worldwide. India is additionally prying a challenging situation because the number of infected/positive cases is increasing day by day. With strict preventive measures and restrictions by the Indian Government within the type of nationwide lockdown, the citizens are prying a variety of psychological and emotion reactions, fear and uncertainty being one in all them. This study was conducted with the aim of exploring the impact of Covid-19 and lockdown on the psychological state of people. DASS-21 was used to assess Depression, Anxiety and Stress among 100 respondents in the city of Mumbai. Results suggest that there's a major difference among Anxiety and Stress across gender and age. Also the levels of Anxiety, Stress and Depression were determined to be the highest in females and in the age group of 20 – 30.

**Keywords:-** Mental Health, pandemic, Covid-19, psychological distress, wellbeing, Gender, Age group

**Introduction:-**The word "pandemic" comes from the Greek word "pandemos" wherein "pan" means "all" and "demos" means "people or population" i.e. "all the people". A virus is a virus which crosses international boundaries and affects all (nearly all) of the people. Other term used simultaneously is „epidemic“. A virus ("epi" means "upon") as explained by the WHO, is that the regional outbreak of an illness that spreads unexpectedly. It refers to a rise, often sudden, within the number of cases of a disease beyond what's normally expected within the population of a section. Samples of epidemics in India within the past include the outbreaks of zika virus, chikungunya and infectious disease. The World Health Organisation (2001) defined Pandemic as “an epidemic occurring worldwide, or over a awfully wide area, crossing international boundaries and typically affecting an outsized number of people”. This definition does not include anything about population immunity, virology or disease severity. Pandemics will be said to occur annually in each of the temperate southern and northern hemispheres, only if seasonal epidemics cross international boundaries and affect an outsized number of individuals. However, seasonal epidemics don't seem to be considered pandemics. (WHO, 2001) Coronaviruses are an outsized group of viruses that are known to infect both humans and animals and in humans cause respiratory disorder that range from common colds to rather more serious infections. The previous well-known case of a coronavirus epidemic was Severe Acute Respiratory Syndrome (SARS), which was first detected in southern China in 2002, then spread to 26 countries leading to over 8,000 cases and 774 deaths. The Covid-19 disease was initially thought of as virus infection and first time on 31 December, 2019 World Health Organisation's China office heard the reports of an unknown virus (hence the name novel coronavirus) behind sizable amount of Pneumonia cases, in Wuhan city of Eastern China. Apparently, the disease originated from a sea grocery store of Wuhan where wild animals, birds, marmots, rabbits, bats, snakes etc are illegally traded. It's known that coronaviruses can jump from animals to humans; hence the primary people to become infected with this disease are primarily from the ocean grocery store that got infected from being in-tuned with animals. (WHO, 2020)

**Research Objectives:-**To evaluate magnitude of Depression, Anxiety and Stress amongst inhabitants of Mumbai through DASS – 21 scale.



### Research Hypotheses

H<sub>1</sub>: There is significant difference in the magnitude of Anxiety experienced across gender amongst inhabitants of Mumbai

H<sub>2</sub>: There is significant difference in the magnitude of Stress experienced across gender amongst inhabitants of Mumbai

H<sub>3</sub>: There is significant difference in the magnitude of Depression experienced across gender amongst inhabitants of Mumbai

H<sub>4</sub>: There is significant difference in the magnitude of Anxiety experienced across Age amongst inhabitants of Mumbai

H<sub>5</sub>: There is significant difference in the magnitude of Stress experienced across Age amongst inhabitants of Mumbai

H<sub>6</sub>: There is significant difference in the magnitude of Depression experienced across Age amongst inhabitants of Mumbai

### Research Methodology

The evaluation of Depression, Anxiety and Stress amongst inhabitants of Mumbai was carried out through Depression, Anxiety and Stress Scale (DASS – 21). According to (Lovibond PF, 1995), DASS – 21 is a highly dependable scale with respect to assessment and evaluation of psychological distress in non – clinical as well as clinical population. An online questionnaire on “ Google Forms” was created and was circulated amongst 100 residents of Mumbai, Maharashtra, India in 1<sup>st</sup> and 2<sup>nd</sup> week of May 2020. The results were cross tabulated and the hypotheses were tested through application of non – parametric statistical chi – square test at 5% level of significance.

**Limitations of the Study:-**The study covers only the city of Mumbai and the sample size is restricted to 100. Therefore any generalization of the findings of this study to other cities is not advisable.

**Data Analysis and Interpretation:-**The data analysis has been carried out through cross tabulation and the hypotheses have been tested through application of chi – square test at 5% level of significance.

### Gender \* Anxiety

Crosstab  
Count

		Anxiety					Total
		Low	Average	Moderate	High	Severe	
Gender	Male	10	15	11	9	13	58
	Female	0	5	5	9	23	42
Total		10	20	16	18	36	100

**Table – 01: - Gender – Anxiety Cross Tabulation.**

**Interpretation:-**It is evident from the above data table that more number of females experiences severe anxiety as compared to males.

### Test of Hypotheses through chi – square test at 5% level of significance

H<sub>0</sub>: There is no significant difference in the magnitude of Anxiety experienced across gender amongst inhabitants of Mumbai

H<sub>1</sub>: There is significant difference in the magnitude of Anxiety experienced across gender amongst inhabitants of Mumbai

### Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)

Pearson Chi-Square	17.927 <sup>a</sup>	4	.001
Likelihood Ratio	21.645	4	.000
Linear-by-Linear Association	17.350	1	.000
N of Valid Cases	100		

a. 1 cells (10.0%) have expected count less than 5. The minimum expected count is 4.20.

**Table – 02: - Gender – Anxiety Chi – Square Test.**

It can be seen that the p – value at 5% level of significance is 0.001, which is less than 0.05. Therefore null hypothesis is rejected and it is concluded that there is significant difference in the magnitude of Anxiety experienced across gender amongst inhabitants of Mumbai

**Gender \* Stress**

Crosstab  
Count

		Stress					Total
		Low	Average	Moderate	High	Severe	
Gender	Male	3	9	12	25	9	58
	Female	8	2	3	17	12	42
Total		11	11	15	42	21	100

**Table – 03: - Gender – Stress Cross Tabulation.**

**Interpretation:** - It is evident from the above data table that more number of females experiences severe stress as compared to males. However more number of males experience “High” level of stress as compared to females.

**Test of Hypotheses through chi – square test at 5% level of significance**

H<sub>0</sub>: There is no significant difference in the magnitude of Stress experienced across gender amongst inhabitants of Mumbai

H<sub>2</sub>: There is significant difference in the magnitude of Stress experienced across gender amongst inhabitants of Mumbai

**Chi-Square Tests**

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	11.822 <sup>a</sup>	4	.019
Likelihood Ratio	12.351	4	.015
Linear-by-Linear Association	.065	1	.798
N of Valid Cases	100		

a. 2 cells (20.0%) have expected count less than 5. The minimum expected count is 4.62.

**Table – 04: - Gender – Stress Chi – Square Test.**

It can be seen that the p – value at 5% level of significance is 0.019, which is less than 0.05. Therefore null hypothesis is rejected and it is concluded that there is significant difference in the magnitude of Stress experienced across gender amongst inhabitants of Mumbai

**Gender \* Depression**

Crosstab  
Count

		Depression					Total
		Low	Average	Moderate	High	Severe	
Gender	Male	8	12	26	11	1	58
	Female	4	6	18	8	6	42
Total		12	18	44	19	7	100

**Table – 05: - Gender – Depression Cross Tabulation.**

**Interpretation:-**It is evident from the above data table that more number of females experiences severe depression as compared to males. However more number of males experience “Moderate” and “High” level of depression as compared to females.

**Test of Hypotheses through chi – square test at 5% level of significance**

H<sub>0</sub>: There is no significant difference in the magnitude of Depression experienced across gender amongst inhabitants of Mumbai

H<sub>2</sub>: There is significant difference in the magnitude of Depression experienced across gender amongst inhabitants of Mumbai

**Chi-Square Tests**

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	6.438 <sup>a</sup>	4	.169
Likelihood Ratio	6.728	4	.151
Linear-by-Linear Association	3.465	1	.063
N of Valid Cases	100		

a. 2 cells (20.0%) have expected count less than 5. The minimum expected count is 2.94.

**Table – 06: - Gender – Depression Chi – Square Test.**

It can be seen that the p – value at 5% level of significance is 0.169, which is more than 0.05. Therefore null hypothesis is accepted and it is concluded that there is no significant difference in the magnitude of Depression experienced across gender amongst inhabitants of Mumbai

**Age \* Anxiety**

Crosstab Count

	Anxiety					Total	
	Low	Average	Moderate	High	Severe		
Age Group	20-30	3	7	6	6	18	40
	30-40	1	1	2	1	9	14
	40-50	0	4	4	6	0	14
	50-60	2	4	4	5	7	22
	60 above	4	4	0	0	2	10
Total		10	20	16	18	36	100

**Table – 07: - Age – Anxiety Cross Tabulation.**

**Interpretation: -** It is evident from the above data table that more number of people in the age group of 20 – 30 experience severe anxiety as compared to other age groups.

**Test of Hypotheses through chi – square test at 5% level of significance**

H<sub>0</sub>: There is no significant difference in the magnitude of Anxiety experienced across age amongst inhabitants of Mumbai

H<sub>4</sub>: There is significant difference in the magnitude of Anxiety experienced across age amongst inhabitants of Mumbai

**Chi-Square Tests**

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	35.579 <sup>a</sup>	16	.003
Likelihood Ratio	39.547	16	.001
Linear-by-Linear Association	6.756	1	.009
N of Valid Cases	100		

a. 18 cells (72.0%) have expected count less than 5. The

minimum expected count is 1.00.

**Table – 08: - Age – Anxiety Chi – Square Test.**

It can be seen that the p – value at 5% level of significance is 0.003, which is less than 0.05. Therefore null hypothesis is rejected and it is concluded that there is significant difference in the magnitude of Anxiety experienced across Age amongst inhabitants of Mumbai

**Age \* Stress**

Crosstab  
Count

		Stress					Total
		Low	Average	Moderate	High	Severe	
Age Grou p	20-30	8	2	4	18	8	40
	30-40	0	4	3	5	2	14
	40-50	0	2	3	8	1	14
	50-60	3	0	5	7	7	22
	60 above	0	3	0	4	3	10
Total		11	11	15	42	21	100

**Table – 09: - Age – Stress Cross Tabulation.**

**Interpretation:** - It is evident from the above data table that more number of people in the age group of 20 – 30 experience “high” and “severe” level of stress as compared to other age groups.

**Test of Hypotheses through chi – square test at 5% level of significance**

H<sub>0</sub>: There is no significant difference in the magnitude of Stress experienced across age amongst inhabitants of Mumbai

H<sub>5</sub>: There is significant difference in the magnitude of Stress experienced across age amongst inhabitants of Mumbai

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	26.902 <sup>a</sup>	16	.043
Likelihood Ratio	32.584	16	.008
Linear-by-Linear Association	1.048	1	.306
N of Valid Cases	100		

a. 19 cells (76.0%) have expected count less than 5. The minimum expected count is 1.10.

**Table – 10: - Age – Stress Chi – Square Test.**

It can be seen that the p – value at 5% level of significance is 0.043, which is less than 0.05. Therefore null hypothesis is rejected and it is concluded that there is significant difference in the magnitude of Stress experienced across Age amongst inhabitants of Mumbai

**Age \* Depression**

Crosstab  
Count

		Depression					Total
		Low	Average	Moderate	High	Severe	
Age Grou p	20-30	6	10	16	7	1	40
	30-40	2	0	8	2	2	14
	40-50	0	1	6	5	2	14
	50-60	4	6	7	3	2	22
	60 above	0	1	7	2	0	10
Total		12	18	44	19	7	100

Conclusion:-The research endeavour shows that Covid -19 is definitely giving rise to mental distress amongst the individuals. As there are restrictions due to lockdown, people are compelled to remain indoors.. People are passing through tough times. Youngsters in the age group of 20 – 30 and females are experiencing higher levelsof Anxiety, Stress and Depression.

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## PREPARATION AND EVALUATION OF DENTAL STRIPS CONTAINING SPARFLOXACIN FOR TREATING PERIODONTITIS

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**Abstract:**-Periodontitis is one of the diseases affecting the oral cavity which results in the formation of cavities and it is a major reason for the destruction of the tooth. Prolonged release formulation delivers the drug directly to the periodontal pocket and retains the drug more in the site. Sparfloxacin and polymers like Chitosan used for the preparation. Main objective of the study is to prepare the polymeric strips with chitosan containing sparfloxacin for local protracted drug delivery into periodontal pockets, characterization and optimization of the dental strips. Strips were prepared by solvent casting technique. Periodontal Films belongs to matrix systems in which the drugs are dispersed in polymeric system. FTIR studies indicate that there were no interaction between drug-polymer and other additives. Physico-chemical evaluation of the strips like thickness, hardness and tensile strength were found satisfactory. Drug content value was within the normal range, in *in-vitro* release studies were shows a greater release pattern. The crosslinked strips has a larger release period compared to uncrosslinked strips. All the polymeric strips were observed for any physical change in colour, appearance, flexibility and drug content for 10 weeks. The stability studies showed that there are no changes happened to the drug and the drug content data obtained for a period of six months shows the content did not differ from initial drug content by more than 5%. *In vitro* antibacterial studies were done and it was found that the Sparfloxacin strips inhibit the growth of organisms effectively.

**Key words:**-Sparfloxacin, Chitosan, Dental strips.

**INTRODUCTION:**-Periodontitis are an inflammatory disease in which microbial etiologic factors provoke a sequence of host responses. Chronic periodontitis is a poly-microbial bio-film infection resulting in periodontal attachment loss (Correa et al., 2015). Periodontitis is a reason for tooth loss and affects youngsters and adults. More than a quarter of the population of the entire world experience gingivitis i.e. a smaller version of the periodontal disease. In localized aggressive periodontitis, the disease pattern is due to the attack of neutrophils which gets activated when the bacteria attacks the oral cavity. These neutrophils are overly active and cause vast destruction to the periodontium (Tiyaboonchai et al., 2013). There is a new method called the bioadhesive drug delivery system. In the proximal region the concentration of the medicine will be maintained and thus creates a positive influence over other systems. It is an efficient method to localize these xenobiotic molecules. (Pattnaik et al., 2007)

**Table 1: MATERIALS AND METHODS**

SL NO	CHEMICALS	SOURCE
1.	Sparfloxacin	Yarrow Chem Products, Mumbai
2.	Chitosan	Gift sample from CIFT, Cochin
3.	Glutaraldehyde	Sigma Aldrich
4.	Potassium dihydrogen orthophosphate	Sigma Aldrich
5.	Sodium hydroxide	Merck
6.	Ethanol	Sigma Aldrich
7.	Acetic acid	Merck
8.	Whatman No.1 filter paper	Sigma Aldrich

### PREPARATION AND EVALUATION OF SPARFLOXACIN STRIPS



**Calibration Curve:-**From the standard stock solution a series of dilutions were made using 1% acetic acid to give a concentration of 2, 4, 6, 8, and 10 µg/ml. Absorbance measured against a blank of 1%acetic acid in UV/Visible Spectrophotometer at 297nm for Sparfloxacin, plotted calibration graphs against drug concentrations.

**Preparation of Sparfloxacin Loaded Polymeric Strips:** -For 24 hours Chitosan which was taken in two percent w/v. Then in a solution of acetic acid it was soaked. This process is done. We get a solution which is very clear and then it is vortexed for 15 minutes. Using a muslin cloth this solution is filtered. This procedure is done to wash out the undissolved chitin. To the clear solution of chitosan, the chitosan solution is dissolved; we have to add the drug in required concentration, vortex it for fifteen minutes. Air bubbles were removed by keeping it aside for 30-45 minutes, transferred to the centre of the moulds which are made of glass. This solution is kept at room temperature for about one day thus it gets dried. The Sparfloxacin loaded films was taken for the cross-linking procedure. This step requires the usage of 2 % v/v glutaraldehyde. In these vapors the strip are saturated for 24 hrs and is kept in a glass chamber. From the die after drying the films were removed. These strips were cut in a dimension of 7.5mm in length and 2.5mm in width. Until further use these strips were stored in a dry place i.e a desiccator wrapped in aluminum foil separately.

**Table 2: Composition- Different dental strips.**

Sl.No	STRIP CODE	% OF DRUG LOADED
	Uncross-Linked Strips	
01	SPST1	10
02	SPST2	20
03	SPST3	30
	Cross-Linked Strips	
04	SPST4	10
05	SPST5	20
06	SPST6	30

**Table 3: Observations for Standard graph of Sparfloxacin**

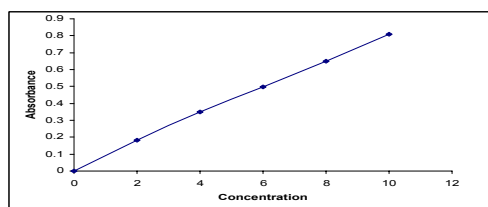
Calibration curve for Sparfloxacin were plotted, absorbance of different concentrations of drug samples were taken at 297nm.

Serial Number	Concentration (µg/ml)	Absorbance*(297nm)in pH 6.6
1	0	0.000
2	2	0.1823±0.028
3	4	0.3496±0.004
4	6	0.4954±0.024
5	8	0.6492±0.029
6	10	0.8091±0.017

\* Mean of 6 replications.

$$y = 0.0193x + 0.4302$$

$$R^2 = 0.9983$$



**Figure 1: Calibration curve of Sparfloxacin**

## CHARACTERIZATION OF DRUG LOADED POLYMERIC STRIPS

:-Physical

characterization is meant for physical integrity of the dosage form. The extent of drug loading is not same as the theoretical drug loading. The difference in the drug content may be because of variation in the densities between drug and polymer.

### Weight Determination of Polymer Strips

The weight of each strips of size 7.5×2.5mm was reported. The weight of strips varies from 2.12 mg to 3.13 mg.

### Thickness of the Polymeric strips

The thickness of each strip was measured using a screw gauge, 0.55 – 0.72 mm is the range of thickness of the strip made. Compared to 10% and 20% strips loaded with sparfloxacin (30%) showed higher thickness. The standard deviation values were low indicating that the uniformity is ensured in all the batches of strips.

### III. Tensile Strength of Polymeric Strips

The tensile strength of each strips of size 7.5 × 2.5 mm was evaluated by Allen's formula tensile strength was calculated.

$$\text{Tensile strength} = \frac{\text{Break force}}{a \times b} \left( \frac{1+\Delta L}{L} \right)$$

Where a, b and L are width, thickness and length of the test strips respectively and  $\Delta L$  is the elongation at break.

The tensile strength of strips of was found to be 131.54 – 242.84 gm/sq.mm. By increasing the presence of drug in the strip we can increase the tensile strength. By crosslinking the strip with glutaraldehyde we can reduce this property as well.

### IV. Hardness of the Polymeric Strips

The hardness of strips was found to be 192 – 279 gm. There exhibited an increased the hardness of the strips when we have substantially increased the drug content in the strips. The hardness is more in 30% than 20% and 10% strips hardness is more in case of the Sparfloxacin loaded strips which is of the concentration 30%. The uncross-linked strips exhibited less hardness.

### V. Estimation of Drug Content of the Strips

Strips of Sparfloxacin of known dimension (7.5×2.5mm) were dissolved in a mixture of 1 ml of acetic acid (1%) and ethanol 9 ml and the strips are being crushed gently. Using acetic acid (1%) the drug solution suitably diluted. UV -Visible spectrophotometer is used to take the absorbance at 297nm.

The amount of drug loaded in the polymeric strips is ranging from 95.20% to 99.12%. All the polymeric strips showed, that the amount of drug loaded is more than 95%, There were no significant difference in drug content among these strips.

**Table 4: Mean weight, thickness, hardness, tensile strength and Drug Content**

Strips code	Weight *(mg)	Thickness *(mm)	Hardness *(gms)	Tensile strength* (gm/sq. mm)	% Drug content*
SPST1	2.12	0.55	192	134.21	95.20%
SPST2	2.32	0.61	271	131.54	96.79%
SPST3	2.84	0.72	235	173.26	95.85%
SPST4	2.36	0.58	217	185.70	96.57%
SPST5	2.45	0.60	213	235.26	98.30%
SPST6	3.13	0.67	279	242.84	99.12%

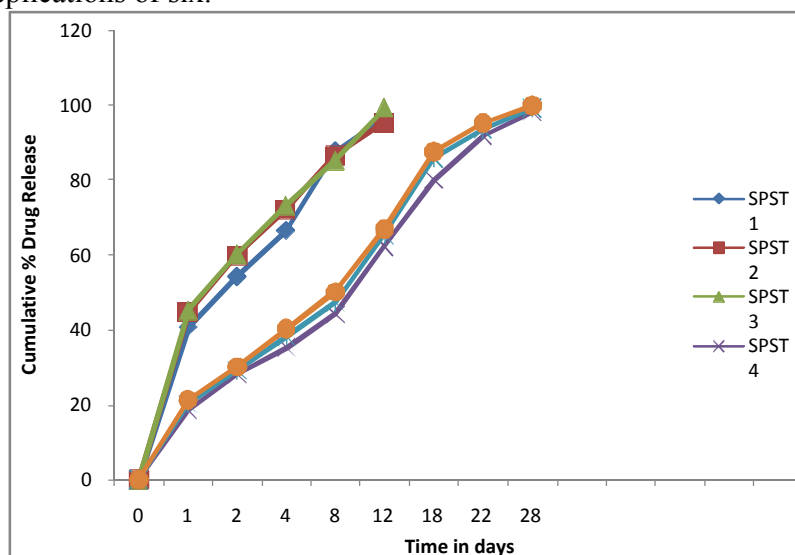
\* The mean is taken

**VI. STATIC DISSOLUTION STUDIES** :-Strips were taken in 6 sets, after weighing placed in test tubes filled with Phosphate buffer at pH 6.8 is then replaced freshly, UV/Visible spectrophotometer is used, at 297 nm. These drugs use different transport mechanisms like passive or facilitated diffusion, dissolution etc as the means of controlling the rate of drug release since the drug is soluble.

**Table 5: Static dissolution rate studies data for chitosan strips containing sparfloxacin.**

S.No	Time in days	SPST1	SPST2	SPST3	SPST4	SPST5	SPST6
1	1	40.79	44.75	45.21	18.66	20.21	21.46
2	2	54.35	59.89	60.25	28.25	29.14	30.21
3	4	66.62	72.31	73.21	35.31	38.21	40.32
4	8	87.80	86.80	85.15	44.25	47.32	50.21
5	12	96.64	95.49	99.28	62.42	65.14	67.05
6	18	-	-	-	80.13	85.96	87.53
7	22	-	-	-	92.11	93.54	95.21
8	28	-	-	-	98.42	99.23	99.98

\*these are the replications of six.



**Figure 2:- The release profile of sparfloxacin from chitosan strips**

The burst re-release was declined by a percent of thirty at the first day and day two the release profile was found in SPST4 (28 %) and SPST5 (29 %) and SPST6 (30 %). It showed a constant pattern from third day and after one month it was regarded as unfit for further studies. The integrity is lost.

**KINETICS OF THE DRUG** :-This data is looked upon for the estimation and to check whether it is linear. Using MS EXCEL statistical functions all the data were processed and the regression analysis is carried out. A perusal to Table 6 indicated that the first order was followed by our drug and it is clearly stated in regard with the plot according to R<sup>2</sup> values for all the strips. SPST6 was found as better formulation among the crosslinked strips. This is an encouraging observation.

**Table 6: Comparison- Order of in-vitro release**

Formulation	In-vitro release (in phosphate buffer) pH 6.6	
	Regression equations.	
	Zero order	First order

SPST1	$y = 6.650x + 27.67$ $R^2 = 0.9721$	$y = -0.052x + 2.014$ $R^2 = 0.957$
SPST2	$y = 6.452x + 31.27$ $R^2 = 0.9512$	$y = -0.122x + 1.927$ $R^2 = 0.966$
SPST3	$y = 6.003x + 32.32$ $R^2 = 0.9347$	$y = -0.085x + 1.851$ $R^2 = 0.950$
SPST4	$y = 3.262x + 16.44$ $R^2 = 0.9587$	$y = -0.051x + 2.036$ $R^2 = 0.952$
SPST5	$y = 3.312x + 19.58$ $R^2 = 0.9111$	$y = -0.048x + 2.004$ $R^2 = 0.951$
SPST6	$y = 3.443x + 17.45$ $R^2 = 0.9765$	$y = -0.108x + 1.934$ $R^2 = 0.991$

**Mass Balance Study** :-Mass balance studies were performed to estimate the leftover drug content in the strip. The amount of drug release in static dissolution studies plus the recovered residual drug content from the strips and the difference is less than 3% compared to its original. It is not bound to the polymer in terms of chemical or physical attachment.

**STABILITY STUDIES**:-All the polymeric strips are subjected to the examination based on its colour, appearance, flexibility and drug content in order to determine its physical state for six months. There were no colour changes in all the strips containing sparfloxacin. The drug content data obtained and was not more than 5% differed. Further taking UV scanning of sparfloxacin strips stability is confirmed. Single peak signifies there is no changes in the lambda max.

**CONCLUSION**:-The present study may confirm the ability of Sparfloxacin strips to treat periodontitis. These strips deliver sparfloxacin in a specific manner in the pocket. Side effects are less and patient compliance is more. This type of drug delivery systems can produce controlled and desired levels of drug at the site of action with no side effects in comparison to conventional drug therapy. Since the technique applied for preparation and evaluation of strips was simple and economical, these types of drug delivery systems are beneficial, economical to the patients.

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## **The Implementation of Blockchain Technology in the Healthcare Environment: Review**

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### **ABSTRACT**

As a decentralized and distributed system, blockchain technology eliminates the need for a central authority via the use of distributed ledgers. The employment of cryptographic principles and procedures helps to assure the security and reliability of transactions. Blockchain technology was born as a result of the rise of bitcoin and has since garnered widespread acceptance and use across a wide range of industries. Healthcare is one sector where blockchain technology has tremendous promise since it can be used to link disparate systems while also improving the integrity of electronic healthcare data (EHRs). Learn about cutting-edge blockchain research in the healthcare business with this in-depth study! The outcomes of this study will shed light on a range of blockchain applications in healthcare, as well as on the issues that have arisen and the potential future directions for blockchain research in this field, among other aspects. It is vital to present some background information before going into detail about the research strategy. A full study of the findings follows, including a bibliometric overview, data analysis, and an evaluation of the quality of the literature is conducted after that. Then the findings of the investigation are discussed in detail. It has been discovered that, among other things, blockchain technology is becoming more popular in the healthcare industry, where it is utilized for data exchange, health record management and access control. There are times when things go wrong. To propose novel structural designs, including frameworks, a structure, and models, is the purpose of the great bulk of research. The data also demonstrates that the vast majority of publications do not include technical information about the blockchain components that are being utilized, nor do they provide prototypes or implementation details. A prototype blockchain implementation is often supplied without any information about the blockchain itself being published.

**Keywords:** healthcare; blockchain; consensus; distributed systems

### **INTRODUCTION**

As a decentralized and distributed system, blockchain technology eliminates the need for a central authority. The employment of cryptography principles and methods ensures the security and reliability of financial transactions. Blockchain technology was born as a result of the rise of Bitcoin, and it has since achieved widespread acceptance and use across a wide range of industries. Healthcare is one sector where blockchain technology has enormous promise since it can be used to link disparate systems and improve the integrity of electronic healthcare data (EHRs). Learn about cutting-edge blockchain research in the healthcare business with this comprehensive study! The outcomes of this study will shed light on a number of blockchain applications in healthcare, as well as on the issues that have arisen and the potential for future blockchain research in this field. It is vital to present some background information before delving into the specifics of the research technique. A full examination of the findings follows, including a bibliometric overview, data analysis, and an evaluation of the quality of the literature. Following that, the outcomes of the analysis are discussed in detail. According to the research, blockchain technology is becoming more popular in healthcare, where it is being



utilized for a variety of purposes, including data exchange, health record management, and access control. Exceptional events have occurred. The great bulk of research is conducted with the purpose of proposing new structural designs, such as frameworks, structures, or models. The data also demonstrates that the vast majority of publications do not publish technical information about the blockchain components that are being utilized, nor do they give prototypes or implementation details. When a blockchain prototype implementation is supplied, it is typical for no information about the blockchain to be revealed.

## **BACKGROUND**

As a decentralized and distributed system, blockchain technology eliminates the need for a central authority by eliminating the necessity for centralized authority. Using cryptographic principles and procedures, it is possible to assure the security and reliability of financial transactions. When bitcoin first appeared, it paved the way for the development of blockchain technology, which has since achieved widespread acceptance and has been used to a wide range of various industries. Healthcare is one sector where blockchain technology has enormous promise since it can be used to link disparate systems while also improving the integrity of electronic healthcare data (EHRs). Learn about cutting-edge blockchain research in the healthcare business by reading this comprehensive report! The outcomes of this study will shed light on a number of blockchain applications in healthcare, as well as on the issues that have arisen and the potential future directions for blockchain research in this field. It is vital to offer some background information before going into detail about the research strategy. A full examination of the findings follows, including a bibliometric overview, data analysis, and an evaluation of the quality of the literature is carried out.

### **Blockchain**

As a result of the widespread use of blockchain technology, which is a decentralized and distributed system, the necessity for a centralized authority has been eliminated. The use of cryptography concepts and methods assures the security and dependability of financial transactions and transactions in general. Blockchain technology was conceived as a consequence of the growth of cryptocurrencies, and it has since gained significant adoption and use across a wide variety of sectors and applications. In the healthcare industry, for example, blockchain technology has tremendous potential since it can be used to integrate different systems and enhance the integrity of electronic healthcare data (EHRs). Find out about cutting-edge blockchain research in the healthcare industry by reading this comprehensive report! Following the completion of this study, it will be possible to learn more about a variety of blockchain applications in healthcare, as well as the problems that have been encountered and the possibilities for future blockchain research in this sector. Before delving into depth regarding the study process, it is critical to provide some background information to the reader. In the next section, the results are extensively investigated, and this includes providing a bibliometric overview of the literature, doing data analysis, and evaluating the overall quality of the material.

### **Blockchains Types**

It's important to understand that blockchains are available in a number of forms and sizes, each with its unique set of characteristics and characteristics. In addition to public, private, and consortium entities (which need public permission), all publicly available data is maintained on the public permissionless (also known as simply public) blockchain (also known as the public ledger). It is possible that encrypting portions of the blockchain will aid in the preservation of anonymity. Anyone may participate in and operate as a basic node or miner on an open

blockchain without obtaining prior authorization (node). In bitcoin networks, for example, these blockchains are frequently compensated financially for their contributions. Blockchains are used by cryptocurrencies such as Bitcoin, Ethereum, and Litecoin [3, 7, and 35]. A private blockchain may consist of just a small number of nodes. Because of this, it is network that is centralized yet dispersed at the same time [9]. When using a private blockchain, the nodes that are allowed to conduct transactions, execute smart contracts, and mine are tightly regulated. They are under the management of a reputable company. In a private context, it is only used in a limited capacity. Hyperledger Fabric [36] and Ripple [37] are two examples of distributed ledger technologies. In the literature, there are numerous categories to consider. Blockchains may be divided into the following categories when it comes to tracking digital assets (such as Bitcoin) and performing particular logic: To put it another way, intelligent contracts. Tokens are utilized in certain blockchains (such as Ripple, Bitcoin, and Ethereum), however they are not used in other blockchains (such as Bitcoin) (e.g., Hyperledger Fabric).

### **Protocols for Distributed Consensus**

Always keep in mind that blockchains exist in a number of forms and sizes, each with its unique set of attributes. This is important to know. In addition to public, private, and consortium organizations (which need public permission), all publicly accessible data is maintained on the public permissionless (also known as simply public) blockchain (which requires no permission from anybody). In order to ensure anonymity, parts of the blockchain may be encrypted. Everyone may join and act as a basic node or miner on an open blockchain without the need for prior authorization, allowing anyone to participate (node). In bitcoin networks, for example, these blockchains are frequently rewarded with money. In addition to Bitcoin, Ethereum, and Litecoin [3,7,35], blockchains are used by other digital currencies. The distributed consensus procedure [9] must be participated in by all members of the consortium. One industry or a number of industries may make use of this technology. When a consortium blockchain is developed inside an industry, it is relatively regulated and only allows for limited public access to the network (e.g., finance). The public may participate in an industry consortium (insurance, banking, and government) that maintains a somewhat centralized trust while yet being open.

### **Blockchain in Healthcare**

It's important to remember that blockchains are available in a variety of shapes and sizes, each with its own set of characteristics to consider. In addition to public, private, and consortium entities (which require public permission), all publicly available data is stored on the public permissionless (also known as just public) blockchain. It is possible that encrypting bits of the blockchain will aid in maintaining anonymity. Anyone can join and serve as a basic node or miner on an open blockchain without the need for prior authorization. In bitcoin networks, for example, these blockchains are typically rewarded monetarily. Bitcoin, Ethereum, and Litecoin are examples of blockchains [3,7,35]. A private blockchain can have only a few nodes participating in it. [9] As a result, it has the characteristics of being both a centralized and decentralized network. On a private blockchain, the nodes that are allowed to perform transactions, execute smart contracts, and mine are tightly controlled. They are managed by a reputable company. Currently, it is only used in a private setting. Hyperledger Fabric [36] and Ripple [37] are two examples of distributed ledger technology. In the literature, there are several classifications. Blockchains can be divided into the following categories when it comes to tracking digital assets (such as Bitcoin) and executing specific logic: (In other words, intelligent contracts.) Tokens are used in certain blockchains (such as Ripple, Bitcoin, and

Ethereum), but they are not used in other blockchains (such as Bitcoin).

- Is it necessary to save data (about the authors of a state)?
- Do you need multiple write permissions?
- Is there a TTP that is available at all times?

It's important to remember that blockchains come in a variety of shapes and sizes, each with its own set of characteristics. There are three types of entities: public, private, and consortium entities (public permission). All public data is stored on the public permissionless (often referred to as just public) blockchain. It is possible that encrypting bits of the blockchain will assist in maintaining anonymity. Anyone can join and serve as a basic node or miner on an open blockchain without obtaining prior authorization. These blockchains are typically rewarded monetarily in bitcoin networks, for example. Bitcoin, Ethereum, and Litecoin are examples of blockchains [3, 7, 35].

## CONCLUSIONS

We'll look at some of the current blockchain research trends in healthcare in this post. Because of the sensitive nature of the data being processed and handled, blockchain technology is considered as having significant potential for application in healthcare. The study's goal was to assess blockchain research and applications in the healthcare industry. This was done by restricting the examined literature to 34 studies and employing research questions that had already been established. Following that, they were examined. We searched nine distinct online databases for publications published between 2008 and 2021. Three reviewers sifted through the 33 publications for the in-depth review. We gathered information to answer our research questions and rated the articles using a set of criteria. According to our data, blockchain technology research and use in healthcare have risen. Blockchain is being researched in the healthcare industry for data exchange, health records, and access control, but not for supply chain management or pharmaceutical prescription administration. As a consequence, the bulk of blockchain's potential remains untapped. Blockchain technology is being used in the majority of healthcare research to establish a new framework, architecture, or paradigm. Define the blockchain platform, consensus algorithm, blockchain type, and the usage of smart contracts. Smart contracts, which automate activities on a blockchain network, might be utilized more often in the future. The majority of studies will provide a prototype or, at the very least, instructions on how to put it together. Because blockchains are a relatively new technology in healthcare, further applications may be explored in the future. Finally, blockchain should only be utilized when it is necessary and suitable.

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## STUDY OF SELENIUM FOR PHOTOVOLTAIC APPLICATIONS & CHARACTERIZATION WITH DISSIMILAR DOPANT

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**ABSTRACT**-This mini review includes brief overview of three generations of solar cells, definitions of major photovoltaic (PV) parameters, mechanisms, advantages & limitations of various types of solar cells, such as multifunction, thin film, quantum dot, dye sensitised, & perovskite solar cells, & what role earth abundant selenium can play in each type of solar cell, as well as comparative study of benefits & challenges that selenium can offer in terms of PV. Photovoltaic characteristics of selenium-doped silicon photodiodes were investigated in this study. Effect of impurity absorption range illumination on current-voltage & spectrum features of produced device was investigated. Photo response was observed to be dependent on electric intensity, current, & radiation power at sample. Current sensitivity of constructed structures at forward bias was found to be greater than that of photo resistors in this study. Photosensitivity & detectivity were both up to  $2.85 \times 10^{-16} \text{ WHz}^{-1/2}$  &  $2.11 \times 10^{11} \text{ cmHz}^1/2\text{W}^{-1}$ .

**KEY WORDS**- Selenium, Application, Photovoltaic, Dopant.

**INTRODUCTION**-As worldwide need for energy grows every day, energy generation has become major concern. Exploring renewable energy sources like solar & wind energy, which do not have negative environmental consequences of fossil fuel burning, is becoming realistic choice. Solar cells with high conversion efficiency of solar energy to electric energy require careful selection of energy elements. This review will cover mechanisms, benefits, & drawbacks of various types of solar cells, including multi-junction, thin film, quantum dot, dye sensitised, & perovskite solar cells, as well as role of selenium in each type of solar cell, with comparative analysis of benefits, major players, & cost analysis. Ability to fabricate monolithic thermal imaging systems, photodetector arrays, & charge-coupled devices based on extrinsic silicon has aided development of extrinsic photodetectors. Fact that silicon integrated-circuit technology has advanced makes it easier to design these devices. In mid-1970s, researchers looked into photoconducting capabilities of selenium-doped silicon for first time. Low selenium concentrations & high compensation ratios characterized early experiments, resulting in poor detector performance. Selenium is n-type impurity with low boiling point temperature ( $690^\circ\text{C}$ – $700^\circ\text{C}$ ) that diffuses quickly in silicon. These variables make doping silicon during silicon crystal development, which takes place at around  $1410^\circ\text{C}$ , more difficult, but they allow doping following crystal growth via closed quartz tube. Diffusion temperature, quench technique, diffusion time, & diffusion vapor pressure are factors in closed tube diffusion. Reduction of selenium salt with reducing agent, generally in presence of stabilising agent to prevent clusters of selenium atoms from expanding & to get stable nanoparticles in colloidal suspension is used in chemical synthesis of elemental nano-selenium. As synthetic processes, varieties of methods have been used, including physical evaporation, hydrothermal processes, gamma-radiolytic reduction, & sonochemical processes. Biogenic production of Se nanoparticles, on other hand, is often accomplished by reducing selenate/selenite in presence of bacterial proteins or plant extracts including phenols, flavonoids, amines, alcohols, proteins, & aldehydes. More than 16 distinct bacteria & viruses have been discovered that can convert colourless selenite & selenate to red elemental Se of various shapes & sizes. When handled effectively, plants, fungus, & microorganisms may work as both creators & defenders of environment. Bacteria, plant extracts, & natural resources have been discovered to be excellent alternative method for green synthesis, as it does not require use of toxic chemicals & has number of advantages, including

environmental friendliness, cost-effectiveness, & suitability for pharmaceutical & biomedical applications. Selenium may be found in variety of crystalline & amorphous forms, however shape, size, & structure of selenium nanoparticles are influenced by variety of parameters such as concentration, temperature, biomolecule type, & reaction mixture pH. As result, characteristics of Se nanoparticles vary depending on their size & form. Se nanospheres, for example, have been shown to have great biological activity while being low in toxicity, whereas Se nanowires have high photoconductivity.

### REVIEW OF LITERATURE

Akhoondiet al. In 2013, iron pyrite nanoparticles were synthesized in mixed reactor using aqueous strategy. Several techniques have been investigated for unaltered iron pyrite, such as soluble extraction, reaction with sodium thiosulfate ( $\text{Na}_2\text{S}_2\text{O}_3$ ), & heat treatment. Most suitable for cleaning pyrite is heat treatment of  $300\text{ }^\circ\text{C}$  for 2.5 hours.

Baiet al. 2013 shows combination of pure pyrite in polar solvents & aqueous diffusions. Mixture showed crystallographic perfection & high consistency.  $\text{FeS}_2$  nanoparticle is formed when molar size of  $\text{Fe}^{2+}:\text{S}_2\text{O}_3$ : TGA was 1: 4.5: 4, while nanowires & nanowires (80 -120 nm) in width were obtained when molar expansion of  $\text{Fe}^{2+}$ : TGA was 1: 3 & 1: 2 independent.

Bhar et al. In 2013 they will be reserved for film Light  $\text{FeS}_2$  with preliminary phase. Iron nitroprusside  $[\text{Fe}(\text{CN})_5(\text{NO})] \cdot 1.5\text{H}_2\text{O}$  was treated with sodium sulfide versus sulfide to produce iron disulfide film due to strong influence of nitroprusside.  $\text{FeS}_2$  film recorded with single source precursor showed high counterfeiting (84%) of Bengali light pink tungsten 300 minutes.

Chen et al. In 2017, he studied vacuum-permeable iron pyrite mixture by sulfiding iron oxide from Prussian blue. reaction interaction was carried out synthetically in just 30 minutes & less with no loss of time, eg less sulfur uptake.

Gallardo et al. 2016 group of nanobars with enhanced photocatalytic movement & essentially 95% methylene blue (MB), divided into one hour of ultraviolet light (10W LED light).

Degradation reaction followed initial stress pseudo-dynamics with high association coefficient ( $R^2 > 0.99$ ). Photo created electrons & openings that added to oxidation; diminished reactions lead to overt hydroxyl (OH) extremists that could profitably break down any natural color into simple things.

Gong et al. 2013 showed improvement in  $\text{FeS}_2$  nanocrystals due to limited bonding methods. Influence of size, shape & distortion could influence development of nanocrystals. Update of gems depends on reaction temperature of laptop, destruction of disfigurement & hardening time.

Lite al. 2011 combined homogeneous & monodisperse pyrite microspherulites with microwave-assisted polyol strategy. Decrease in sulfur causes  $\text{Fe}^{2+}$  to react in half with sulfur species. Development of plot & morphology of matter could be limited by extension of PVP. Pyrite microspherulites have been described on basis of nanocrystal mixing tool. Pyrite was constantly patterned & fully developed by Ostwald, resulting in homogeneous, monodisperse microspherulites.

Maman et al. 2011 incorporated into it pyrite powder with counter-rotating grain distance of few nm to 1 m in solvotermischen method. combination of reaction temperature & development time accepted basic coverage. Suitable condition for removal of pyrite was considered to be  $200\text{ }^\circ\text{C}$  & development time of 24 hours.

Shruti Sharma et. Al. 2015 interesting study provided some experiences on further development of solar cell-based device. Upgrades often come at expense of capacity. When selecting utility of solar cell for particular geological area, it is important to understand basic segments &



components of some solar enhancements that are generally thought of & tested. Then to next breaking down provided models & views.

Trino et al. 2017 Express combination of periods of undegraded cubic pyrite (80 nm) comparable to cycle (30 nm) of nanocrystals formed by hot implantation techniques. Scene, nature & morphology would have been influenced by molar structure of powerful sulfur spring to begin construction of east connection.

Vadkhiya et al. In 2011, State Thickness, Compton Profiles & Materiality assemblies opted for iron pyrite by atomically mixing orbital directly. Compton profiles & longlines were identified. Cross-sectional & cross-sectional profiles & anisotropies were illuminated by Hartree-Fock system hybridization & utility thickness speculation (DFT). Optical properties were determined for essentiality at 3-4 eV using most extreme extended plane wave (FP-LAPW) method. Liet al. In 2011, controlled mixture of pure pyrite nanocrystals was declared by hot reaction of iron-oleylamine complex with sulfur-oleylamine. Iron compound oleylamine could affect state of nanocrystals by controlling concentration of core & improving energy.

Wang et al. 2012 orchestrated FeS<sub>2</sub> films with sulphidate Fe<sub>2</sub>O<sub>3</sub> films at different temperatures from 400 to 600. Surfaces of repulsion zones have surface imperative & essentiality of interface could be related to different sulphidation temperatures. Microstructures, such as thickness of failures jewelry, can influence optical & electrical properties. Electrical obstruction increases as optical detection coefficient & bandwidth decrease as temperature of sulfide increases. Ordinary photovoltaic (RPV) modules consist of layers of apex mixed with polymers. Tower cladding systems with additives such as 1,8-dioctadecane (DIO) & polystyrene (PS) with different obsessions have greater influence on limit values of photovoltaics, such as fill factor, gross obstacles & variations in efficiency energy etc. Image & surface morphology of individual layers are examined exclusively by perceptible UV spectroscopy, atomic force microscopy (AFM). In photopolymerizable solar cells, buildings based on terpyridine & quaterpyridine allow large amount of oscillate light based on sunlight. Bipyridine Terpyridine plans to produce metal frames with lower band openings in Metal Legend Progression (MLCT) that will allow for unprecedented absorption at lower essential frequencies along that line & allow for limited enhancement of sunlight.

Wang et al. In 2015, pyrite was made with large-scale 3D squares & smaller octahedron with incredible texture using liquid polymer assisted process. Cubic & octahedral pyrite crystals were prepared using sulfur, FeCl<sub>2</sub>·4H<sub>2</sub>O in vicinity of polyvinylpyrrolidone (PVP) & polyvinyl alcohol (PVA), regulated by NaOH center. Reaction limits could affect size of thing. Evaluation groups for NaOH & polymer were needed to improve morphology.

Zhang et al. 2011 FeS<sub>2</sub> well tested & established by strong government backlash Molecular size could affect electrochemical properties. Improved electrochemical properties correlate with stronger compression, more stable construction, & better electrical fit. Particles smaller FeS<sub>2</sub> is combined with thickness lower press, leading to reduced solid surface & less electrochemical competition.

Zhang et al. In 2013, when gems were coordinated, FeS<sub>2</sub> microspheres contained 2D submicroflakes with width & length of 0.5 to 1 μm & thickness of 60 nm when PVP surfactant was used. Morphologies of FeS<sub>2</sub> mixed with or without PVP were examined.

Zhu et al. 2012 used aqueous strategy for several leveled cubic pyrite gems with specially described aspects (100) in proximity of different stewards that reduce ethylenediamine & PVP. Nucleation & dispersion improved when ethylenediamine was chelated with Fe<sup>2+</sup> & reacted with S. PVP could be due to its ability to be descendant that acts as level control, like normal expert

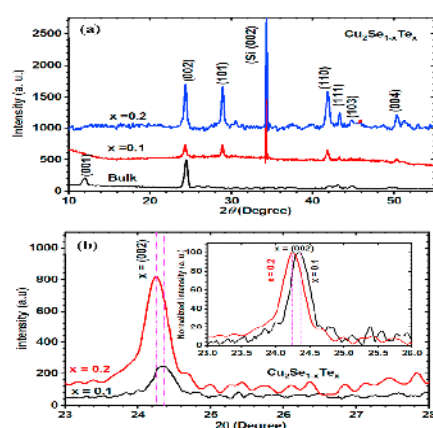
that on surface by binding to iron molecule on surface of  $\text{FeS}_2$  (111) forms, it binds intermittently (100) -Highlights achieved. Morphology & translucent stages were influenced by oxidation state of iron particles & type of anions in iron precursors.

## RESULTS & DISCUSSION

### XRD ANALYSIS

The XRD pattern obtained at room temperature on  $\text{Cu}_2\text{Te}_{1-x}\text{Se}_x$  ( $x = 0.1, 0.2$ ) thin films placed on silicon substrate & their corresponding initial bulk is shown in Fig. 1(a). All of studied films were found to be polycrystalline, with diffraction lines indexed to (002), (101), (110), (111), (103), & (004), all of which are consistent with hexagonal structure as stated in JCPDS card no. 65–3460.  $\text{Cu}_2\text{Te}$  has most intricate crystal structure among copper chalcogenides families, according to our understanding, & it is frequently found with its nonstoichiometric compound  $\text{Cu}_2\text{-Te}$ . However, no diffraction peaks of additional phases or contaminants were found in this study.

Figure-1-XRD diffractogram of various compositions of  $\text{Cu}_2\text{Te}_{1-x}\text{Se}_x$  thin films & powder ( $x = 0.1, 0.2$ ).



**HRTEM Study**-The structural features of  $\text{Cu}_2\text{Te}$  doped with very tiny proportion of selenium may be studied using high-resolution transmission electron microscope (HRTEM) planar images as well as SAED. Low-magnification HRTEM planar micrograph of  $\text{Cu}_2\text{Te}$  doped with 0.2 mole Se was shown in background picture of Fig. 2. This picture shows some well-organized grains with hexagonal form. Atomic distinct planes as well as aligned crystal lattice planes may be seen in left inset planar picture. Distance between these planes was calculated using software coupled to HRTEM equipment for two consecutive flights & average of all planes. Interplanar distance ( $d$ ) has been discovered to correlate to (002) (101) (102) miller indices, which are also indexed by XRD diffractogram. Selected area electron diffraction (SAED) patterns for 0.2 mol Se-doped  $\text{Cu}_2\text{Te}$  were shown in right inset image. 2.15, 3.48, 3.84, 2.67, 1.93, & 2.17 nm are measured interplanar spacing values for (110), (101), (002), (103), (004), & (103), respectively. All of values of  $d$ -spacings are larger than values of JCPDS card no. 65–3460, suggesting lattice deformation induced by inclusion of Se. XRD pattern is supported by HRTEM data.

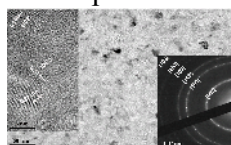


Figure 2: background picture is low-magnification HRTEM image; right inset image is high-magnification HRTEM image exhibiting atomic distinct; & left inset image is  $\text{Cu}_2\text{Te}_{0.8}\text{Se}_{0.2}$  thin film's selected electron diffraction pattern (SEDA).

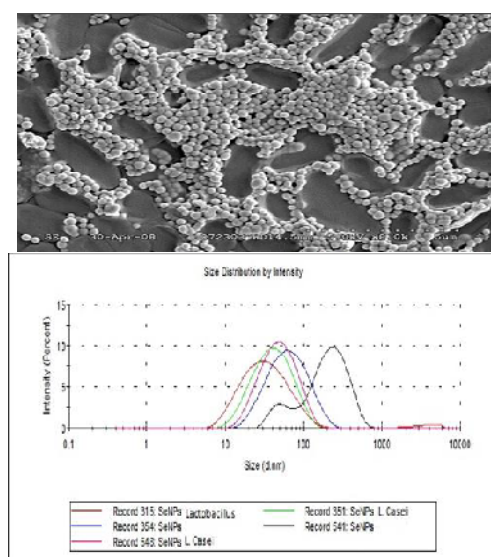


Figure 3 shows SEM morphological aspect (a) & DLS analysis (b) of SeNPs generated using *Lactobacillus casei* as microbiological reducing agent.

**CONCLUSION**-The structural, optical, & electrical characteristics of Cu<sub>2</sub>Te thin film may be significantly altered by doping it with little quantity of selenium. EDAX analysis of composition revealed decrease in Te with matching increase in Se mole, showing that Se was successfully incorporated into Cu<sub>2</sub>Te matrix. Hexagonal unit cell has little deformation along a - & c axes, as seen by XRD pattern & SAED profiles. Difference in atomic radii between Se & Te causes this deformation, which is thought to have significant impact on changes in optical & electrical characteristics. FESEM & AFM results show that grains are highly defined, consistent, & virtually of identical size, & that they become more discernible as Se concentration increases. Furthermore, when Se increases, surface becomes smoother, making films easier to use in layered configuration devices. Addition of Se lowers band gap energies to 1.45 & 1.65 eV, which is compatible with solar spectrum, allowing them to be used as photoactive layer in photovoltaics. All other optical constants, such as refractive index, third-order nonlinear susceptibility, absorption coefficient, & so on, were changed by doping Cu<sub>2</sub>Te with Selenium. When Se is raised, electrical statistics show that conductivity, thermoelectric power, & power factors all rise.

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## **EBOLA VIRUS – A Review**

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**Abstract:**-Ebola virus disease (EVD), formerly known as Ebola hemorrhagic fever, is a rare but severe, often fatal illness in humans. Virus is transmitted to people from animals and spread topopulation.

**Keywords:** Ebola, PPE, Infection

### **WHAT IS EBOLA VIRUS DISEASE?**

A disease caused by the Ebola virus is a condition that is transmitted from animals to humans; this virus spreads through direct contact with the bodily fluids of an infected person or animal [2].

**History of Ebola Virus** -Ebola first appeared in August 26, 1976 in Yambuku, a town in the north of Zaire. He went to the doctor because of his high fever; they gave him quinine shot which is good against malaria [3].

- A week later, he had uncontrolled vomiting, bloody diarrhea, trouble breathing and then bleeding from nose, mouth, andanus.
- He died 14 days after the onset ofsymptoms.
- He started an epidemic that killed 280 of the 318 infected persons (88%).
- Natural Reservoir-Currentlyunknown, Possibly local batpopulation
- Two species were identified in1976:
- Zaire Ebola virus (ZEBOV)and
- Sudan Ebola virus(SEBOV)

### **How is Ebola Virus Disease Spread?**

- Contact with bodyfluids
- Un-sterilized injections.
- Skin piercing instruments that have been used by infectedperson.
- Eating bush meats especially monkeys, chimpanzees, bats and deadanimals.
- Eating fruits that bats or wild animals have partly eaten (batmeat).
- Breastfeeding
- Direct physical handling of person who has died ofEbola.
- When a person dies of Ebola, the body is highly contagious because it leaks fluids containing the virus. That's why nobody should touch the body without special protection [4].

### **Signs & Symptoms Ebola Virus:**

- Fever
- Bloodydiarrhea
- Vomitingblood
- Bleeding through nose,urine
- Muscle & jointpain
- Skinrash

### **Go to a health facility immediately if:**

- You have a sudden fever or diarrhea or vomiting or you have recently come into direct

contact with wounds or body fluids of an infected person.

### **What should be done to someone suffering from Ebola Virus Disease?**

- Proper treatment
- PPE should be used while caring infected person
- Disinfection of used clothes and utensils

**Risk:**-Patients who have died due to Ebola are infectious; anyone who comes into direct contact with their bodies is at risk. Protective wear should be used and handling limited [5].

**Incubation period:** 2-21 days.

### **Diagnosis**

- Blood test

### **Treatment**

- There is no cure for Ebola fever.
- Total isolation /Quarantine.
- Intensive care treatment
- The only available treatments are those meant to help to ease symptoms. These may include:
  - Oxygen therapy
  - Intravenous fluids
  - Blood transfusions
  - Medications to treat shock
  - Pain medications [6].

### **Measures by Govt to Control Disease Spread**

1. Travelers from affected nations to be *screened thoroughly*.
2. *Mandatory self-reporting* by passengers from or transiting through the affected countries at the time of immigration check.
3. Designated *facilities at airports/ports* to manage travellers manifesting symptoms of the disease.
4. States asked to identify nodal *offices and designate hospitals with isolation wards* and keep ready personal protective equipment.
5. Indian Medical Association roped in to *sensitize doctors* about diagnostic and treatment protocols [7].

### **Prevention**

- Persons suspected to have died of Ebola must be reported immediately to a health worker; avoid washing the body and bury immediately.
- Wash your hands with soap under safe running water after handling a patient or the body of a person who has died of Ebola.
- Avoiding meats
- Do not share sharp objects such as needles or razor blades, etc.
- Disinfect clothing and beddings of suspected Ebola patients with bleach, or soap.
- Do not eat fruits that have been partly eaten by bats or wild animals (Bat Mot) [8].

**CONCLUSION:-**The virus spreads through direct contact with body fluids, such as blood from infected humans or other animals. Spread by body fluids of contaminated person.

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## **STUDY TO ASSESS THE EFFECTIVENESS OF PLANNED TEACHING PROGRAM REGARDING KNOWLEDGE OF MALNUTRITION AMONG PARENTS OF UNDER-FIVE CHILDREN AT SELECTED RURAL AREA OF JABALPUR CITY”**

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### **ABSTRACT**

**INTRODUCTION**-Every country in the world is affected by one of the many forms or types of malnutrition. Malnutrition in all its forms is one of the greatest challenge to health globally. Women, infants, children and adolescents all are at risk of malnutrition. Optimizing nutrition in early life ensures the best possible start of life, with long -term benefits health wise. Nearly 22.9 percent of children aged 12-17 months are stunted and the prevalence is upto 25.7 percent among children aged 36-47 months.

**METHOD**-The research approach adopted for this study was experimental in nature. A quasi experimental, one group pre test post design was used to evaluate the effectiveness of planned teaching program on malnutrition among parents of under -five year children in selected rural area of Jabalpur city. The data were collected from rural area of Panagar, M.P. using purposive sampling technique. The sample consisted of 60 parents of under -five year children of Jabalpur city to assess the knowledge regarding malnutrition. Data collection tool included structured questionnaires and planned teaching program. The reliability of tool was tested by test -retest method and it was found to be 0.75. The pilot study was conducted on 6 samples to check the feasibility and practicability of proposed research.

**RESULT**-The findings shows that mean post test knowledge score (24.25) is apparently higher than the mean pre -test knowledge score (10.8). The mean score (SD=3.54) is less than that of post test score (SD= 2.833) and computed paired value shows, there is significant difference between pretest and post test mean knowledge score (T=2.74). This indicates that the planned teaching program was effective in increasing knowledge on malnutrition among parents of under-five year children in selected rural area of Jabalpur city.

**CONCLUSION**-The study concluded that the planned teaching program was effective method for providing moderate to adequate knowledge to the parents in selected rural area of Jabalpur city to enhance their knowledge regarding

**KEYWORDS**-Effectiveness, planned teaching program, malnutrition

**INTRODUCTION**-Malnutrition is quite general term for the medical conditions caused by an improper or insufficient diet. It refers to under nutrition resulting from inadequate consumption, poor absorption, or excessive loss of nutrients, but the term can also encompass over nutrition, resulting from overeating or excessive intake of specific nutrients. An individual experience malnutrition when the appropriate quantity, quality or kind of nutrients required are not consumed by him for an extended period of time. This may also result in starvation. Malnutrition affects people in globally. Around 462 million people around the globe are underweight. An estimated 41 million children under the age of 5 year are overweight or obese, while some 159 million are stunted and 50 million are wasted. Along with these numbers are the 528 million or 29% of women of reproductive age around the world affected by anemia, for which approximately half would be amenable to iron supplementation. Many families cannot afford or access enough nutritious food like fresh fruit and vegetables, legumes, meat and milk, while

foods and drinks high in fat, sugar and salt are cheaper and more readily available, leading to a rapid rise in the number of children and adults who are overweight and obese, in poor as well as rich countries. It is quite common to find under nutrition and overweight within the same community, household or even individual – it is possible to be both overweight and micronutrient deficient at the same time. Overweight has no connection with not being malnourished. Malnutrition refers to deficiencies, excesses or imbalances in a person's intake of energy and/or nutrients in diet. The term malnutrition covers two broad groups of conditions. One is 'under nutrition'—which includes stunting (low height for age), wasting (low weight for height), underweight (low weight for age) and micronutrient deficiencies or insufficiencies (a lack of important vitamins and minerals). The other is overweight, obesity and diet-related non-communicable diseases (such as heart disease, stroke, diabetes and cancer). Malnutrition is the lack of sufficient nutrients required to maintain healthy bodily functions is typically associated with extreme poverty in economically developing countries, while malnutrition as the result of inappropriate dieting, overeating or the absence of a "balanced diet" is often observed in economically developed countries (e.g. as indicated by increasing levels of obesity). Nearly 22.9 percent of children aged 12 -17 months were stunted and the prevalence rose to 25.7 percent among children aged 36 -47 months. Nearly 22.9 percent of children aged 12 -17 months were stunted and the prevalence rose to 25.7 percent among children aged 36 -47 months. The rate dropped to 21.3 percent for children aged 48 -59 months, data show. Similarly, 17.3 percent children aged 0 -5 months were underweight while the prevalence rose to 23.3 percent for children aged 48 -59 months. The prevalence of wasting remained fairly steady between 13 percent and 16 percent throughout the first five years of life, while prevalence of overweight remained between 1.7 percent and 3.6 percent. One in four Indian children are malnourished, and mother's education, feeding patterns and government service delivery determine child nutrition in addition to household wealth, according to a new report. Even as India becomes highly urbanized, 22.3 percent of children under five were stunted, 21.4 percent were underweight and 13.9 percent were wasted in ten most populous cities of India, showed the Urban HUNGaMA (hunger and malnutrition) Survey report 2014, released on 7 February, 2018, by Naandi Foundation, a Hyderabad-based non-profit. While children in the highest stratum of household wealth were less prone to being malnourished, children in the lower strata had higher rates of malnutrition, the survey showed. A survey was conducted with the view to assess the nutrition status of children aged 0 -59 months living in the ten most populous cities of India. In which more than 12,000 mothers were interviewed and heights and weights of more than 14,000 children aged 0 -59 months were measured. Cities included in the survey were Mumbai, Delhi, Bengaluru, Hyderabad, Ahmedabad, Chennai, Kolkata, Surat, Pune and Jaipur. Together, they account for 5.3 percent of India's population and 4.1 percent of the child population aged 0 -71 months. In the 10 cities surveyed, 94.4 percent of children were born in hospitals while 88.6 percent were weighed at birth and 37.1 percent of mothers had a cesarean delivery. "Poor infant and young child feeding practices, compounded by the poor status of women, the prevalence of household poverty and lack of government service delivery centre seem to be three major drivers of stunting among urban children" said the report.

#### **Malnutrition In India's Most Populous Cities**

Indicator	Prevalence in children under five (In %)
Stunting	22.30%
Wasting	13.90%
Underweight	21.40%

Overweight 2.40%

**METHOD**-In this study the investigator aimed at finding the effectiveness of planned teaching programme on knowledge regarding malnutrition among parents of under -five children in selected rural area of Jabalpur. The study also aimed to find the association between demographic variables and pre interventional knowledge. The study laid the hypothesis **H1:** There will be mean significance difference between the pretest and post test knowledge score of parents regarding malnutrition. **H2:** There will be significance association between pretest knowledge score of parents regarding malnutrition and selected demographic variables. It was a preexperimental study which selected sixty samples through purposive sampling technique. The study collected data from a structured questionnaire on malnutrition among children under 5. After collecting pre test data intervention was administered and a post test was taken. Inclusion and exclusion criteria for sample selection was **The Inclusive Criteria**

1. All parents living in rural area.
2. Parents who were in age group between 21-35 years.
3. Parents who are familiar with Hindi language.
4. Parents who have under-five year children.

**Exclusive Criteria**

1. Parents whose age is less than 21 & more than 35 years.
2. Parents who are not living in rural area.
3. Parents who are not familiar with Hindi language.
4. Parents who do not have under-five year children.

The present study was delimited to :

1. Parents who had under-five children.
2. Parents who were willing to participate in the study.
3. Parents who were available during the period of data collection.
4. Parents who can understand Hindi /English.
5. Parents of selected area of Jabalpur.

The tool used for the study consisted of two sections. **Sections A: demographic data** - It describes the selected sample characteristics. It comprises of 8 items for obtaining information regarding age, gender, and parent's education, types of family, no. of siblings, monthly income, previous knowledge, and source of information. Section B: - **Knowledge questionnaire** It consists of 30 items of knowledge regarding malnutrition. Scoring was done on following basis:

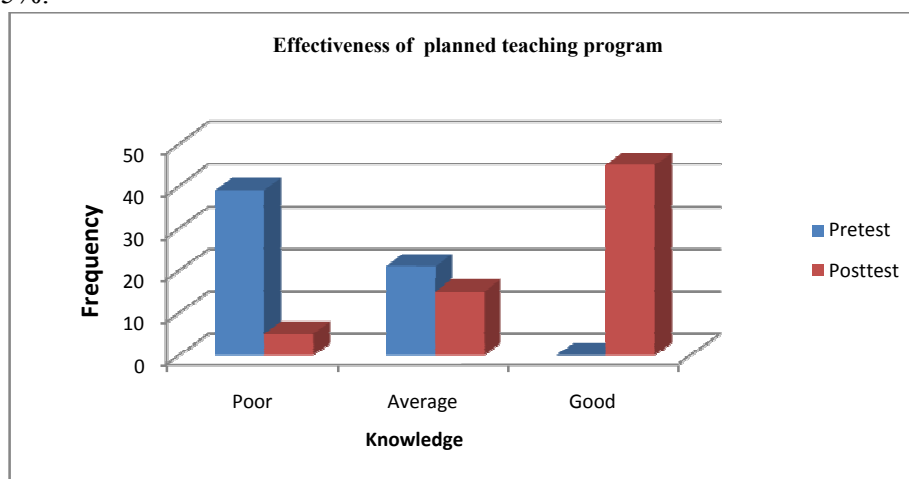
Good 21-30 (70% -100%)  
 Average 11 -20 (34% -66.6%)  
 Poor 0 – 10 (0% -33.3%)

**Section C:** Structured Teaching Program on malnutrition. The tool was tested for reliability on 6 parents of under-five year children.

**RESULTS**-The finding of this study showed that in pre test majority 39 (65%) of the respondent scored poor grade and 21 (35%) scored average grade. The mean score 10.8 & SD was 3.54 whereas in the post-test score that 45 (75%) parents have good knowledge, 15 (25%) parents had average knowledge, and only 5 (8%) parents were found who have poor knowledge regarding malnutrition after administration of planned teaching program. The mean (24.25) & SD (2.833).

S. NO	TEST	MEAN	SD	T-VALUE
1	Pretest knowledge	10.8	3.54	2.74
2	Posttest knowledge	24.25	2.833	

The effectiveness of planned teaching program between pre and post knowledge is made by t - test. The pre test and post test knowledge was statistically tested by applying t -test method at the level of 0.05%.



The finding of the study also showed association between the pre -test knowledge score and selected demographic variable like age of parents of under -five year children, sex of parents, educational qualification of parents, types of family, number of children, monthly family income, previous knowledge about malnutrition, sources of information, pe riod of stopping exclusive breast feeding, period of starting weaning.

S NO.	variables	Poor	Average	Good	Total	DF	Chi-value	P-value	Inference
1	Age in year								
	21-25	11	2	0	13				
	25-30	19	5	0	24	6	180	0	S
	30-35	7	9	0	16				
	>35	2	5	0	7				
2	sex								
	Male	0	0	0	0				
	Female	39	21	0	60	2			NP
3	Education								
	Illiterate	0	0	0	0				
	Primary	6	1	0	7				
	Middle	13	11	0	24				
	High school	11	3	0	14	12	6.65	0.879	NS
	Higher secondary school	9	4	0	13				
	Graduation	0	2		2				
	Post graduation	0	0	0	0				

4	Type of family								
	Nuclear	16	8	0	24				
	Joint	22	12	0	34	4	11.41	0.0762	NS
	Extended	1	1	0	2				
5	Number of children								
	One	11	5	0	16				
	Two	19	6	0	25	6	44.5	0.00001	S
	Three	6	6	0	12				
	>3	3	4	0	7				
6	Monthly family income								
	3000-5000	7	2	0	9				
	5001-10000	26	12	0	38				
	10001- 15000	6	7	0	13	6	11.55	0.0726	NS
	>15000	0	0	0	0				
7	Previous knowledge about malnutrition								
	Yes	5	14	0	19				
	No	34	7	0	41	2	17.244	0.00063	S
8	Source of information								
	Health professionals	0	0	0	0				
	Mass media	0	0	0	0	6			NP
	Any educational program	0	0	0	0				
	Aganwadi	5	14	0	19				
9	Period of stopping exclusive breastfeeding								
	Below 4 month	0	0	0	0				
	6 month	13	10	0	23	6	6.93	0.326	NS
	7-8 month	23	7	0	30				
	9-10 month	3	4	0	7				
10	Period of starting weaning								
	Below 6 month	5	4	0	9				
	6 month	27	16	0	43	6	19.46	0.003	S
	After 8th month	7	1	0	8				
	After 12th month	0	0	0	0				



**CONCLUSION-**The study concluded that teaching program was very effective in increasing knowledge of parents of under five. The scores in post test on comparing with pretest supports this.

### **RECOMMENDATIONS**

The study laid following recommendations had been suggested.

- A similar study can be conducted on a much larger sample for broader generalization.
- The study may be replicated in different settings.
- An experimental study could be under taken with a control group.
- A follow up could be carried out to find out the effectiveness in term of retention of knowledge among the parents in rural areas

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## **Need and Importance of Physiotherapy in Pre-Operative and Post Operative Surgeries and Traumatic Disorders.**

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**Abstract:-**Physiotherapy is a method of treatment that encompasses **rehabilitation**, injury prevention, healing and promotion of holistic fitness. It primarily focuses on the science of movement to address underlying physical issues caused due to injury or disability and help people in restoring, maximising & maintaining their physical strength and vigour. Using a combination of proven techniques and evidence based natural methods like **exercises** and a range of **massage** techniques, the physiotherapist is of help to diagnose the disorder and suggest a treatment plan best suited to improve the patient's **physical well-being** and restore them back to normalcy. One of the main reasons for people seeking treatment is to find lasting relief from pain that could be bothering them and restricting their **mobility** due to a number of factors. Whether the pain or discomfort is due to an injury, frozen shoulder, wrong posture, or some other external factor; physiotherapy not only helps manage the pain & move better but also recognises warning signs and prevent them from happening. Thus saving you from the added pain of the injury associated downtime.

**Keywords:-** Rehabilitation, Physical Well-being, Mobility, Exercises, Massage.

### **Introduction:**

People are suggested the services of a Physiotherapist normally after sustaining physical injuries which may require surgical procedures or relief from traumatic disorders resulting from accidents, injuries or excessive physical activities or even under degenerative processes which include age, climate variations and body resistance.

Some of the most common reasons for which people opt for physiotherapy include:

- Prevention of injuries,
- Work on posture
- Alleviate general pain
- Facilitate stretching & flexibility of joints and muscles
- Heal from a surgical procedure
- Management of disease
- Recover from hip or knee replacement
- Improve body balance

Attending the treatment suggested by a qualified and experienced physiotherapist can provide relief to people of all ages suffering from a variety of ailments & injuries. With the help of high quality physiotherapy you can restore your physical condition to pre-pain and injury fitness level and lead a much active and healthy life. Some of the best known benefits of physiotherapy include:

**Lasting relief from pain:** -Multiple aches and pains in the body could be due to a number of reasons. Be it an ankle injury while playing basketball or Low Back Pain suffered by ladies especially who work for long hours in standing or sitting positions and also due to long hours at work causing burden on the weight bearing joints of the body. If the pain is affecting your everyday routine and activities, it definitely needs immediate attention. Regular physiotherapy

sessions not only help mitigate or even out pain but also reduces your dependency on pain killers that could be expensive or prove harmful in the long run.

**Prevention from surgery:** -While surgery may be unavoidable in certain cases, physiotherapy can help eliminate the need for going under the knife in most of them. Using a variety of treatments that includes a combination of exercises and therapies, it assists in elimination of pain from the root, heal injured tissues and facilitate painless & smooth mobility over a period of time. In case you have already undergone surgery, physiotherapy can help you recover from it faster.

**Improved mobility & balance:** -People who are recovering from a surgery or an injury can take time to get back on their feet. Mobility can be a challenge and doing everyday chores may become an impossible task. In such cases, physiotherapy can prove to be of great help. It not only helps the body regain its lost muscle strength and improve coordination but also gain mobility to move around safely.

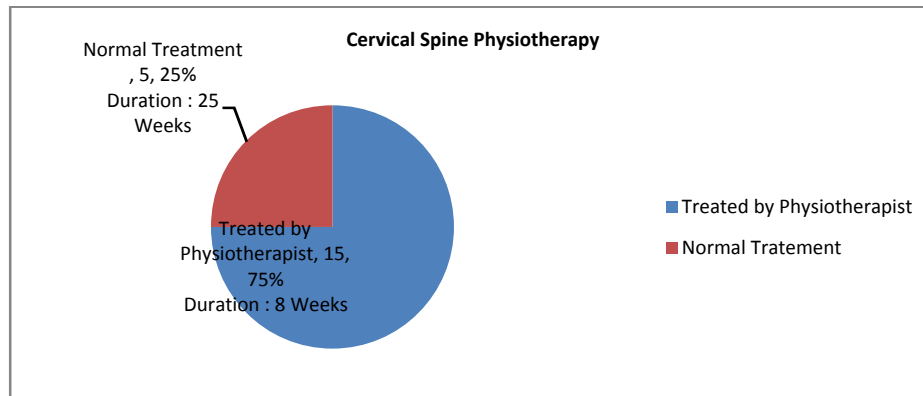
**Manage age related issues:** -With age people tend to develop bones, joints or muscles related complications like osteoporosis and arthritis among others. To tackle these everyday aches and pains, regular physiotherapy can prove to be advantageous. It can also be opted for if a person has had a knee replacement surgery or has been recommended one, or may be hip replacement and is looking to alleviate pain and recover faster.

**Avoid dependency on medicines:** -While the intake of painkillers and analgesic medications may provide instant relief from pain, the side effects of these long term consumption may also affect on the kidneys and liver can prove to be fatal in the long run. Therefore, to address long term pain issues physiotherapy is considered to be a safe and more effective alternative to pain control medication.

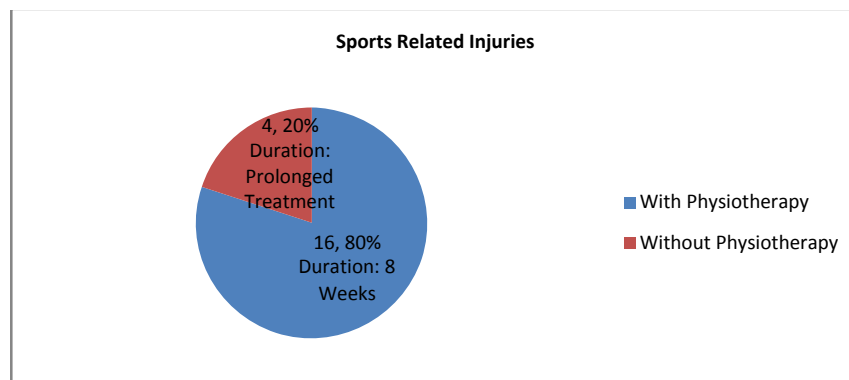
Physiotherapy with long term benefits:

Symptoms	Affect on Body
Posture problem	Back pain, lower back pain, neck pain, shoulder pain, muscle weakness, scapular instability, poor muscle tone, muscle imbalance, hypotonia.
Joint pain	Arthritis, osteoporosis, poorly aligned joints, lupus, joint instability, bursitis, degenerative joints, age related joint ailments
Joint injuries	Sprains & strains in ankle, knees, elbows, shoulder, wrist etc., torn cartilage, dislocated or unstable joints, degenerated meniscus, joint hyper mobility
Recovery from surgery	Hip replacement, athletic injury surgery, tendon surgery, knee replacement, ligament surgery, spinal cord injury surgery, reconstructive surgery, lymph node replacement
Soft tissue injuries	Tennis elbow, golfers elbow, whiplash, Achilles tendinitis, back & neck strain, rotator cuff injuries and tendinitis.
Bruising/Swelling/Edema	Bruising following sports or any other related injury or surgery, contusions, swollen joints, chronic joint or muscle inflammation, lymph edema, lymphatic congestion.

**Case Study:** -A study was conducted upon 20 patients who suffered with **Cervical Spine problems** and were subjected to treatment. 15 Patients who received Physiotherapy were medically cleared within 8 weeks of receiving treatment whereas 5 patients had prolonged treatment of about 25 weeks for the same without physiotherapy.



Similarly, during Sports events, players who suffered injuries related with muscle/ ligament, ankle and shoulder injuries were also subjected to treatment. A sample of 20 players were subjected to treatment. Their findings mentioned as under.



The key role which the Physiotherapist plays is getting you moving to the best of your functional capacity. Using a mix of hands-on treatments like manual therapies to stretch stiff joints & muscles to therapeutic massages to loosen tight muscles to using machines and equipment to address pain related issues; they help you not just diagnose the main reason behind the pain but also work towards complete elimination of it from your system so that you can lead a healthy, fit and pain free life.

A good Physiotherapist will assess your physical condition, educate you on your pain and its related issues and then customize a rehabilitation program specifically suited for your condition.

#### **Special Cases:**

**A] Spinal Related:** For conditions related to spinal cord or those suffering from Alzheimer's, Parkinson's or any other form of brain injury; physical exercises can have a positive impact. By performing therapeutic exercises regularly, you can reduce the impact of neurological disorder from spreading further in the system and improve your bodily movement and coordination.

**B] Cardiac Related:-**If one is facing problems with the heart or circulation of blood and oxygen in the system, a cardiopulmonary physical therapy can help get rid of the problems like heart attack and pulmonary fibrosis; growth strength in key muscles and improve your endurance in the long run.

**Conclusions:-**Every condition is different and every patient heals at different rates. In general, one should attend physiotherapy sessions till they have reached their goal or the physiotherapist decides it's time to stop and re-evaluate the progress.

Typically, it should take anywhere between 6 to 8 weeks for the tissues and muscles to heal and so the physiotherapy must last that long. Sometimes, your condition may rapidly get better, and you may notice an improvement in pain control, range of motion, and strength within a few sessions of physical therapy.

In such a scenario, you may be required to attend 2-3 sessions more before you are discharged or asked to follow the exercise routine at home.

But then again depending upon the severity of your condition and the amount of damage, your physiotherapist might ask you to extend the therapy and continue till you have reached a satisfactory level of progress.

A physiotherapist who understands your lifestyle needs and then tailor makes a treatment plan specific to your condition can help improve your quality of life and recover faster. Therefore, thoroughly discuss your everyday activities and goals with them. Let them know what physical activity you see yourself performing with ease, over a period of time, so that they can chart a course of recovery best suited for your needs.

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## CASE STUDY: TO DEVELOP AN ANDROID APP

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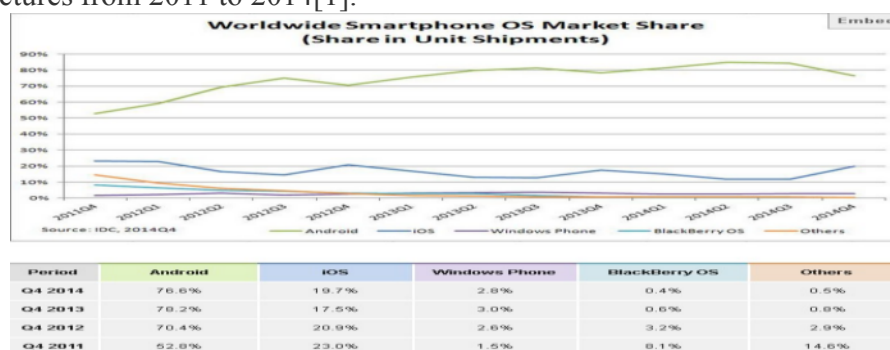
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**Abstract**— Smart telecellsmartphone is taken into consideration an essential innovation that has modified the human existence in numerous aspects. Android has emerged because the maximum broadly used running gadget in Smartphones. Android running gadget is open supply and freely on hand to everyone. When running Android gadgets, you must have plenty of applications (apps) to have fun and entertainment. With cut-throat opposition for numerous examinations, college students have moved from traditional manner of mastering to M-mastering for coaching. The gift paper discusses the layout and improvement of an Android primarily based totally app named as quiz that could assist college students in coaching of aggressive checks like UGC-NET, GATE etc. whilst they're on move. This paper additionally highlights numerous demanding situations confronted with the aid of using builders in Android App Development.

**Keywords**-JDK SE 7, Android SDK, ADT Plugin, Eclipse Juno, Android Apps Development

**INTRODUCTION**:-Nowadays, generation is more and more utilized by individual in each field. As humans flow from one area to another, many Wi-Fi technology are to be hard to stay in touch with others, without regard of the location. The growing reputation of Smartphones has drawn the eye of virtually everybody. Along with making and receiving calls, customers can ship and acquire messages, get entry to the Internet, virtual media, include audio/video recording etc. Smartphones additionally incorporate integrated keyboard, excessive decision digital digicam, the front aspect digital digicam for video conferencing, contact display etc. Different clever telephones have special running structures. A cellular app, brief for cellular software or simply app, is a software which runs on clever telephones, pill or cellular telephones. Apps are pre-set up or downloadable portions of software program which can do nearly everything. Apps make cellular greater like transportable computer systems having multi center processors, gigabytes of reminiscence and an actual running system. Originally cellular apps are made to be had for informational functions that consist of Gmail, calendar, climate data etc. With growth in generation and consumer demands, builders began out to make apps for different functions like games, banking, video chats etc. An app can display the facts comparably as a website, in conjunction with different advantages to download the content material that may be used offline, in case the Internet isn't to be had. There are many apps to be had in marketplace nowadays for special Operating Systems i.e. Android, Blackberry and Apple etc., wherein Android is having the most marketplace percentage those days. Fig. 1 depicts marketplace percentage of various running structures from 2011 to 2014[1].



**Fig. 1**



There are 3 kinds of Mobile Apps: Native, Web-primarily based totally and hybrid. Native Apps stay at the tool. These apps are to be had through a software save and are advanced for a specific platform and completely make use of the functions of that tool. These Apps paintings in offline mode and might paintings on contemporary API's of that platform. Some distinctive kinds of Native Apps consist of calendar, calculator Etc. While Web-primarily based totally Apps aren't actual applications, rather those are websites which are designed to have appearance and experience as Native App. These require a browser in addition to Data Connection to run. Users first get entry to them through Web page and in that Web page they've the choice of putting in them on their tool. Hybrid Apps are partially Native App and partially Web App. These Apps stay on App save and take gain of tool functions. Many customers are interested in the use of Native Mobile Apps, as they may be used even if there's no Internet connectivity. First Android Mobile become T-Mobile G1, released in United States which incorporates pull down notification window proper from day one, having domestic display screen widgets containing Gmail, Google marketplace widget etc. According to a website, the variety of apps to be had on Google play save (For Android Platform) proper from Dec 2009(16000 apps) to February 2015(1,400, 000 apps) is depicted in following Fig. [2]. Various domain names of Android Applications consist of Entertainment, academic purposes, retail, financial, social, travel, education, healthcare etc.

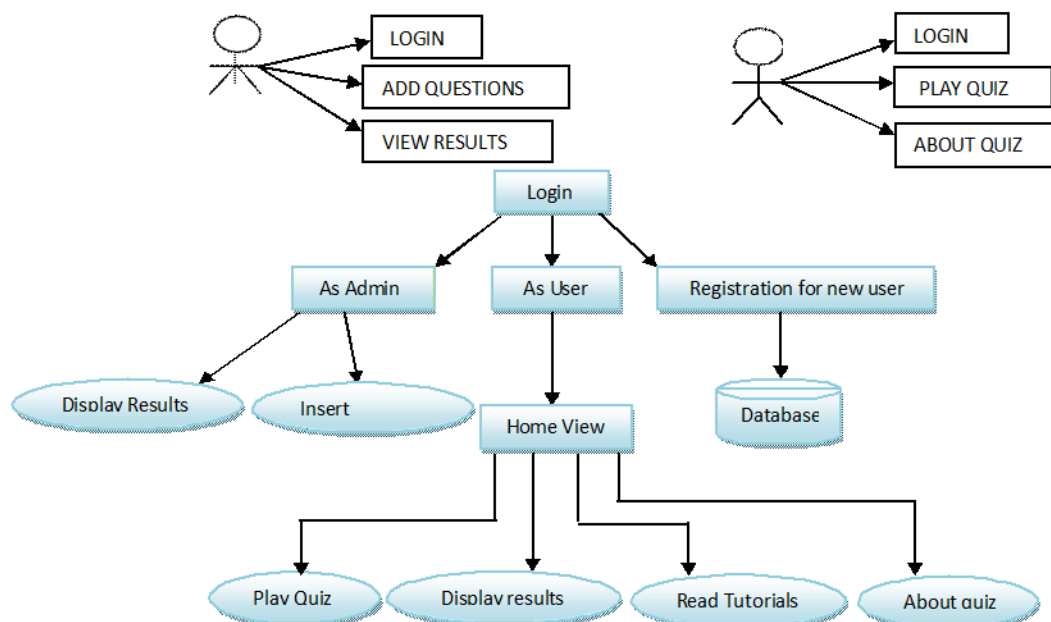


**RELATED WORK:-** Encouraged via way of means of release of inexpensive Smartphones, college students have commenced the use of Apps for instructional purposes. Many Apps are to be had which presents direction material, assignments for practice; textual content books Etc. for reading. Many Apps offer facility for dialogue via way of means of chatting rather than going to magnificence for fixing their problems. Also, college students can pick to show data in line with their choice. Different well-known apps for training encompass Chemistry Helper, English Helper, Kids numbers, Math Lite, Pathway, High School Physics and Vocab[3] etc. Many Apps are to be hard to assist the scholars to put together for aggressive Exams. Most Commonly used Apps encompass UGC NET [1], wherein there are modules for Syllabus of UGC-NET exam, Sample of Objective kind questions, reference books and downloading of preceding 12 months query papers etc. A comparable App named Indian History [5] is to be had wherein bankruptcy sensible tutorials are to be had for college kids to research. They can play the quiz and approximately 20 questions are requested with 4 alternatives for every query and scholar has to pick one alternative and quantity of accurate solutions may be proven on the end. One extra App named Gate 2015 [6], is to be had having modules for Syllabus, practice questions, preceding query papers, references of topics, suggestions Etc. The limitation is that there may be a desire to enclose all subjects in a hierarchical fashion. A comparable App named Net Prep+ [7], is to be had having modules i.e. timed take a look at, Random Test, Chapter Wise Test. Limitation is that the quantity of questions aren't sufficient for instruction. Keeping in view the

requirement of college students and non-availability of appropriate App, it's far exceedingly required to increase an App that facilitates the scholar to put together for aggressive assessments like UGC Net and GATE. Existing device to be had for instruction is to study via way of means of sitting at one location and there may be no facility to be had for instruction at the same time as they're on the move. The essential hassle is that maximum of the Apps deliver the handiest information about a way to put together, instead of supporting the scholars to put together. Numbers of Questions to be had also been limited. There isn't any provision to keep the outcomes of college students, in case, the Apps presents facility of tests. Also, the interface of the Existing Apps isn't interesting. The issue of the prevailing apps is that they're now no longer in line with the requirement of college students. The concept is to make a popular app having questions for all the topics in a hierarchical way and to encompass tutorials for all the ones topics to assist them research, after which they are able to take a look at themselves via way of means of giving the tests. So an App, quiz is designed and developed.

**3. DESIGN OF PROPOSED SYSTEM:-**The Proposed App goals to be User centric. After registration, a person can log in and might begin to take a look at upon choosing the subject. Each query may be given one minute. User has to reply to take a look at in the time and after submission, accurate solutions may be shown. If the person doesn't supply the solution inside particular time, then subsequent query will appear. Also, person can view his/her preceding effects, however administrator can view the effects of all the customers. Actual Users are the students, via way of means of logging in they are able to play quiz. The administration's job is to ask additional questions and keep the previous song in addition to the modern quiz effects. Figure below shows the use case diagrams for Admin and customers of the app.

**A diagrammatic View of the App:**



Technically, when a consumer starts developing the app, they can log in as administrator or a consumer, in case a consumer is already registered or he/she will be able to register. After registration, a username and password may be assigned to the consumer. If the consumer login as an administrator, the consumer can view the effects of all the different customers or can insert the questions into the database via way of means of deciding on a selected vicinity, after which via way of means of deciding on the concern associated with that If the consumer has login as easy consumer, then domestic view of the App may be visible. In the house view, there are 5 icons for specific purposes. By clicking the Quiz icon, he/she will be able to play the quiz, study the tutorials and show the effects etc. For every query, time of 1 minute may be given. User has to reply the query inside that time. If the consumer solutions the query, an accurate solution may be proven. User can study the academic for learning. User can view his/her very own preceding effects, however administrator can view the effects of all the customers.

**4. IMPLEMENTATION DETAILS:-**For implementation of the App quiz, the platform used is Android 4.2 and language used is Java and XML. SQLite is used on the backend. For putting surroundings of Android, there's a minimal requirement of JDK i.e. java need to be mounted at the system. JDK [8] SE improvement package 7 is used for this purpose. Code is written with the aid of using the use of an editor i.e. Eclipse that's an open source editor available [9]. After Eclipse (Juno, the default version)[9] is mounted, there's a want to attach Android SDK with Eclipse, which is obtained using the use of the ADT plugin [10]. By the use of ADT Plugin link, plugin developer equipment may be downloaded and mounted. SQLite is mechanically embedded into the Android device. Using SQLite on Android does not require any configuration to follow. Developer's best ought to outline SQL statements for growing and updating database in SQLite. If the App creates and makes use of a database, then the default vicinity of database is DATA/data/APP\_NAME/databases/FILENAME. Various modules of the app are as follows: **A. User login module:** In this module, a person has to first check in. User can be moved to register the hobby after clicking the register button on the login screen. User has to fill info like Username, Email-id, Mobile number, Password and Confirm Password Etc. Only registered person can play quiz with the aid of using logging in.

**B. Administration module:** if the person logs in as administrator, they can download new questions with the aid of using choosing a selected region and topics associated with that region or make any adjustments to database. Admin can show end result of all users, date wise or call smart because the case might also additionally be.

**C. Registration for brand spanking new User:** If the person desires to play quiz, first person need to check in with the aid of using filling info like User call, Email-id, Password, Confirm Password etc. After a hit Registration, a person can log in. After login, a person can play the quiz.

**D. Home view:** This module suggests icons for gambling quiz, About, Results, Exit. When the person clicks on the Quiz icon, the alternatives can be displayed, representing exceptional fields. When people decide a few unique concerns then random questions can be asked. Each Question can be given one minute. User has to reply the query inside that time. At remaining, end result can be displayed.

**E. Results view:** This module is used to show preceding in addition to present day rankings of users. By viewing the results, a person can degree overall performance in comparison to remaining attempts. The essential goal of this task become to check the expertise of person in numerous fields and additionally on the idea of score, college students can judge, wherein they

may be lacking. It presents assist in each discipline protected in quiz application. It presents tutorials to college students in an effort to study at the side of giving the tests.

## 5. RESULTS

Based on the non-public enjoyment of the growing quiz and available literature, the subsequent are the demanding situations confronted through the Android App developers:

**A. Multiple Devices:** The maximum not unusual place task is to set the homes of app for special gadgets with special display screen sizes, decision etc. There are many variations of every android tool and even as liberating the app, model particular information want to be checked, this makes the mission very critical. As it wants to be run in special gadgets, consequently it additionally impacts the price and finances implications. For every model of Android, developer has to put in writing code once more due to the fact there are migration trouble to be had emigrated the present code to new platform. Sometimes, conduct is likewise special throughout new platform.

**B. Testing the Android application:** Currently, the development environment does not have enough hardware to test. There is a want of trying out strategies for the Android Platform. Also, debugging capabilities ought to be made to be had.

**C. Limited Capabilities of Different Devices:** Sometimes special gadgets have special abilities in phrases of software program guide, like a few browsers has bad guide for HTML5.

**D. Emulators/Simulators Problem:** Emulators are the gadgets which presents us hardware surroundings of Android Devices, even as Simulators offer us the software program surroundings. Apps are examined at the emulators, which aren't sufficient for trying out. Emulators are very sluggish and take a variety of time to begin and run.

**E. Data Intensive Apps:** Since Mobile Devices have very restrained memory, so it's far very hard to shop large quantity of information in it. Offline caching doesn't paintings properly, and synchronizing with every other information supply is a difficult mission.

**F. Lack of software / hardware integration:** a button on the Android tool works differently on all other tools. So it's far hard to construct an app that is based on a selected hardware to do a thing.

**G. Security Issue:** Since Android is an open Source running device, so there may be malware Apps which customers can set up through mistake or through every other purpose that could cause lack of information.

## 6. CONCLUSION AND FUTURE SCOPE

Smartphones has changed the life of everyone. Along with extraordinary features, an App in Smartphones lets in do almost everything, from playing video games to do business. The development of app described in present paper has given robust records of various traumatic conditions associated with format and development of apps. To revel in has been quite challenging, motivating further to satisfying. Quiz App can be used by university college students successfully on the equal time as getting geared up for examination. More questions may be introduced every so often simply so App can cope up with requirements of users. Several modules like on name for MCQ's for a selected subject, Job Notification, Downloading of Tutorials, Downloading of Reference books etc. can be introduced in future for enhancement of features.

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<https://play.google.com/store/apps/details?id=com.hrithriddhi.indquiz&hl=en>

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## DIABETES TYPE-2 UNHEALTHY EATING HABITS

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**ABSTRACT:-**Diabetes is increasing tremendously in today's world, because of unhealthy eating habits of the people and has created a major issue in deteriorating human life. Due to excessive eating of fast foods and high level sugar contain a drink, which increases the glucose level in blood. It has been observed that young and adolescents people often fall prey to diabetes in recent years due to easy availability of fast food via swiggy or zomato, due to busy work schedules. Diabetes type -2 can be caused due to eating disorders and not necessarily inherited from family histories which lead to tremendous increase in Diabetes type -2 in common people. Diabetes type-2 is caused due to unhealthy lifestyle of the people. Obesity has caused a major disadvantage in people. Type -2 is usually common in mid -aged people, but due to obesity and inactiveness in people, young children have been seized down to diabetes illness. This study endeavors' to achieve an aspect of the unhealthy eating problem in Vasai -Palghar district population. Aim of this study is to create social awareness among the young and adolescent population about tremendous eating of junk food on daily bases that could lead to fat saturation and increase glucose level in blood and fall victim to diabetes. Primary data was collected by questionnaire above age 15 years in Vasai region only. The respondents received a total of 58. After data analysis it was found that, the population with the age group of 15 years to 45 years are more prone to eat oily, sugary and easy to make and eat junk fast food.

**KEY WORDS:** - DiabetesType-2, junk food, risk, adolescent, social awareness.

**INTRODUCTION:-**Diabetes Type -2 has increased in the younger generations and has increased rapidly due to high fat diets among the young adults and adolescents. Fast food contains many preservatives, fats and salts to keep them longer, but these types of food are loved by younger generations because they are easy to cook and easy to eat due to their busy lifestyle. People tend to eat high calorie food daily which is hazardous to health. The fats and glucose get saturated in blood which can in future lead to diabetes. The diabetes consists of two types are as follows: Type-1 and Type -2. Diabetes destroys the insulin beta cells in pancreas. Insulin helps hormones to move the glucose in the cells of the human body which helps to produce the energy. Insulin producing cells of the human body are knocked down and the insulin are hindered and glucose will not enter the human body. Type -2 diabetes is caused due to the lifestyle of the people who are obese and non -active. Middle-aged adults often have type -2 diabetes, but have increased in children because of obesity. To cure diabetes weight loss, eating healthy food well and exercise help to regulate the disease. In this study, the main aim is to have a social awareness among the people about the increasing chronic diseases due to unhealthy eating habits among adolescents. To study about bad eating habits a survey was conducted based on the questionnaire. There were 58 respondents from the vasai -palghar region who responded. The questionnaire was based on the outside habits, fatty food, oily food, sugar drinks and packed food etc. eating on never, daily and once a week and twice a week bases. It was found that the younger generations are more prone to eat unhealthy food which could lead to obesity and inactivity among younger adults and in future could have Diabetes. Food portions should be eaten proportionately by each and every individual to prevent from becoming obese. To make people aware about the percentage of people eating habits the survey was conducted to make



people aware about the disease and prevent falling prey to the disease and stay healthy by eating healthy nutritious home-cooked food.

**REVIEW OF LITERATURE** :-Disordered eating behaviors in type 1 diabetic patients (Larrañaga A, Docet M, García -Mayor R *World Journal of Diabet es (2011) 2(11) 189*). In this article the author highlights about the disordered eating habits of the people and mostly disease cause to adults and adolescents. The BMI of humans play a major factor and people with poor metabolic rate are considered to be given diabetes treatment initially. Eating disorders should follow diabetes treatment, nutritional treatment and psychological therapy. Type 2 diabetes mellitus prediction model based on data mining ( Wu H, Yang S ,Huang Z et al. *Informatics in Medicine Unlocked (2018) 10 100 -107*), According to the author in the journal, states that there is an increase of diabetes in recent times. The author is using data mining K -means algorithm techniques for predicting and refines the accuracy of the diabetes type -2. The data from Pima Indians Diabetes Dataset and the Waikato Environment for Knowledge Analysis toolkit were used for the results comparison. From the results both comparisons have shown good results accuracy of about 3.04%, so the conclusion according to the author is the algorithm can be used for the prediction. Comorbid Diabetes and Eating Disorders in Adult Patients: Assessment and Considerations for Treatment (2012) 38(4) 537 -542), the author states that the people with diabetes mellitus(DM) and comorbid eating disorders (ED), the comorbid diagnosis (ED-DM) is in a poor state which had created undiagnosed of eating behavior in people and should be routinely checked. The eating problems should be done and medication can be prescribed for an individual. Disordered eating behaviors in youth with type 1 diabetes (ISSN 01457217 year 2015) according to the author in this article the adolescents have many eating disorders and have caused behaviours of eating in people. People are feared to gain excessive weight and consciously gain diseases. People are afraid of weight gain. Insulin deficiency is a chronic disease. Blood glucose should be balanced by eating healthy food like fruits and nuts and vitamins and also be active by doing regular exercise. Warning signs should be understood by the individual and proper assessment and opinions of the doctor to prevent high diabetes. Unwanted calories from the food eating outside with inappropriate proportions can lead to an increase in poor diabetes.

### **OBJECTIVES OF THE STUDY**

1. To understand the effect on the young and adolescent population incurs diabetes at an early age due to junk food.
2. To analyze the consumption of fast food and create social awareness among adolescents to have a healthy diet to avoid further risk of diabetes.
3. To suggest effective measures inclining towards an unhealthy lifestyle this results in various conditions like diabetes.

**LIMITATION OF THE STUDY** :-This study is scanty to the district of Vasai -Palghar in Maharashtra only. Therefore the findings of the research can't give broad scope to other regions. The research was only based upon unhealthy eating habits. Furthermore studies can be done based on the physical activities and BMI, family history of diabetes to predict the population falling prey to diabetes. The study can be made broad by data mining using different techniques.

### **RESEARCH METHODOLOGY**

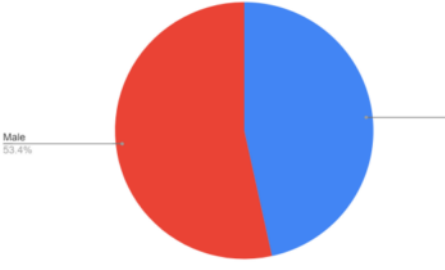
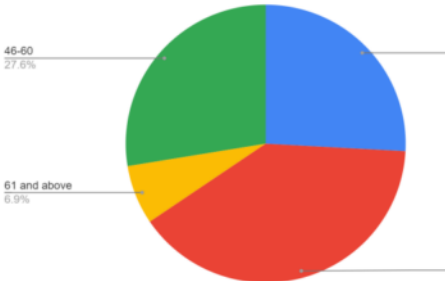
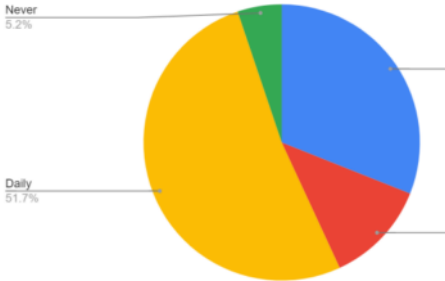
#### **Data collection method:**

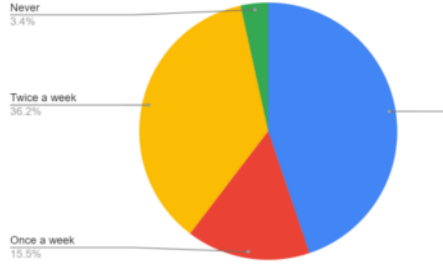
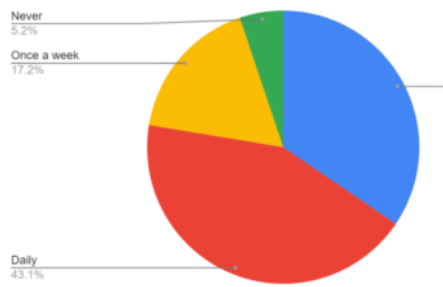
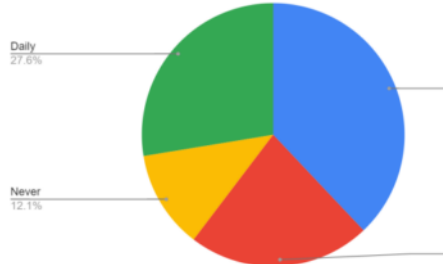
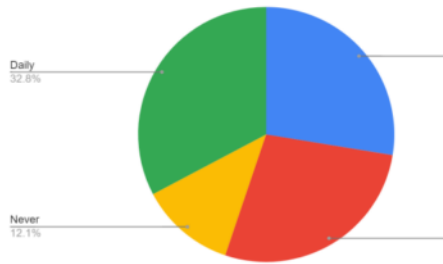
**Primary data:** Primary data is collected through questionnaires, which was circulated amongst the common people aged above 15 years in Vasai region only. Total of 58 people responded to the questionnaire and the data collected was then analyzed. People from Vasai participated and

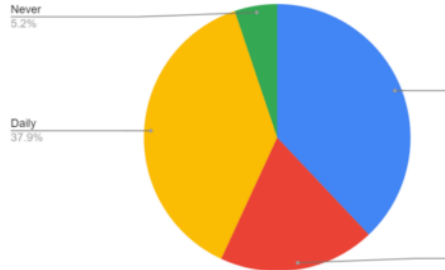
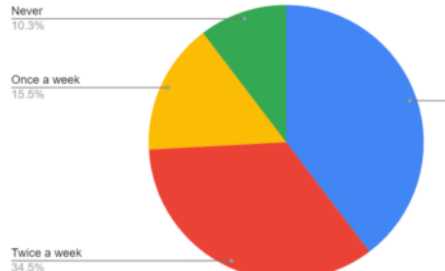
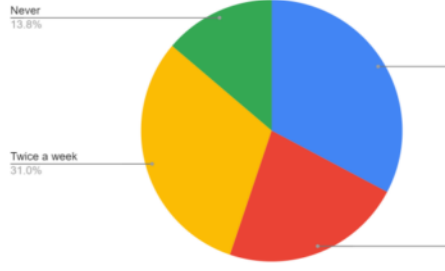
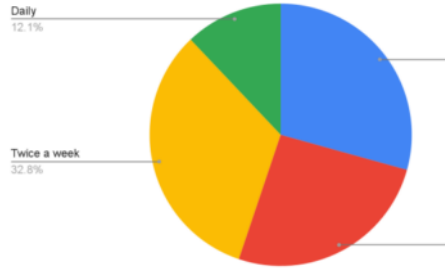
gave their insights by filling in the ways of eating habits in day -to-day life. The sample size for the same is of 58 respondents from the area of Vasai-Palghar district only.


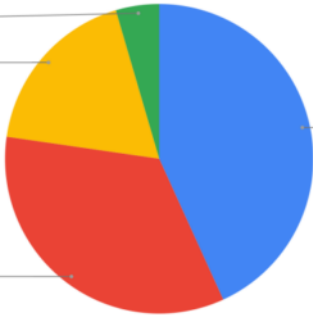
**DATA ANALYSIS & INTERPRETATION**

**Survey of data collected through questionnaire:**

<p>1.</p>	<p>Count of Sex:</p>  <p>Male 53.4%</p> <p>Female 46.6%</p> <p><b>Figure 1.1 Count of Male and Female</b></p>	<p>In the fig 1.1 states that out of 58 respondents 53.4% are Male and 46.6% are Female respondents. This also suggests that one of the genders is often a victim of diabetes. This is represented by unhealthy eating habits in people. Also the lifestyle of the population has changed drastically over the past few years leading to obvious changes.</p>
<p>2.</p>	<p>Count of Age:</p>  <p>15-30 39.7%</p> <p>31-45 25.9%</p> <p>46-60 27.6%</p> <p>61 and above 6.9%</p> <p><b>Figure 1.2 Age Group</b></p>	<p>In the questionnaire the Age groups were divided into four categories and they are as follows: 15-30 years, 31-45 years, 46-60 years and 61 and above. Fig 1.2 states that, 25.9% respondents with age group 15-30 years, 39.7% respondents with age group 31-45 years, 27.6% respondents with age group 46-60 years and 6.9% respondents with age group 61 and above.</p>
<p>3.</p>	<p>Count of How often did you eat 'fast food' from a takeaway restaurant? Think about foods like burgers, fish and chips.</p>  <p>Never 5.2%</p> <p>Daily 51.7%</p> <p><b>Figure 1.3 Eating fast food from Takeaway</b></p>	<p>Fig 1.3 states that 51.7% of respondents eat Daily fast food from a takeaway or restaurants followed by 31% respondents eat Twice a week. Food ordered from the restaurant contains sodium and artificial food colors which are bad to health. The Food contains a lot of calories and sweeteners which makes people obese and lack vitamins in food due to over-cooking, if consumed daily will be harmful.</p>

<p>4.</p>	<p>Count of How often do you eat savoury foods like crisps, chips, corn puffs, salted nuts or potato chips?</p>  <p>Never 3.4%</p> <p>Twice a week 36.2%</p> <p>Once a week 15.5%</p> <p><b>Figure 1.4 Savoury Foods</b></p>	<p>Fig 1.4 shows that consumption of savoury food like crisps, salted nuts, puffs and oily potato chips etc. daily is 44.8% and followed by 36.2% twice a week. Savoury foods have become common among people who contain fats which are bad for health and eating daily which is readily available in the market which can be destructive for health.</p>
<p>5.</p>	<p>Count of How often do you consume sugary drinks? Which include non-diet fizzy drinks, energy drinks, fruit juices</p>  <p>Never 5.2%</p> <p>Once a week 17.2%</p> <p>Daily 43.1%</p> <p><b>Figure 1.5 Sugary Drinks</b></p>	<p>Figure 1.5 shows that the 43.1% respondents daily consume sugary drinks like fizzy drinks, energy drinks, tea, coffee and sugar flavored syrups followed by 34.5% respondents Twice a week. Sugary drinks contain carbon dioxide, artificial flavors and Colorings and chemical preservatives which are bad for health.</p>
<p>6.</p>	<p>Count of How often do you eat sugary foods? Which include cakes/pastries, donuts, chocolates, sweet cookies, puddings</p>  <p>Daily 27.6%</p> <p>Never 12.1%</p> <p><b>Figure 1.6 Sugary Foods</b></p>	<p>Figure 1.6 states that 27.6% respondents eat sugary foods Daily which includes cakes/pastries, chocolates, sweet cookies, donuts and pudding etc. followed by 37.9% respondents eat twice a week. These Sugary foods contain preservatives and colors which are harmful for people's health.</p>
<p>7.</p>	<p>Count of How often did you eat a savoury pastry? food like pies, pasties, samosas, sausage rolls, pin wheels or croissants</p>  <p>Daily 32.8%</p> <p>Never 12.1%</p> <p><b>Figure 1.7 Savoury Pastry</b></p>	<p>Figure 1.7 states that savoury pastry like samosas, sausage rolls, croissants and pies etc. are consumed daily by 32.8% respondents and 27.6% Twice a week followed by 27.6% once a week. The consumption of oily and fatty food has caused problems in young adults.</p>

<p>8.</p>	<p>Count of How often do you eat deep fried food? like wada, samosa, kfc, pakkoda.</p>  <p>Never 5.2%</p> <p>Daily 37.9%</p> <p>Twice a week 34.5%</p> <p>Once a week 15.5%</p> <p><b>Figure 1.8 Deep Fried Food</b></p>	<p>Fig 1.8 states that respondents are eating deep fried foods like wada, samosa, kfc chicken and pakoda which are unhealthy to eat daily which contains a lot of fats and reusing of oil for deep frying. About 37.9 % respondents consume deep fried food daily followed by 37.9% respondents twice a week.</p>
<p>9.</p>	<p>Count of How often did you eat processed meat? which includes foods like bacon, ham, hot dogs, sausages, s...</p>  <p>Never 10.3%</p> <p>Once a week 15.5%</p> <p>Twice a week 34.5%</p> <p>Daily 39.7%</p> <p><b>Figure 1.9 Processed Meat</b></p>	<p>Fig 1.9 states that the consumption of processed meat has increased due to the unhealthy lifestyle of the people and which is quick and easy to cook and eat. In the study it has found that respondents consuming daily processed meat are 39.7%, followed by 34.5% Twice a week.</p>
<p>10.</p>	<p>Count of How often do you eat spreads? like cheese, peanut-butter, jam, mayonnaise, margarine, mustard or k...</p>  <p>Never 13.8%</p> <p>Twice a week 31.0%</p> <p>Daily 32.8%</p> <p>Once a week 12.1%</p> <p><b>Figure 1.10 Spreads</b></p>	<p>Fig 1.10 states that 32.8% and 31% respondents eat spreads like cheese, peanut-butter, margarine and mayonnaise daily and twice a week respectively. These spreads contain high amounts of sugar and trans fat. It contains a lot of artificial preservatives and flavors which can cause health issues.</p>
<p>11.</p>	<p>Count of How often do you drink alcohol? like beer, wine, whisky etc.</p>  <p>Daily 12.1%</p> <p>Twice a week 32.8%</p> <p>Never 13.8%</p> <p>Once a week 12.1%</p> <p><b>Figure 1.11 Drinking Alcohol</b></p>	<p>Fig 1.11 states that 32.8% have alcohol Twice a week. Drinking Alcohol has serious health effects if consumed regularly can lead to escalated fat inside liver cells. Alcohol is inculcated by the liver and its misuse can create cirrhosis and can have serious effects on health.</p>

12.	<p>Count of How often do you eat home-cooked food?</p>  <p>Twice a week 53.4%</p> <p><b>Figure 1.12 Home-cooked Food</b></p>	<p>Fig 1.12 states that 53.4% respondents eat home-cooked food only twice a week. It states that due to busy work life and eating habits, people are more prone to eat restaurant easy to make and ready-made fast food which is high in fat and contains calories in larger amounts which can be hazardous to health.</p>
13.	 <p>Age above 61 4.5%</p> <p>Age 46-60 18.2%</p> <p>Age 31-45 34.1%</p> <p><b>Figure 1.13 Age wise Unhealthy Eating by respondents</b></p>	<p>Fig 1.13 states that Unhealthy eating habits of the respondents as per their age concludes that the 15-30 age group with 43.2% feast on unhealthy food followed by 34.1% with age group 31-45 years which has a tremendous impact on younger generations.</p>

**SUGGESTIONS AND RECOMMENDATIONS:-**Diabetes data collected by questionnaire are only based on the vasai area with only 58 respondents. More respondents will be collected in future by covering the Palghar region and to find out more people eating habits and doing data mining based on their age types and finding out the younger adults falling prey to diabetes and to help create social awareness. More findings will be collected based on their level of activity and style of working which could lead to obesity and unhealthy lifestyle and obesity could lead to diabetes in future.

**CONCLUSION:-**Diabetes has created major health issues now a-days to the young and adolescent population due to unhealthy eating behaviours like packed and canned food. People tend to eat outside food from the restaurants and packed food which is easy to cook and eat. The packed food contains artificial preservatives and Trans fat which is inadequate for health and can lead to early diagnosis of Diabetes. Fig 1.13 shows that about 15-30 and 31-45 age groups eat 43.2% and 34.1% respectively which is very high that could lead to health issues and fall ill to diabetes. Fig 1.12 states that 53.4% respondents eat home cooked food only twice a week that proves people have unhealthy eating habits. This is a conclusion from Fig 1.13 that younger children are eating more and an inadequate amount of nutritious and disorder eating food. Younger children should take care about their eating habits which can make them obese and high in calories and saturation of glucose in the blood which could be dangerous for the younger generations falling ill at early age like diseases like diabetes. As diabetes does not only target the mid aged people, but due to this find of non-nutritious food and bad lifestyle and eating disorders has caused many side effects on younger generation children and in future there can be tremendous increase in diabetes of younger age. So, according to the study early prevention among young generations should be done by eating healthy and exercising and to create social awareness between the young adolescents to stay in good physical conditions.

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## A Case Study on Awareness and Implementation of Tracking

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**Abstract:** In this age of significant telecommunications competition, mobile network operators constantly look for new and innovative ways to make changes and increase profits. One of the best ways to achieve this is through the delivery of highly personalized services. Location-based is the most powerful way to personalize mobile services. Location information is important to have location information in order to provide location-based services (LBS) to the user commonly useful for coverage, deployment, routing, location service, and target tracking rescue operations. Positioning is one of the most obvious technologies behind LBS. The most widely accepted system is the Global Positioning System (GPS). I do not know subscription fee or setup rates for using GPS. This document provides details about the design it sends users the execution of a Java application that assigns the current location. Location shared with friends and family using SMS (short message service) location and view them on maps. Users can avail this app even in case of emergency circumstances with the emergency feature of this application. To get location coordinates, the application uses GPS (Global Positioning System) as the location provider. The design has five parts: a mobile client, a web server, a database, a GPS system, and a map service. Finds a mobile client application that includes a mobile and a GPS receiver his position to know the user's position. This location is for mobile sharing the client sends this location to a web server that other users can access must have user-provided authentication. The mobile client is implemented using J2ME. It is one of the most promising software platforms for mobile devices. Representatives of the Sun. It is estimated that 18 to 20 million mobile phones will support the J2ME platform. Analysts predict that over the next few years, this technology will become ubiquitous. Web server side programming is done using PHP and the database is maintained by MYSQL.

**Keywords:** GPS, LBS, J2ME, 3G, Google maps, PHP, mysql, GSM

**Introduction:** Location Based Service (LBS) is considered to be the most profitable component of wireless value-added services. However, this is essential for the development of LBS data to be transmitted is strictly limited due to the limited bandwidth of the wireless network. With the advent of 3G, wireless network speeds have greatly improved, and it will provide more information to users easily, so LBS will be highly promoted. Today mobile communication devices are becoming more technological offers more advanced and more features than conversation. On cell phones, the Global Positioning System (GPS) tracking and sharing are some improvements. GPS-These systems can be used outdoors for activities such as hiking or camping. According to a new report from the research firm Berg Insight; "Income from mobile location-based services (LBS) in the European market increase by 34% per year 2622 million in 2010" [1]. It shows how important space is. Services (LBS) applications for mobile users are changing. For the past few years, mobile phones spread like wildfire. More than 2 billion phones worldwide and more. The mobile and mobile phone industry is growing faster than fixed line subscribers the world. Development is progressing from useless simple phones to smaller all-rounders high Resolution Color Display, Organizer, Integrated Camera, Global Positioning Service (GPS) receiver [2]. Features and services are the main reason for the rapid growth of the mobile business. A mobile phone can now give a day. It was only available on previous generation phones ability to communicate between multiple users and send text messages to fewer people number of inbuilt hardware. But now a mobile phone has the ability to

take pictures and take videos recording, Bluetooth, File Sharing, Touch screen display, Low power consumption, GPS receivers for accessing location coordinates and many other advanced features and built-in hardware. These eye-catching features attract more users. Here we are only paying attention internal GPS receivers for mobile phones [3]. The GPS receiver can calculate location where the GPS satellite system is used [4]. For more information and access authentication[5] refers to GPS. Location based services are attracting more and more users. Benefits of these services.

A location-based service basically answers three questions: Where am I? What's around me? Then how do I get there? They determine the place the user uses one of several positioning techniques (such as GPS), and then use location and other information to provide personalized applications and services. For as an example, consider a wireless 911 emergency service that locates the caller. For automatic. Such a service would be very useful, especially for remote users home and local landmarks are unknown. Navigation assistance including traffic advice and maps directions and Roadside Assistance are natural location based services. Other services can sync current location with information about personal preferences to help users find food, accommodation and entertainment suitable for their tastes and pocket books. This app lets users know their own location and send it to any valid location mobile number used for short message service. Users can also share their location with friends and family. Additionally, users can take advantage of emergency features sent to users from current location to emergency numbers. Due to the rapid growth of JAVA activation we want to implement this application in the market using handholds, J2ME and PHPMySQL. We use J2ME for the mobile client and we use PHP on the server side

MySQL. Our main goal is to show the implementation of such a system the paper is arranged as follows. Section 2 provides an overview of related work, while Section 3 is about related technologies. Section 4 shows the mathematics of location estimation. Section 5. This system is related to architecture. Section 6 provides a brief overview of its implementation. Section 7 gives the results and finally in section 8, we complete the whole project.

**Related work :-** This section handles some of the existing work related to the specific mobile. The solution is, essentially, tracking systems via GPS or GSM cell. In the paper [21], we discussed the detailed design specifications of this system and dealt with them in the paper [20] with detailed implementation of this system. In the paper [22], the author suggests an application to find friends and family. Mobile phones with Global Positioning System (GPS) based on client-server architecture helps users locate their family members and receive alerts when their friends are nearby. The mobile application was implemented using J2ME with the latest APIs and more. Older APIs have been integrated to make all types of applications more reliable mobiles. The server was executed using PHP because PHP guarantees that the server will run do not overload. MySQL was the type of database used on the system. In paper [17], a technology is provided to send the GPS coordinates of a mobile phone via SMS. Other mobile phones. There can be two algorithms, the Kalman filter and the Velocity Renewal used in conjunction with GPS, it is used as a basis for location tracking. First coordinates generated from a GPS enabled mobile on Google Maps, this location will be sent later SMS to someone else. The exact location of the sender for the second can be seen on his map with an accuracy of 0.57 m. The paper [18] describes two technologies for locating and tracking cellular phones. Digital cellular mobile telephony networks. The first technology is based on arrival time methods with at least three base stations (TOA) are required, but the latter angle is used Arrival (AOA) methods,

which require only two base stations, although more accurate. It is possible with three. TOA and AOA methods were tested for a multipath fodder Environment. There are already many applications on the market that offer tracking systems and anti-theft applications. Anti-theft apps like mGuard. Tracking applications like mobile tracking System 1.14 [23], AccuTracking [24], PhoneBak (also an anti-theft application)[25], is already well established in the mobile phone market. As seen in the systems mentioned above, most of them are dedicated solutions using tracking methods to monitor a mobile device. Our suggestion is a standard mobile phone with a GPS. Unlike the systems mentioned above, important. The feature of our application gives the user the ability to find him and send him through his own location SMS and share his location with friends via a web server.

**Related Technology:** -We have collected suggestions for approach to building the described system categories provided. The proposed solution can provide better performance, and it is much better easy to deploy on a standard mobile phone with a GPS receiver. For user security, the GPS Locator app can be useful in emergencies, for example kidnapping and hijacking, giving the user the option to send his location calls SMS.

**3.1 GPS :-**The Global Positioning System (GPS) [6] is a satellite-based navigation system. A network of 24 satellites launched into orbit by the U.S. Department of Defense. GPS was originally intended for military applications, but was introduced by the government in the 1980s. The system was made available for civilian use. GPS works in any weather, around the world, 24 hours a day. There are no subscription fees or set fees to use GPS. The GPS system has three parts.

3.1.1 Satellites: GPS satellites orbit the Earth twice a day in very precise orbits. Transmit signal information to ground.

3.1.2 Receivers: GPS receivers take this information and use a triangle (method) Estimate the exact location of the user.

3.1.3 Software: Application software is used to command devices such as handholds. Take advantage of computers and both of the above services.

**3.2 GPS satellite system :-**There are 24 satellites orbiting the earth which belong to the GPS space category 12,000 miles above us. They are moving continuously, less than two complete orbits more than 24 hours. These satellites travel at a speed of about 7,000 miles per hour. GPS satellites are powered by solar energy. They have backup batteries when solar eclipses occur, run them when there is no solar energy. Small rocket boosters on each satellite fly them in the right direction. Here are some other interesting facts about GPS satellites (also known as Navstar, the official U.S.

**Name of the Department of Defense for GPS:**

The first GPS satellite was launched in 1978. Achieved a complete galaxy of 24 moons in 1994. Each satellite is built to last about 10 years. Replacements are ongoing built and launched into orbit. A GPS satellite weighs about 2,000 pounds and is 17 feet wide solar panels stretched. Transmitter power is 50 watts or less.

**3.3 Applications :-**Although actually a military project, GPS is considered a dual-use technology. That means it has significant military and civilian applications. GPS has become widespread useful and useful tool for commercial, scientific applications, tracking and monitoring. GPS facilitates daily activities like timely banking and mobile phone activities. Even the control of power grids. Farmers, surveyors, geologists and countless others perform their work more efficiently, safely, financially and accurately. The mobile application targets the Java platform. We decided to expand application using JAVA 2.0 micro version. This includes large

programming libraries and solutions for common problems. We are developing this application under CLDC 1.1 [6] device configuration

And the MIDP 2.0 [7] device profile. Software selected for the development of this application. The Java (TM) ME platform is SD K 3.0. The SDK is free, so anyone can develop it on their own. Applications, market it. We use the Mysql database and the PHP language to host the database on the server site. We use PHP because it works on the server side and reduces overhead back from the mobile tool. We used WAMP SERVER software that includes MYSQL and PHP for local hosting. Apache HTTP server in one package. This includes PHPMYADMIN. With help these are the things we do locally for our project. To show coordinate on the map, we use a third-party Google Maps API. It's a lot activities for managing Google Maps online

**4. Location Coordinate Estimation** :-In a very simple approach, each satellite sends signals content is as follows: I am Satellite X, my location is Y, this is where the information was sent time Z. In addition to its own location, each satellite sends data about its location other moons. This orbital data (ephemeris und Almanac data) is stored by GPS receiver for subsequent calculations. To determine its location on the ground, the GPS receiver compares the time the satellite sent the signal along with the time the signal was received. From this time on the difference between the receiver and the satellite can be calculated.

If data from other satellites are taken into account, the current position can be calculated trilateration (meaning determining the distance from three points). This means at least three satellites are needed to determine the location of the GPS receiver on Earth's surface. The calculation of a position from 3 satellite signals is called 2D -position fix (2D positioning). It is two-dimensional because it has to be received suppose it is located on the surface of the earth (one plane is two -dimensional). By means of an absolute position of four or more moons in a three-dimensional space can be determined. A 3D -position fix also results in a height above the Earth's surface. Simplified, the positioning via a GPS works on the simple principle divide the distance by lightning: Measures the time between lightning and thunder below. Delay between time due to very high speed of light the flash falls to the ground and the observer can ignore the time he sees the flash. The speed of the noise in the Earth's atmosphere is about 340 m / s. This means that for example the difference of 3 seconds between thunder and lightning is about 1 km distance to lightning. However, this procedure is not yet a determination of a position, but only a determination. A distance. If different individuals are in certain positions, a time limit will be set between them. Lightning and thunderstorms will allow you to determine the location of the flash land. The following is an explanation of how GPS positioning works. For simplification, in the first step we assume that the earth is a two -dimensional disk. This allows us to make some understandable sketches for illustration. The principle can then be transformed into a three -dimensional globe model. In the example on the left, the time required for a signal to travel from the first of the two .Satellites to receiver 4s. (Actually this value is very high signals travel at the speed of light (299 792 458, 0 m / s), the real time range of signals 0.07 seconds from satellite to receiver.) Based on this information, we can state that the receiver is located somewhere in the A. A 4-second circle (left circle) around the first satellite. If we do the same procedure with the second satellite (right circle), we get two points Intersection. The receiver must be located at one of two points. Now we have used two satellites but this process is called triplication, not dilatation, so we do not need a third the moon? We may use a third satellite, but we can assume that the receiver is located. Somewhere close to the Earth's surface is not deep in space, so we can ignore point B know where to find the receiver point A. The area in the image above is shaded Gray is the area where GPS signals should be "realistic". Locations outside of this the area

is abandoned, and so is point B. If the third satellite is taken into account for the calculation of the position, the other intersection point is obtained: If all the clocks are perfectly accurate, point A will be received according to the actual location of the receiver. If the receiver clock is 0.5 seconds earlier, three intersection points B are obtained. In this case the clock error is immediately noticeable. If now is the time of the receiver clock the three intersection points were changed until they merged into BA, and the clock error was corrected. The receiver clock is synchronized with the atomic clocks on the satellites. The GPS receiver can now be considered as an atomic clock. Distances up to the moons, which were previously considered pseudo-ranges, are now matched to real distances the fixed position is accurate. In practice you will get a two-dimensional positioning (2D-fix) with three satellites. Position is bound to be located on the surface of the earth. Is the fourth satellite Geocentric; the distance to the "fourth satellite" is 6360 km. (Globe). Also provided is the fourth satellite required for the calculation, but the calculation restricted to terrestrial locations. However, the earth is not a perfect sphere. In this case, the surface of the earth means the geoid, which is the surface of the earth. If the receiver is located on a mountain, the specified location is again affected by one the runtime of satellite signals is inaccurate.

**5. System Architecture :-** The current location of the user is calculated using the phone's inbuilt GPS receiver. The user's calculated coordinates are shown on the map by a third party GoogleMaps API called MIDMAPS. Additionally these coordinates can be sent to any valid mobileNumber via an SMS. This is because the user cannot edit the text messageSecurity reasons. The application architecture and its working principle are focused on the use of GPS. That's it the most common technology for these types of applications. There may be other possible approaches include a combination of GSM cell ID, wireless hotspots, or other LBs via Bluetooth. Cross data from all LBs should provide a more accurate location of the device. Also, unlike GPS, it has GSM cell ID, wireless hotspots and Bluetooth tracking. The location of the device can be achieved even inside the house. Centralized database server users can coordinate database so they can get the location of friends and relatives Updating its own position on the server. Purpose of choosing centralized data sharing to reduce the storage overhead on each phone. Or, instead of using it centrally database each mobile phone can store and share its own database on the phone databases between different users. The Internet is a medium used to transmit user data and service requests the requested information will then be returned to the mobile server. The top 5 components that make up a system are the GPS system, mobile clients, and Web server and database.

**5.1 Mobile Clients (Mobile) :-** Mobile frequently requests its location from the Global Positioning System it sends it to the server over the communication network. The user can request the location of a family member at any time from the server. It can also be sent to the mobile customer current location via SMS to any mobile number. The mobile client also has an internal database for storing application settings. The mobile client application is called GPSLocator.

**5.2 Server :-** The server accepts users' location and updates the user about the family location members.

**5.3 Database :-** The database contains all the users who have subscribed to the service with their location. The database stores the user's mobile number and the other user's mobile the number where the user shares his location. The database duplex has six main attributes i.e. R, R, latitude, longitude, height and time stored by the user's mobileNumber, the mobile number and latitude of the other user to which the user shares his location. User Position Coordinate, User Position



Longitudinal Coordinate, Height Coordinate, User location and when the user updates his location. Occasionally, user updates. His location time has also been updated.

**5.4 GPS :-**Each time the user position on the mobile phone server is updated, it is requested location of the user from the GPS receiver. The GPS receiver determines the longitude and latitude with the help of satellite system.

**5.5 Map service :-**The map service provides Google Maps and many more map management functions. What the user needs. However, the map service is an indirect part of this system Distributed through an external source. Then sent to the mobile phone. Data from Application Settings and Emergency Contacts is stored in a database file. When the application starts; The data is loaded from the file and will apply according to those parameters. The main requirement of the GPS locator shown is location based usage Services like GPS (LBs). GPS Locator allows users to perform a number of similar functions you can view these coordinates in addition to your own current position (latitude, longitude, altitude) MidMapsapi [15] is used for the J2ME platform on Google Maps. More users can send it information via SMS via a GSM / CDMA network to any valid mobile phone number anywhere in the world. It also provides location sharing capability between GPS locators two or more people through one web server. If a user wants to share his location with one of his friends. All you have to do is select Share Friend and enter his friend's mobile phone number Option from the list, press the OK button. To see friends, the user has to choose what to get friends location option from the GPS locator list menu. Suppose there is a user A and a user B sharing their location. Hence, the time at which A and B can see each other's location the user has updated his location and can see this location on the map. GPS locator continuously updates the web server database with the user's current location using ENABLE sharing command. After this, the GPS locator calculates the current location of the user

It sends to the server and updates the associated user's location attributes database list. To reduce battery overhead due to GPS receiver, this allows the app's developers to update the database after a certain period of time instead of constantly counting GPS data. The user can also cancel the sharing bond with any friend whose user shares his location.

**6. Implementation :-**Implementing this application is not fully implemented activity mentioned in previous topics. It was its perfect application this is not strictly possible within the time frame of the project. Instead, implementation the only proof of the idea of purpose is to show that it is possible Run the entire system. The mobile application was implemented using J2ME while using PHP implements server functions and uses MYSQL for database. Implementation this task can be easily understood by dividing it into several stages. We will see first let's take a look at the implementation of mobile clients and then how the web server and database work we are integrating the external map service with our application.

**Mobile Client Side Implementation :-**The mobile client is a Java supported hand held provided by a GPS receiver Lots of features for the user. The mobile client programming language and IDE is Java and JAVA ME Platform SDK 3.0. The Java ME platform is a collection of technologies features that can be integrated to create a complete Java runtime the Java ME platform is divided into two basic configurations, one suitable for small mobile devices and the other for targeting environment specific needs. More capable mobile devices such as smartphones and set top boxes. Configuration targeting resource-intensive devices such as mobile phones is called connected. Limited device configuration (CLDC) [6]. It is specially designed to meet the needs for Java platform to work on devices with limited memory and processing power graphical skills. For a CLDC, MIDP [7] environment, this is what it usually is implemented on most



mobile devices today, a MIDlet is created later. Is a middlelet .An application created by a Java ME software developer, such as a game or business app or other mobile features. Let' s write and run these MIDlets once all available devices are compatible with the features of Java ME technology. The various functional implementations of the mobile client are as follows. Mobile the class diagram of the client application is represented b y the corresponding UML class this is based on the Fujaba Tool Suite RE 4.2.0 [26].

## **7. Evaluation and evaluation**

7.1 User experience and application interface this subsection presents a general concept of the mobile application (GPS locator) as well as its use in practical deployment. To facilitate user interaction with GPS the locator and interface are kept as simple as possible. 'S main window The application is very intuitive.The interface displays a list of functions that a GPS locator can perform eye, Get Friends Location, Emergency etc. The left soft key allows the user to terminate Enables application and right soft key Enables sharing mode.

## **7.2 Application Evaluation**

The purpose of the evaluation is to show that the implemented system satisfies the i nitial requirements. The GPS locator (and MIDMAPS) were evaluated using comprehensive running tests performed during design to collect debug.Information and change as needed. We used an original device with all the tests, NOKIA 5235 equipped with SIM card and GPS receiver.

**8. System result :-**This mobile application system adopts Nokia 5235 as a test mobile inbuilt GPS receiver. It shows the current location and map of the user this location is located in the center of the mobile screen. Users can also browse the map. The map can be zoomed in / out. When zoomed in, the map automatically switches to it next level maps. The user must enter the correct one password to access his friends' location. It is marked with a red pointer.

**9. Conclusion :-**Using a Location Based Service (LBS) application for Java enabled mobile phones global Positioning System (GPS) is presented in this paper as a location provider.The application assigns the user his current location coordinates and displays it on Google Maps on mobile phone. The application is also implemented as a client a server system that helps users find their friends or anyone they want share his position. Location using this system is believed to be average accuracy

Within two meters. The application only works in op en spaces rely on GPS. Future extensions may look for other options, such as getting location from the service provider. Location accuracy will also decrease in this case depending on the size of the cells where the user is located. There may be other extensions in the future summarized as follows:

- 1.Excellent user interface design;
- 2.External Bluetooth GPS receiver interface;
- 3.Accelerometer, proximity, compass;
- 4.Improved accuracy with new algorithms;
- 5.Emergency services using centralized databases

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## EFFECTIVENESS OF SKILL TRAINING PROGRAM ON CPR AMONG ADOLESCENTS IN SELECTED NURSING COLLEGES OF JAIPUR RAJASTHAN

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**ABSTRACT**-Basic life support is an emergency procedure which is performed in order to return life of a person who has come across cardiac arrest. Resuscitation measures can be the lifesaving procedure for children and adults who experience cardiac arrest or respiratory failure.

**KEY WORDS**-Adolescents, Skill Training Program, cardiopulmonary resuscitation, CPR

**INTRODUCTION**-CPR is an emergency procedure for a person who is in cardiac arrest which consists of chest compression often with artificial ventilation, performed to restore spontaneous blood circulation and breathing in an effort to maintain brain function until further measures are taken. International Liaison Committee on Resuscitation (2003) stated that CPR training should be included in the standard school curriculum. According to American Heart Association, heart diseases are regarded as number one global cause of death and it leads to 17.3 million deaths every year (Heart and Stroke Statistics, 2015).

Cardiopulmonary resuscitation (CPR) is an **emergency procedure consisting of chest compressions often combined with artificial ventilation** in an effort to manually preserve intact brain function until further measures are taken to restore spontaneous blood circulation and breathing in a person who is in cardiac arrest.

If they are aware and have the ability to perform basic life support during the critical life situation, then they can educate their younger ones. So, if the maximum people in the society know the basic life support, then we can save the life of those people who are suffering from sudden cardiac arrest or any other which requires basic life support immediately. Till now, no studies have been carried out in North-East region conducting the CPR training among the nonprofessional health workers. Moreover, the above data signifies that there is increased prevalence of cardiac arrest and accidents regardless of person and place, which demands special attention and the quality of care in turn to minimize mortality rate. Thus, the authors carried out this study on skill training program for adolescent students on cardiopulmonary resuscitation.

**MEDICAL USE**- CPR is indicated for any person unresponsive with no breathing or breathing only in occasional agonal gasps, as it is most likely that they are in cardiac arrest. If a person still has a pulse but is not breathing (respiratory arrest) artificial ventilations may be more appropriate, but, due to the difficulty people have in accurately assessing the presence or absence of a pulse, CPR guidelines recommend that lay persons should not be instructed to check the pulse, while giving healthcare professionals the option to check a pulse.

**Compressions with rescue breaths** :-A normal CPR procedure uses chest compressions and ventilations. The compressions push on the bone that is in the middle of the chest (sternum) and the ventilations are made pinching the victim's nose and blowing air mouth-to-mouth. If the victim is a baby, the rescuer would make the ventilations covering the baby's mouth and nose at the same time. It is recommended for all victims of any age a general compression-to-ventilation ratio of 30:2 (30 rhythmic compressions before each 2 ventilations).

As an exception for the normal compression-to-ventilation ratio of 30:2, if at least two trained rescuers are present, and the victim is a child, a ratio of 15:2 is preferred. And, according to the AHA 2015 Guidelines, the ratio in newborns is 30:2 if one rescuer is present and 15:2 if two rescuers are present. In an advanced airway treatment, such as an endotracheal tube or laryngeal mask airway, the artificial ventilation should occur without pauses in compressions, at a rate of 1 breath every 6 to 8 seconds (8–10 ventilations per minute).

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## **A STUDY TO ASSESS THE EFFECTIVENESS OF A TRAINING PROGRAMME ON BASIC LIFE SUPPORT AMONG NURSING STUDENTS IN SELECTED NURSING COLLEGES OF JAIPUR RAJASTHAN**

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**ABSTRACT-**The present study to assess the effectiveness of a training programme on basic life support among nursing students in selected nursing colleges of Jaipur Rajasthan. The main focus of this study to enhance the level of knowledge regarding basic life support among nursing students. The objective of this study to assess the knowledge regarding basic life support among nursing students, before develop a training programme on basic life support among nursing students, evaluate the effectiveness of training programme on basic life support after the training programme, find an association between knowledge score and with their selected demographic variables.

**KEY WORDS-** NURSING, STUDENTS

**INTRODUCTION-**CPR and BLS are critical life -saving, first-aid skills. CPR is an emergency procedure that is conducted in an effort to physically retain integrity of brain function until additional steps can be taken to restore spontaneous blood circulation and breathing in the individual who is experiencing the cardiac arrest. It entails applying pressure to the chest and using a machine to breathe for you. When a patient's airways are kept open and breathing and circulation are supported without any additional technology, it is known as basic life support (BLS). As a result, a thorough grasp of CPR is essential to enhancing patient outcomes.

Roughly 30 percent of deaths due to acute myocardial infarction occur during the first hour of the beginning and about two -thirds of deaths occur before the sufferer reaches the hospital. It was also mentioned that 80% of early fatalities are related to ventricular fibrillation which is curable. Other reasons of sudden death include drowning, suffocation, electrocution, drug overdose and unintentional injury. Many of these deaths can be averted if the victims obtain fast and effective treatment. Survival of cardiac arrest depends on a number of key interventions and this process is frequently called as chain of survival. When a life -saving intervention is put off, the patient's chances of survival go down. In deciding the better possibility of survival of the victims, everybody includes bystanders, first responders, emergency service employees, paramedics and physicians must be able to play their responsibilities effectively while dealing with emergency circumstances.<sup>8</sup> Sudden death is a significant public health issue since it is a leading cause of death around the globe. It is estimated that there are 2 lakh cases of sudden death with cardio-pulmonary arrest happening each year in Brazil and that half of them happens outside the hospital. Given the extent and significance of this disease, even minor incremental increases in survival can result into thousands of lives saved each year.

Preventing injury or sickness from worsening or progressing into complications and promoting a quicker recovery are the primary aims of emergency first aid. Similarly, in trauma situations, other than definitive and intensive care phase, a comprehensive treatment must also comprise pre-hospital as well as emergency and resuscitation phases. Pre-hospital care, emergency department services, definitive treatment, and rehabilitation and reintegration all need to be connected to these phases.

Death is more likely to occur after 10 minutes of deprivation of oxygen to the brain. From 6 to 10 minutes brain damage is likely. From 4 to 6 minutes brain injury is quite conceivable and from 0 to 4 minutes brain damage is nearly non-existent. When the heart stops beating blood stops circulating throughout the body. Chest compressions and breathing into a patient with no pulse or breathing are known as Cardiopulmonary Resuscitation (CPR). Chest compressions paired with breathing into the patient will move the now oxygenated blood throughout the body and into the brain. CPR functions like a mechanical heart pushing the blood rich in oxygen into the brain. After CPR and/or an AED have been administered, the odds of this patient surviving are improved, and this improvement persists if Emergency Medical Services (EMS) are sent within 10 minutes.

In India the basic nursing curriculum laid enough focus on Cardio Pulmonary Resuscitation method. In the case of Cardio Pulmonary Resuscitation, nursing students' educational experiences may be suspect. As a result, many Indian institutions lack even the most basic Cardio Pulmonary Resuscitation manikins, due to the lack of regulatory requirements mandating their use. In addition, only a small number of educators are trained in both Basic Life Support and Advanced Cardiac Life Support. This event has the potential to have a compounding effect on nursing students' CPR knowledge, attitude, and ability to do it.<sup>i</sup>

CPR should be taught to every nurse and physician because cardiac arrest, the sudden cessation of breathing and blood flow by the heart, may occur at any time or in any scenario. A resuscitation plan may be broken down into two parts like BCLS and ACLS. The American Heart Association sets the guidelines for CPR and is actively engaged in teaching BCLS and ACLS to health personnel. The American Heart Association advises that all healthcare providers, including nurses and doctors, obtain BCLS and ACLS certification before working with patients. In most cases of cardiac arrest, CPR is ineffective in reviving the victim. It is an essential link in the chain of survival that supports the sufferer until more sophisticated aid is available. Early activation of the EMS system, early CPR, early defibrillation, and early advanced care make up the survival chain.<sup>ii</sup>

Recommending that chest compressions be the initial step for lay and professional rescuers to resuscitate victims of sudden cardiac arrest, the organisation stated the A-B-Cs (Airway - Breathing-Compressions) of CPR should now be altered to C-A-B (Compressions -Airway-Breathing) (Compressions -Airway-Breathing). For more than 40 years, CPR instruction has stressed the ABCs of CPR, which teach rescuers to tilt their heads back, squeeze their nose, and breathe into the victim's mouth before doing chest compressions to open the victim's airway and save their life. This strategy was creating considerable delays in commencing chest compressions, which are critical for maintaining oxygen-rich blood moving through the body. Changing the sequence from A-B-C to C-A-B for adults and children allows all responders to begin chest compressions immediately away.<sup>iii</sup>

Life rates for patients in cardiac arrest drop about 10% for every minute they are left without help, according to estimates. However, studies have shown that if cardiopulmonary resuscitation (CPR) is performed as soon as possible, it can increase a victim's odds of survival by 50% or more. So, it becomes inarguably vital that medical students must be thoroughly taught and expected to study current information on CPR methods in order to deliver a satisfying care. This is especially important as the suggestions are that basic training must be offered even for the lay populace who are the most probable bystander in these circumstances. In this endeavour the AHA teaches more than 12 million individuals in CPR yearly, including both the lay public and



health professionals. Therefore, medical schools must give appropriate opportunity for acquisition of this competency by its medical students American Heart Association (AHA). CPR (cardiopulmonary resuscitation) is a life -saving method that may be used in a variety of situations when someone's respiration or heart has stopped, such as a cardiac arrest or near drowning. CPR should be started with forceful and quick chest compressions, according to the American Heart Association. Both unskilled spectators and first responders may use this hands -only CPR technique.

If you're hesitant of doing CPR or aren't sure how to do it properly, remember that it's constantly better to attempt than to are doing nothing. The variance between doing what and doing nil might be the matter of life and death. The American Heart Association offers the following advice:

**Untrained:-** Provides hands -only (CPR if you aren't trainee in CPR or are concerned about administering rescue breaths. Until paramedics come, it means continuous compressions of chest of 120 per minute (described in further detail below. You don't have to attempt to save his life by breathing.

**Well-prepared and ready to drive.** Check for a pulse and respiration if you are assured in your abilities and well -trained. Start compressions of chest if there is not at all pulse or respiration after 10 seconds. CPR should begin with 30 compressions of chest followed by 2 rescue breaths.

**Experienced yet rusty.** If you've already gotten CPR instruction but aren't full confident in your skills, just do 100 chest compressions each minute children, Adults, and babies need CPR in the same settings as children, and adults, infants, but not newborns (infants near up to 4 weeks).

CPR is technique that keep oxygen rich blood flow to the other organs and brain until emergency therapeutic treatment can re -establish a regular heart beat. Once the heart stopovers, your body have dearth of oxygen-rich blood. The lack of blood that is rich in oxygen can reason brain injure in only a limited minutes.

#### **Before begin CPR**

Before beginning CPR, check:

- Is the person's surroundings safe?
- Is the individual active or comatose?
- If the individual looks to be unconscious, touch or shake her/his shoulder and inquire ask, "Are you OK?" loudly.
- If the individual doesn't react and you're with additional person who tin assist, call to local emergency number, and if one is accessible, grab the AED. Begin CPR with the help of the other individual.
- resident emergency call number before commencing CPR
- As soon by way of an AED is available, administer one shock per the device's instructions, then start CPR.

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## **IMPACT OF INTEGRATED TRAINING PROGRAMME ON BEHAVIOURAL OUTCOME REGARDING ANTENATAL ASSESSMENT OF MATERNAL AND FETAL WELL BEING AMONG MARRIED WOMEN FROM SELECTED AREAS OF NAVI MUMBAI.**

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**ABSTRACT-** The present study was undertaken to evaluate Impact of integrated training program on behavioural outcome regarding antenatal assessment of maternal and fetal wellbeing among married women from selected areas of Navi Mumbai . Main objective is to determine effectiveness of cognizance and perspective level regarding antenatal assessment of maternal and foetal well being among married women from selected areas Navi Mumbai after intervention programme.

**KEY WORDS-**Women, Fetal.

**INTRODUCTION-**The worldwide maternal mortality is unsuitably high. Despite fact that there was huge advancement in every single creating area, normal yearly rate decrease in worldwide maternal mortality proportion (MMR) was 3.1%, shy of thousand years Development Goals (MDGs) focus of 5.5%. Consistently, just about 800 ladies still kick bucket because of pregnancy or labor, and for each lady who kicks bucket at least 20 encounter genuine inconveniences. One of United Nation's MDGs is to lessen MMR by 75%.

The present study was undertaken to evaluate Impact of integrated training program on behavioural outcome regarding antenatal assessment of maternal and fetal wellbeing among married women from selected areas of Navi Mumbai . Main objective is to determine effectiveness of cognizance and perspective level regarding antenatal assessment of maternal and foetalwell being among married women from selected areas Navi Mumbai after intervention programme. It is achieved through following sub goal. First goal to assess existing cognizance level regarding antenatal assessment of maternal and fetal well being among married women from selected areas Navi Mumbai before intervention programmers. Second goal to assess existing perspective level regarding antenatal assessment of maternal and foetalwell is being among married women from selected areas Navi Mumbai before intervention programme. Then next goal to design and develop integrated training programme regarding antenatal assessment of maternal and foetalwell being among married women. Next goal to implement integrated training programme regarding antenatal assessment of maternal and foetalwell being among married women. Last goal to compare post test results with pretest results on behavioral outcome regarding antenatal assessment of maternal and foetalwell being among married women from selected areas Navi Mumbai.

**Methodology:-**The research approach for study was quantitative research study, research design used was pre experimental one group pre test&post test design, and population of study was married women, 300 samples selected for study by using non probability convenient sampling technique. Two tools used to assess cognizance and in depth perception of participant regarding antenatal assessment of maternal and fetal wellbeing. Prior to collect data tool was validated from experts and confirmed reliable by using split half method and test retest method. Data collected from 300 married women who participated in study. Following pre-test integrated training programme provided to participants after 1 week of integrated training programme post

test done by using 2 tools cognizance level and attitude scale all collected data coded and tabulated for result analysis.

**FINDINGS:-**Majority 298(99.3%) married women gained knowledge regarding introduction of antenatal assessment of maternal and foetal wellbeing after integrated training programme. Majority 299(99.7%) married women gained knowledge regarding history taking during antenatal assessment after integrated training programme. Majority 297(99%) women gained knowledge regarding general examination during antenatal assessment of maternal and foetal wellbeing after integrated training programme. Majority 286(95.3%) women gained knowledge regarding USG during antenatal assessment of maternal and foetal wellbeing after integrated training programme. Majority 297(99%) married women gained knowledge regarding non stress test during antenatal assessment of maternal and foetal wellbeing after integrated training programme. Majority 294 (98%) women gained knowledge regarding foetal movement count during antenatal assessment of maternal and foetal wellbeing after integrated training programme. Majority 297(99%) married women gained knowledge regarding triple marker test during antenatal assessment of maternal and foetal wellbeing after integrated training programme. attitude becomes favourable after integrated training programme. The significant difference between pre test and post test cognizance and perception level regarding antenatal assessment of maternal; and fetal wellbeing among married women reveal that integrated training program was effective. Thus, H1 is accepted and H0 is rejected

**CONCLUSION:-**The huge mean difference between pre test and post value of cognizance level of participants reveal that integrated training program was effective to provide knowledge regarding antenatal assessment of maternal and fetal wellbeing.

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## **IMPACT OF INTERTWINED TRAINING PROGRAMME ON BEHAVIOURAL OUTGROWTH REGARDING PRENATAL ASSESSMENT OF MOTHERS**

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**ABSTRACT-** The present study was undertaken to determine effectiveness of integrated training program on cognizance and perspective level regarding antenatal assessment of maternal and fetal well being among married women.

**KEY WORDS-**Women, Fetal.

### **INTRODUCTION-**

The present study was undertaken to determine effectiveness of integrated training program on cognizance and perspective level regarding antenatal assessment of maternal and fetal well being among married women.

The purpose of study was to find out cognizance and perspective level of married women regarding antenatal assessment of maternal and fetal wellbeing for achieving this purpose research scholar prepared structured questionnaire and attitude rating scale, then given to participants to fill it according to them before intervention then took it back and based on scoring obtained them research scholar assessed cognizance and perspective level regarding antenatal assessment of maternal and fetal well being among married women.

### **SCOPE OF STUDY**

#### **Benefits for mothers**

- 1] This study will help in revealing existing awareness of married women regarding antenatal assessment.
- 2] This study will help married women in increasing their knowledge on various antenatal assessment of maternal and foetal wellbeing.
- 3] This study will help in reducing barriers of married women for taking proper action when antenatal complication is suspected.
- 4] This study will aid in cumulative knowledge of married woman related to legal information of various laws against antenatal examination of mother & foetus wellbeing.
- 5] This study will help in increasing awareness of various social activities and various NGOs which help in reducing maternal and infant mortality and morbidity rate.

#### **Benefits for children**

- 1] This study will help to stimulate and increase interest in prevention and reduction of neonatal mortality and morbidity rate.
- 2] This study will help in preventing various disorders like mental, emotional and behavioural.

#### **Benefits for Society**

- 1] This research work would help society in spreading knowledge related to how significant authorities which help in taking necessary action on antenatal assessment of mother and foetal well being.
- 2] This research work would help authorities to educate married women from rural and urban areas related to antenatal assessment of mother and foetal wellbeing.
- 3] This research work would help society in identifying risk factors of antenatal assessment.

4] This research work would help society in reducing harm to antenatal women and neonates as well as protect them effectively by providing information about various NGOs and legal.

5] This research work would provide chances to societies in lecturing & finally preventing range of antenatal complications which impairs health and quality of life of antenatal and married women.

Aids for Higher authorities and organizations

1] This study will provide benefits and will help in fulfilling scopes of governance in respect to safeguarding and protection.

2] This study will provide empirical evidence in improving quality of many legal and organizational decisions.

### **Nursing practice**

Nurses doing duty in several wards such as isolation ward, CSSD, OPD, general wards during their duty schedule they should get training regarding antenatal assessment of maternal and fetal wellbeing. Need to provide Health education to pregnant women and their relatives who admitted in hospital regarding antenatal assessment of maternal and fetal wellbeing. Women who admitted in wards should be counselled regarding importance antenatal assessment. Community health nurses should learn antenatal assessment of maternal and fetal wellbeing and also train dais, ASHA workers regarding effective methods to prevent from maternal and fetal mortality and morbidity during their home visits. Nurses should learn to interpret findings of antenatal assessment.

### **Nursing research**

Further research studies carries to make women to train regarding antenatal assessment of maternal and fetal wellbeing. Nursing researcher should include topics that help to construct new APP and strategies to train women. Nursing researcher should carry further studies in health care premises to make women aware about antenatal assessment of maternal and fetal wellbeing. Regular survey conducted in community and hospitals to confirm attitude and practice of women regarding antenatal assessment of maternal and fetal wellbeing. Nursing researcher should conduct survey on reporting strategies of antenatal complications. Nursing researcher should carry research to counsel husband regarding their role in care of pregnant women among their wife through training program. Nursing researcher should carry research to counsel women regarding their role in prevention of maternal and fetal mortality and morbidity.

### **LIMITATIONS**

The limitation of research is defines as boundary set by researcher before conduct study. They are shortcoming conditions or influences that cannot be controlled by researcher.

Primary Limitations are-

1] This study was limited to Navi Mumbai.

2] This study was limited to selected communities of Navi Mumbai.

3] This study was limited to married women of selected communities.

4] This study is limited to availability of married women at time of data collection.

5] Study was limited to 300 selected married women only.

6] In this study, only selected antenatal assessment of maternal and fetal wellbeing will be educated by researcher.

7] Data collection period was limited to 6 months.

8] Findings of this study will be applicable only to samples under study.

9] Study was limited to cognizance and perspective of married women regarding antenatal assessment of maternal and fetal wellbeing.

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## **Pandemic a Corona virus Malady, Assessment under Ward versus ICU and their reposition of data for future precautions**

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### **ABSTRACT:**

Corona virus is life threatening and deadly pandemic spread in the entire globe. It destroys millions of lives, health and wealth. It was newly occurrence of pandemic which caused contagious and rapid increase in mortality rate around the world. It was considered that it broke out from Wuhan (China) and in rapid spike spread in each and every corner of the world. It creates health emergency in every country and leads to provide immediate health security by the clinician and physician to every individual. Due to lack of data and incomplete knowledge against the infection of SARS CoV -2 it becomes very difficult for the health care workers to control over the pandemic. This pandemic was considered as a malady and it damage every class of society very badly. In this study we did assessment of patient, infected by SARS CoV-2 under ward versus ICU. Their illness and symptoms in ward were compared to the illness in ICU. Whereas age structure was given as key role in this assessment and analyzation of illness caused by corona virus pandemic. 200 patient were analyse from ward whereas 200 from ICU, which reflects their illness even they studied for their co-morbidity illness and mortality rate. The most important data found in this study was maximum number of patients defines their severity of illness and their co-morbidity illness according to the age structure and rate of infection persist which can more worsen the health situations. Every infected individual reveal one or other side of corona virus infection and those collected and reposition of data helps further to tackle the patients, situation and to control over the pandemic. Availability of data in future prospectus will helps physician, clinicians, researchers to understand the condition of illness, severity of disease to overcome the situation which can cause less damage to health and lives. Studies against corona virus illness by researchers is very essential part as each and every related study will put forward the new face and diagnosis of illness and it will help in future rapid control over the situation and minimize the infection and rate of mortality caused by SARS CoV-2.

**KEYWORDS:-**SARS CoV-2, Malady, Assessment, pandemic, co-morbidity, reposition, data, precautions, future. ICU, ward etc.

**INTRODUCTION:-**The outbreak of corona virus disease 2019 (covid -19) becomes the major severe respiratory syndrome. It starts initially from China (Wuhan) from December 2019. It becomes an international health concern for public including front line worriers like doctors, police, health workers, cleaning workers. Etc. It starts rapidly spreading in the entire world. It was declared as an emergency of international concern on 30<sup>th</sup> January 2020. It grabs

the attention of entire world where there is no particular medicine and treatment to give relaxation against covid-19 illness.

Covid-19 is highly contagious, infectious and deadly disease for all including every age group of an individuals. It rapidly increases the rate of mortality among all individuals in the entire world. It starts from mild symptoms and rapidly leads to severe infections against the normal healthy people. It called as a severe pandemic as it destroys millions of lives, health, wealth etc around the globe. Every patient infected by the infection of SARS CoV -2 admitted under the hospital or many of them with less symptoms do separate home quarantine. Patients admitted under hospital they were under the surveillance of general ward of an hospital or ICU with more and severe critical illness and according to the health status, symptoms and severity of illness. Similarly, effects of covid -19 were somehow connected with the age of patients, comorbidity illness, history of previous other infection, role of other deadly micro-organisms persists in the body, role and level of immune cells and antibodies production in the body against the load of viral infection in the body. Patients' suffering from immunocompromised diseases and illness becomes the first line to develop the infection of SARS CoV -2. Patient under the hospital surveillance also increases the chances of nosocomial infection simultaneously with infection of corona virus which will much deteriorate the health of an individual. Corona viruses cause the drastic change in the entire world which leads to change in life style, economic and scenario of lives. Identification of covid -19 illness was very drastically affecting the complete global environment and there is no particular relevant data that can secure the health and illness of patients on an emergency level. It was been observed that diseases which was successfully studied, researched and diagnosed can helps to prevent the severe illness among the patients and prevent from rapid spreading between the people. Infection caused by SARS CoV -2 was not fully researched and there was insufficient data that can helps to over the with the pandemic situation and to manage the health and illness and to control the mortality rate. It was obviously noted and observed that data from previous exposure, history, re-emergence of disease helps to recover early from illness and overcome with the pandemic situation. Lacks of data and information related to SARS CoV-2 create difficulty in managing the health, illness and severity of the infection. The director of WHO General Tedros Adhanom Ghebreyesus at the Munich Security Conference on 15 February 2020 said that "We are not just fighting with an epidemic; we are fighting an infodemic". It was very clearly noted that we have less information regarding

any kind of illness it will become difficult for the situation of illness to overcome and if we store the relevant data for SARS CoV -2 or corona virus it will safeguard in future to fight with the pandemic illness and to deal with the situations efficiently. For healthy precautions and to develop strong awareness regarding the disease among the people it is very necessary to repository, the data of corona virus illness as much as possible which will help in present as well as in future to overcome with the health illness and secure the life at maximum level.

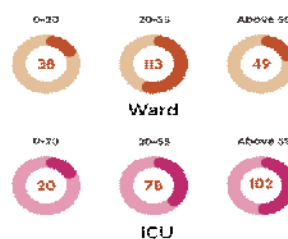
**METHODS:-**This research was carried as an assessment and analysis of patients infected with SARS CoV -2 infections. Patients with severe infection generally hospitalized under the physician of an hospital for early recover of the illness. A physician in such situation gives their level best to deal with health of an individual under their supervision. Patients with serious illness and high rate of infection generally admitted under the Intensive Care Unit (ICU) and patients with less symptoms and illness of corona virus generally admitted under the general ward of an hospital who shows minimum rate of infection and recover early by minor treatment and in short duration of illness. Storage of particular data of every patient infected by corona virus is another scenario of this study. As each and every patient show different kind of illness and revealed the new and interesting data regarding the corona virus illness. Study of every patient and assessment of their health with respect to their admission in ward or ICU of an hospital gives significant amount of data related to infection caused by SARS CoV-2.

**This research was carried under 4 parameters:**

1. To study age structure under ward and ICU.
2. To examine and analyse their co-morbidity illness.
3. To assess and analyse their health with respect to ward and ICU.
4. Awareness against covid-19 illness and reposition of data.

**1<sup>st</sup> parameter:-**This step was performed as 200 patients was examined for their age under general ward as well as 200 was analysed for their age group under critical unit i.e., ICU of a hospital. A very efficient data was isolated after the study of such parameters it shows that people with elder age group are generally more critical and were more in numbers in ICU as compared to patients with smaller age group are generally more in general ward. Patients under general ward and ICU were categorized under 3 age group that is 0 -20 years, 20 -55 years and

above 55 years. Total number of patients in particular age group was noted and were been observed and studied for their illness and symptoms. Study of age group helps us to define their critical illness, rate of infections according to their age group, role of immunity plays in control of infection according to the age, co-morbidity according to the age. Data of every patient that were under the surveillance of hospital were analysed to obtain a successful study of age structure which will further helps to assess various others parameters of illness according to their age criteria they belong.



**Fig 1.1 Age structure of patients under general ward.**

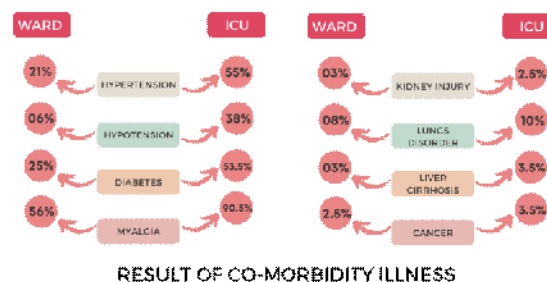
**2<sup>nd</sup> parameter:-**In this stage we studied the co-morbidity which helps to analysed the health illness and severity of corona virus infection with respect to age and co-existing illness this all-related information was gathered by the documentation of patients admitted under hospital supervision and stored for the future reference. Age structure of all 3 groups including ward and hospital was analyse and data recorded which will further helps to specify the illness and existence of diseases according to the age of an individual. Step-2 of this study will determine the exact illness cause due to covid-19 infection as well as development of other symptoms due to co-existence and co-morbidity of their illness which can occur due to age. Every patient shows different kind of co-morbidity illness and that leads to change in the symptoms of covid-19 infection. Patient suffering from covid-19 infection is immunocompromised and can develop occurrence of various other diseases simultaneously. Even patient with already suffering from history of some deadly diseases are more prone to develop infection caused by SARS CoV-2.

**3<sup>rd</sup> parameter:-**This step involves that after studying their age structure and after analysisation of different co-morbidity with respect to their age group assessment of health with respect to the patients admitted under ward or ICU. This stage helps to understand the illness and symptoms of covid-19 in patients who are under the surveillance of general ward versus the patients under ICU. Less symptomatic and younger age group generally shows less symptoms are under ward

whereas patients with elder age group with severe symptoms are under the supervision of ICU. This step helps to distinguish the condition of treatment, facilities in ICU versus ward as well as symptoms under ICU and ward of and patients with respect to their age and co-morbidity.

**4<sup>th</sup> parameter:-**This step involves the data collected and particular information obtained against the infection of SARS CoV-2 or corona virus should be safely secured with respect to every patient as different patient reveals the different symptoms, sign and illness which will further helps the clinicians, health workers and physicians to control the situation and occurrence of sudden illness. Many different kinds of data can recover in study related to covid-19 and that will help to create awareness among the people to control the pandemic and join hands in hands with super-workers of corona virus illness.

**RESULT:-**After studying the data of 400 patients separated 200 from general ward and 200 from ICU infected by SARS CoV-2 a very elaborated data was isolated and revealed. It was found that patient with lower age group are generally shows less symptoms of covid-19 illness and shows highest rate of recovery and were more in numbers in general ward. Patients suffering from corona virus illness with elder age group are having more symptoms and increased rate of co-morbidity and were more in ICU than in general ward.



Patients shows high rate of breathlessness, dyspnea, fever and cold cough are generally under the supervision of ICU where supply of oxygen to the patients on continuous basis helps them recover. Support of ventilation system, Bi-Pap, tracheal insulation etc were used on heavily symptomatic and older age of individual. Where 10% of patients in younger age group that is 0-20 years shows under surveillance and need of ICU for recovery, the reason behind this was obtained that due less immunity and co-morbidity of other illness they are immunocompromised and are more prone to infection than elder age group and 19% in ward as they are less

symptomatic and was recover under normal observation of ward with the use of antibiotic and these patients do not show increased rate of dyspnea and ventilator support system for recovery. Patients of middle age group between 20 -55 years are 56% in ward and 39% in ICU who shows more co-morbidity in patients under ICU supervision than ward. Recovery rate was more in middle age of ward patients than in ICU and due to development and prognosis of illness 16% of patients need emergence shift from general ward to ICU support oxygen and ventilator system against increased symptoms like dyspnea etc. It was assessed that patient above 55 years of age are 24% in ward and 51 % in ICU the reason analyse behind this the elder age group are having more co-morbidity illness and due to increased age factor prognosis of SARS CoV -2 is increased as they are highly immunocompromised by the other co-existence illness recover from corona virus simultaneously is more complicated and chances of mortality is increased. It was also observed and studied that patient under general ward shows minor symptoms and show faster rate of recovery. Whereas patients under ICU shows slower rate of recovery and increased mortality was observed in ICU as compared to ward. All collected data against the covid -19 illness helps us to secure the relevant data that will help in future to recover early from the illness. Findings behind every patient revealed one or the other side of infections that helps to create awareness against the corona virus infection and it will also help physicians and clinicians to rapidly control the new arising situation and health of the patients. Reposition of data is one most important part of this research study it will further helps in fighting with the pandemic situations.

**CONCLUSION:-**After this study it is concluded that infection of SARS CoV -2 is mild in patients under lower age group and in youngsters but people with other previous history of infectious can show increased infection rate it is also concluded that elder age group above 55 show highest rate of infection with increased mortality rate. It is also concluded that this is novel pandemic illness for the world and data collected against the illness should be re-posit very efficiently for future precautions and rapidly deal with the illness. Novel diseases take time to come under control and at the same time lacking in related data can make situations more complicated and difficult to overcome. Infection caused by SARSCoV -2 is new for entire world and hence each and every collected data should be carefully re-positing for future precautions and early tackle the situation as well as patients efficiently.



**FUTURE SCOPE:** -It was been observed that patients under general ward with younger age group and with less symptoms recovers early from the illness whereas patients under ICU having more symptoms and illness of covid -19 takes more time to recover and some may face mortality. The reason behind their death is various like increases age factors, co-morbidity illness, increased load of corona virus etc. But if physician, researchers and clinician have collection of knowledge, data regarding corona virus infection it will be easy to understand the illness and severity of diseases. Collection of data will help in future prospectus to early cope -up with the situations happening in future from covid -19. Different variants of corona virus show different effects and symptoms, study of their genetic sequences helps in future to understand their role in infections and illness. Identification of virus by their genomic analysis helps in identification of illness and severity of disease.

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## Tribological behaviour of Aluminium LM25/ SiC on Tribological parameters

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**Abstract:**-Aluminium silico n carbide metal matrix composites are gaining popularity in the automotive industry. High strength to weight ratio, good workability, great cast ability, good thermal conductivity, and corrosion resistance are some of the most appealing qualities of Al–SiC base alloys. Aluminium LM25+SiC composites having three different weight percentages of SiC (5%, 10%, and 15%) have been manufactured by casting process in this research. Under dry sliding conditions, the friction and wear characteristics of Al LM25+SiC c omposites were evaluated and compared to those of pure aluminium LM25. Dry sliding wear tests were performed on a pin -on-disk machine at normal loads of 1, 2, and 3 kg, and the results were analysed using Design Expert 7 software. Alloy pins with a diameter of 8mm and a length of 30mm are available. Variations in load, speed, and sliding distance are used to test the material above. The wear rate varies linearly with normal load in both composite and base material, but is lower in composite than in base material. Experimentation also revealed that the wear rate decreases linearly as the weight fraction of SiC increases.

**Keywords:** MMCs, Design of Expert (DOE), sliding distance (sd).

**1. INTRODUCTION** -A composite material is a "material system" made up of two or more micro or macro elements that differ in shape, chemical composition, and are largely insoluble in one another. Metal matrix composites have been one of the most significant material breakthroughs in the last 25 years. Because of their remarkable mechanical and physical qualities, particle reinforced light metals are already garnering the attention of material producers and end users. The following are the main benefits of using MMCs in the automotive industry: reduced mass, particularly in engine parts, improved wear resistance or lubrication characteristics, improved material properties, particularly stiffness and strength, providing either increased component durability or allowing more extreme service conditions, reduced thermal expansion coefficient. The growing demand for light-weight, low-cost, energy-efficient, stiff, and strong materials in aircraft, space, defence, and automotive applications has sparked a steady increase in composite material development. Aluminium -matrix composites, like other composites, are a group of materials whose stiffness, strength, density, thermal, and electrical properties may all be modified. To obtain the desired qualities, the matrix alloy, reinforcement material, volume and shape of the reinforcement, placement of the enforcement, and fabrication method can all be changed. Various fabrication techniques of Metal matrix composites are compo casting, stir casting, powder metallurgy etc. It is found from the various research works that selection of accurate processing parameters and fabrication technique are crucial to produce sound and defect free casting. Wear is one of the most typical industrial difficulties that necessitates component and assembly replacement in engineering. As a result, several efforts have been undertaken to develop more durable materials and ways for reducing tool and technical component wear. These include changes to the materials' bulk qualities, surface treatments, and the application of coatings, among other things. Many attempts have been made in recent years to understand the wear behaviour of sliding contact surfaces and the process that causes wear. In the industry, the use of aluminium and its alloys for machine parts is growing by

the day. However, little is known about the wear behaviour of aluminium and its alloys when grain refiners and modifiers are added. Following review of literature is carried out for this research study. In this research work silicon carbide ceramics reinforcement was embedded in aluminium alloy LM25 matrix. It has been used in industries for a long period owing to its unique combination of properties such as high hardness, high modulus, high temperature strength, good oxidation resistance, excellent wear resistance, good thermal shock resistance, and high thermal conductivity (Sharma et al., 2020).

Sathisha and Karthick (2020) investigated wear behaviour of SiC reinforced AL7075 through taguchi method using pin on disc tribometer. The wear study is carried out with the parameters sliding velocity in m/s (1, 2 and 3), sliding distance in m (1000, 1400 and 1800) and percentage of SiC composition (0%, 4% and 6%). For this experimental investigation the sliding distance was the most significant factor among three. The microstructure analysis demonstrated that there is a SiC particle which reduces wear of the samples.

Stir casting was used to investigate the wear behaviour of aluminium alloy LM 25 and its composites reinforced with 7.5 percent SiC 2.5 percent TiO<sub>2</sub> and 2.5 percent SiC 7.5 percent TiO<sub>2</sub> to determine which constituent has the most impact on the metal matrix composites. The results demonstrated that SiC and TiO<sub>2</sub> reinforcement increased the wear resistance of the LM 25 alloy composite (Elango et al., 2014)

Venkatachalam and Kumaravel (2017) investigated wear behavior of Al6082 reinforced with SiC/Fly Ash/Basalt Composite for Brake Rotor. In this investigation, Al6082 composites were developed by stir casting method by varying weight percentage of reinforcements for Sample 1 (Al 90% + SiC 10%), Sample 2 (Al 90% + SiC 5% + fly ash 5%) and Sample 3 (Al 90% + SiC 5% + basalt 5%). The result revealed that wear rates of the composite materials is lower than that of the matrix alloy and friction coefficient was minimum.

## 2. EXPERIMENTAL PROCEDURE-

2.1 Materials and methods - In this investigation LM25 is used as matrix material and silicon carbide is used as reinforcement. Composites with 5%, 10% and 15% of SiC is fabricated by stir casting method. The standard samples of LM25 and composite material (pins – cylindrical shape) have been prepared (Ø8mm X 30 mm).



Fig.1- Wear and Friction Monitor



Fig.2- Top View of Pin-On-Disc Machine

2.2 WEAR TEST—Pin-on-disc machine model TR – 20 supplied by M/S Ducom, Bangalore was used to conduct dry sliding wear tests for aluminium LM25&composites. Wear tests were carried out on cylindrical samples (8mm X 30mm) with flat surfaces in the contact zone and the rounded corner of a 160mm diameter spinning disc manufactured of En-32 steel with a hardness of HRC65, as provided on a pin-on-disc machine. The wear experiments were carried out at three different loads: 10, 20, and 30 N. Each wear test was performed with a 1, 1.5, 2 km sliding distance and speeds of 200,400, and 600 rpm. The tangential force has been continuously checked. The digital display of a pin on a disc machine measures frictional force and wear. This

machine can also be used to investigate the friction and wear characteristics of sliding contacts under specific conditions. Between the stationary pin and the rotating disc, sliding occurs. The normal load, rotational speed, and diameter of the wear track can all be changed to meet the test conditions. Electronic sensors measure tangential frictional force and wear which are then recorded on a computer. These parameters are offered as load and speed functions. The normal load and friction force were used to calculate the friction coefficients.

**2.3 DESIGN OF EXPERIMENT** –It is a system based on statistics and other disciplines for planning experiments efficiently and effectively in order to get reliable conclusions from the examination of experimental data. The pattern of observations to be made with the least amount of experimental effort is determined by the design of experiments. The usage of orthogonal Arrays (OA) for DOE, in particular, provides an efficient and effective way for identifying the most important elements and interactions in a given design challenge. Orthogonal array L9 is used for this investigation.

**3. RESULTS & DISCUSSIONS** –DOE-Software is used to examine the outcomes of the experiments. For pure aluminum LM25, Fig.2 (a -c) shows the change of wear with load, velocity, and sliding distance. For load and velocity, the wear rate increases linearly, but the influence of sliding distance on wear is normal. The wear of the composite (Al LM25+10SiC) is, however, less than that of pure Al LM25, as seen in fig.3 (a -c). Table 1 shows the experimental results of pure and composite materials.

Table 1-Effect of addition of SiC in Al-LM25 on wear.

Load 10 N		Speed 200 rpm	
Sliding Distance (m)	Wear (LM25) (micron)	Wear (LM25+10%SiC) (micron)	
200	139.20	107.21	
400	248.59	120.63	
600	300.46	137.03	
800	351.35	151.65	
1000	451.14	165.65	

For pure material and composite, Figures 4 and 5 show the interaction effect of load and velocity on wear. The rate of wear increases as the load and velocity increase. Wear loss is highest for aluminum LM25 and subsequently lowers as SiC percentage increases up to 10%, however this trend reverses for 15 percent SiC content due to non-uniform mixing.

**Taguchi's method**- Taguchi's orthogonal arrays technique was utilized to investigate friction and wear characteristics in the trials. To determine the relationship between three variables/factors (W, V, COF, and S) on wear and friction, a fractional design with orthogonal array (OA) is utilized. There are three levels for each element.

Table 2-Layout of L<sub>9</sub> (3<sup>4</sup>) Orthogonal Array for Experimentations

Trial No.	A Load (Kg)	B Velocity (m/s)	C SD(Km)
1	1	1.047	1
2	1	2.094	1.5
3	1	3.14	2
4	2	1.047	1.5
5	2	2.094	2
6	2	3.14	1
7	3	1.047	2
8	3	2.094	1
9	3	3.14	1.5

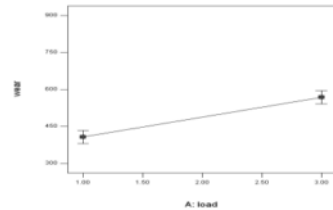


Fig.2(a)variation of wear with load for Al-LM25

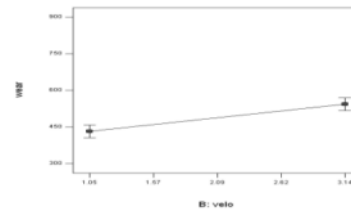
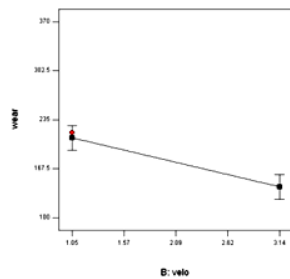


Fig. 2(b) variation of wear with velocity for AL25+SiC



2(c) variation of wear with sd. for ALLM25

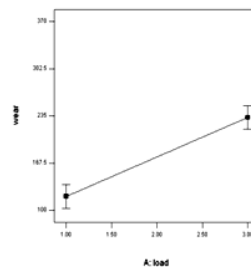


Fig.3 (a) wear v/s load for Al-Im25+10%SiC

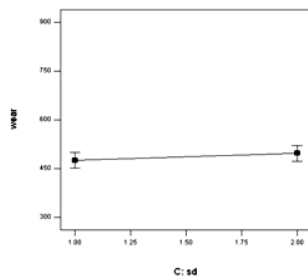


Fig.3(b)wear v/s vel.for Al.lm25+10%SiC

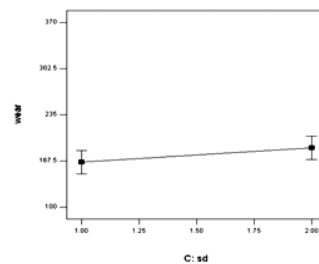


Fig.(c) wear v/s sd. For AlHm 25+10% SiC

**CONCLUSIONS -**

The findings of the experiment are as follows:

1. The wear rate of composite and pure material pins increases linearly with velocity under dry sliding for a given weight.
2. As the normal load increases, the wear rate increases linearly. However, as compared to pure aluminium LM25, the composites exhibit a lower rate of wear (up to 10% SiC).
3. Because of non-uniform mixing, the wear rate increases again at 15% SiC.

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## **A Review of Literature of Public Libraries in India**

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**Abstract:-**The dictionary meaning of “Review” is to think or talk about something again, in order to make changes to it or to make a decision about it. Here, a few articles have been taken for literature review. The topics are related to different aspects of Library field, special focus on Public libraries. As we all know the main purpose of Public Libraries is to provide the required information and knowledge to all types of the users without any discrimination. The real purpose of Public Libraries will be fulfilled only when Government not only concentrate on its Quantity but work on its Quality aspects also by which it would be able to target all kind of users. By this we can fulfill all five laws of the Library science (1. Books are for use, 2. Every reader his/her book, 3. Every book its reader, 4. Save the time of the reader, 5. A library is a growing organism) which is given by S.R. Ranganathan. The literature review helps to know and understand a wide range of concepts in relation to the phenomenon of interest. Present study aims to conduct a review of the literature to know the development of public libraries in India. The study makes to ascertain the progress of public Library, users of Public Library and also present status of public library in India.

**Keyword-**ICT, PublicPrivate Partnership, Public Library Development, India.

**Introduction:-**The main purpose of Public library is to provide knowledge and information to its each and every user. The purpose of Public Library would be systematically fulfilled if we apply all 5 laws of library science properly. These laws help to maintain the quality factor of Public libraries. The success of any Public Library depend on how much users are taking its benefits and is Library is able in providing the required information to its users on time. In India the condition of Public Libraries is not in very good condition.

### **Objective of Study**

Following objectives of the present study.

1. To know the development of Public libraries in India through a literature analysis.
2. To know the finding of various study on Public Libraries in India.

**Scope of the Study :-**This study is about Public Libraries. It will help us to understand the real meaning of Public Library, its importance and utility in the study. This study also tries to find out the reasons that why we are lagging behind in this field though we accept Public Libraries as an essential part of the society.

### **Literature Review**

**Pravakar Rath (2019)** in his article “Public Libraries and Bridging Digital Divide in Indian Perspective” tells the importance and emergence of implementation of ICT and availability of Internet with Automation and Digitization in libraries is the important step that should be taken

immediately. In a free democrat India, it is very important that everyone should have easily access to Public library resources to get the required information and knowledge in their preferred language. Now, it is demand of the time that resources should be more and more digital, it helps in making the universal access easy. Rural Public libraries should be more focused as they face minimum resources or kind of no resources and we can use rural libraries as community information centers. National Knowledge commission felt that that it is high to review the library services. National Mission on libraries (NML) also decides some important areas which should be focused like - Creation of national virtual library of India, setting up of NML model libraries, quantitative and qualitative survey of libraries, capacity building. It is very important to develop ICT infrastructure and modernize our libraries. Public Libraries emerged as a Gateway to knowledge and its development should also be done to keep thing in mind that it brings national development also. It brings responsibility on librarian and on staff also. Then it will definitely bring change in libraries and remove the gap between information rich and information poor countries.

**Muralidhar & Koteswara (2013)** in this article “ Development of Public Libraries through Public-private Partnership in India: Issues and Challenges” explains and talked about the very useful notion i.e Public -Private Partnership (PPP) in development and progress of Public libraries in all over India. This article describes us how important and useful conception it is. Authors also stress on the idea that its implementation is very much necessary and it would be very fruitful also and they also tell us how it is different from privatization. India is underdeveloped country and it is 2<sup>nd</sup> largest populated country in the world. The main reason of it's under development is that Government would not able to provide basic things in the country and education is one of the most important basic things. So, it is not wrong to say that by focus and improving the education, information and library services can be the best solution of all these. To keep these concepts in mind Dr. Manmohan Singh, the Prime Minister of India then established National Knowledge Commission. This commission directs 10 recommendations for improvement of Public libraries in India. As we know that Public libraries is main and easiest source of getting information, knowledge and awareness for normal public. So, encourage and make more and more people involved is main target and recommendation of this commission. The PPP is private sector participating in matter of finance, construction, operation or maintenance of public sector's programs and projects. Further Private Public Partnership helps in implementing government policies and schemes easily with the help of private sector. All non-government agencies like voluntary organization, individual or community based organization, corporate sector etc.

Government need financial help, support for infrastructure and technical aspects from organizations and private agencies as Government alone cannot do all such things. Tata industries, Infosys software company, Bangalore are the few name big names, these groups took many initiatives and spends lots of money in billions so far in various schemes related to education. Tata group started various projects for development of the society and under the PPT it set up various Public and rural libraries in various part of the country. Infosys undertakes the largest rural education programmes in India. In Orissa and other southern states, they donated books under its 'Library for every rural school project' and set up many libraries in rural government schools and provide various subject books. It was a really good initiative of him, it gives magnify encouragement to Public libraries of India. So this is the benefit of PPT because these types of private firms help and support government very well and by this way our education system, the condition of our Public libraries would be improved.

**Navin Prasad (2016)** describes the various development stages of Public Library in India. Indian civilization is one of the oldest civilizations. We have always been blessed with people who have great philosophical thinking. We had some of the world's ancient and great Universities like Nalanda, Taxila, and Vikramasila etc. which also give birth to library system in India. Medieval period had also great role in progress of libraries because Mughals had great love for books and arts. Then invention of printing press gives new dimensions to the libraries. The Asiatic Society of Bengal in 1784, The Asiatic Society of Bombay in 1830, The Calcutta Public Library in 1830 & Connemara Public Library in 1896 in Madras were few milestones in the development of Public Library system in India. Then establishment of Delhi Public Library in 1951 and Raja Ram Mohan Roy Library Foundation in 1972 was another feather in its development. The Public Library Act in 1948 as the Madras Public Library Act was one of the major step towards its great progress & development. The committee was also formed as to check the status of development of Public libraries. The committee was formed in 1957 by the name of Sinha Committee. Though many steps have been taken from time to time for the development of Public Libraries in India but still there is a long way to go. There are many things on which we should focus for improve the condition of Public libraries like librarians needs to get updated, new technologies and ICT should be introduced in Public libraries, funds and finance is an other most desirable requirement, etc...

**Raja Thangiah & Kumar Kennedy (2016)** describe in their article in "Changing the role and usage of public libraries: A special reference to district central library, Tirunelveli district - A study" that in this era Public libraries are important in all aspects of our life in education, career skills, entertainment, community functions, competition etc. Public libraries also help in maintain reading habits in common public. In this article authors also survey about the male and female respondents as a library users and they survey that is there any difference between occupations wise among the library usage. In their gender wise distribution of respondents survey they found that where 81.1 percent is male users while only 18.9 percent is female users. This shows the huge difference between the ratio of male and female users. As we all know female users are as important as male users infact it is not wrong to say that female population has more usage of using Public libraries as in if female/ women uses more libraries then they get more aware of many things and issues and women is the main member who influence whole family so awareness and knowledge which women can get from usage of Public libraries is very important. Then author's survey on occupation wise, in this survey they found that 53.8 percent are job seekers who uses Public libraries then it is students with 29.4 percentage and employees are minimum no. of usage with 16.8 percentage only. This survey shows one more thing that this completely wrong perception that the usage of public libraries is just for reading only. People are using it for other useful things also like for employment news, entrance exams preparation, research purposes and so on.

**Research Methodology**-To search, the researcher has performed the google scholar database as a Secondary sources of information has been used for the study. Various key word like public library, public library services, public library in India, Raja Ram Mohan Rai Public Library foundation website, the subject bibliographies, govt. reports on Public libraries, Electronics thesis and dissertation, conference proceeding, at national and international level, also consult for the review of literature of Public Libraries in India.

**Findings of the Study** :-We all eagerly want a well -educated, advanced and developed country. Public Libraries help in this up to a great extent. Somewhere, these factors influence the

Economic, Social, Cultural activities of nation. So, there are some suggestions which we can adopt and improve the function of Public Libraries and make it more fruitful for the people. Funds are the main constraint in progress of Public Libraries. The central Govt. and state Govt. should come together to produce and arrange the budget. In Public Libraries, we should promote the use of electronic information resources as it saves the time of the user as well as of library too and most important it provides the required information only. Language constraint is another factor. India is a multilingual country. So, there should be one universal networking language, by this available information can be accessed by any part of the country and used by all users. The available information and resources should be updated time to time. If we want more and more users involved then Public Libraries authorities should organize information literacy programs in which libraries make the user aware about available information in the Public Library and also tell them how to use it effectively. In this digital era, all Public Libraries should be IT connected, user can access to internet and make his knowledge more fruitful. When we are talking about ICT or Internet then there should be proper provision of electricity, especially in rural areas and small towns, absence of this makes the Internet facility of no use. In Public Libraries there should be provision of e-learning for its users as well as for staff also.

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## Review of Literature of Road and Railway Tunnels

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**Abstract:-** Road tunnels are feasible alternatives to cross a water body or traverse through physical barriers such as mountains, existing roadways, railroads, or facilities; or to satisfy environmental or ecological requirements. Fundamentally tunnels are meant to shorten the travel path. In addition, road tunnels are viable means to minimize potential environmental impacts such as traffic congestion, pedestrian movement, air quality, noise pollution, or visual intrusion to protect areas of special cultural or historical value, such as conservation of districts, buildings or private properties, or for other sustainability reasons such as to avoid the impact on natural habitat or reduced disturbance to surface land. This paper reviews current road and rail tunnels considering Bhatan tunnel on Mumbai Pune express way as a case study. Its existing infrastructure is discussed with a view to suggest suitable modifications for atomization.

**Keyword:-** Physical Barrier, Conservation, Pedestrian movement

**Introduction:-** An expressway is a six- or eight-lane controlled-access highway, that controls the traffic at the entrance and exit by incorporating the design of the slip roads for entry and exit into the design of the highway itself. The objectives of the expressway are as follows:

- To provide a fast moving corridor to minimize the travel time
- To connect the main town ships / commercial centers
- To ensure development of adjoining area
- To relieve pressure on National highway that is already congested and runs through the heart of cities.

India has the third-largest road network in the world spanning 4.69 million km, next in line only to the US and China. However, when it comes to the quality of roads, India lags far behind. Compared to the length of expressways in leading countries, China (84,946 km), the US (75,238 km), Canada (17,000 km), Spain (15,152 km) and Germany (12,800 km), India's progress in the road sector seems dwarfed at just 1208 km. On an overall basis also, highways constitute only a 1.7 per cent share at 79,116 km. Situation is improving since last 5 years.

### History of Tunnels:

1. First tunnel in Babylonia was a brick-lined pedestrian passage some 3,000 feet (900 meters) long was built about 2180 to 2160 B.C. under the Euphrates River to connect the royal palace with the temple.
2. In ancient times a 4,800-foot long road tunnel (the Pausilippo) was built between Naples and Pozzuoli, executed in 36 B.C.
3. First time the ventilation system for tunnel was developed in 1927 in Holland tunnel.
4. In 1952, James S. Robbins came with a good idea **(Give the idea also)** and designs the modern tunnel.
5. In 1988 Japan's 33-mile-long Seikan Tunnel, the world's longest and deepest railway tunnel (787 feet below sea level), connects the islands of Honshu and Hokkaido.
6. In 1994 after 192 years of planning and six years of building, the Channel Tunnel runs under the English Channel. **Is it Suez Canal Tunnel? Give popular names to visualize them and feel new knowledge**



7. The Mumbai Pune Expressway, (officially known as the Yashwantrao Chavan Mumbai Pune Expressway) is India's first six -lane concrete, high -speed, access controlled tolled expressway fully functional and operational in year 2002.

### Types of Tunnels:

Tunnels can be classified into different categories depending on ground conditions, the ground water conditions, the length and diameter of the tunnel drive, the depth of the tunnel, the logistics of supporting the tunnel excavation, the final use and shape of the tunnel and appropriate risks. Out of many different types some are listed below:

- Overground – Cutting the hills
- Underground – Digging soil/Earth
- Normal Tunnels – Vehicular traffic
- Secret Tunnels – Military traffic
- Tunnel on rivers – Requiring Infrastructure for Lighting, Safety etc.
- Special Tunnels – Wild life

**Review of Existing Road and Rail Tunnels:** -At present, as per the available statistics, India has 04 Road Tunnels and 07 Railway tunnels. Detailed Literature review is shown in table form.

Sr. No.	Name	Length	Location
1	Atal Road Tunnel, Himachal Pradesh-Longest High -Altitude Tunnel Inaugurated on October 3, 2020	8.8km approximately.	Leh – Manali Highway, Himachal Pradesh
2	Dr Syama Prasad Mookerjee Road Tunnel, Jammu and Kashmir (Longest Road Tunnel)	9.34 km approximately.	Chenani- Jammu and Kashmir
3	Banihal Qazigund Road Tunnel, Jammu and Kashmir	8.5 km approximately.	PirPanjal Range of Jammu and Kashmir
4	Yashwantrao Chavan Mumbai Pune Expressway (Bhatan Tunnel)	1.1. km approximately.	Kalamboli (Navi Mumbai)- Kiwale (Pune)
1.	PirPanjal Railway Tunnel, Jammu and Kashmir (Longest Railway Tunnel)	11.22 km approximately.	PirPanjal Range, the Himalayas, Jammu and Kashmir.
2.	Trivandrum Port Railway Tunnel, Kerala	9.02 km approximately.	Balaramapuram Station, Kanyakumari – Thiruvananthapuram Railway Line, Kerala
3.	Sangaldan Railway Tunnel, Jammu and Kashmir	8 km approximately.	Lahli Station(Katra – Banihal), Jammu – Baramulla Railway Line, Jammu and Kashmir.
4.	Rapura Railway Tunnel, Andhra Pradesh	6.65 km approximately.	Vijayawada, Andhra Pradesh
5.	Karbude Railway Tunnel, Maharashtra	6.5 km approximately.	Ratnagiri, Maharashtra.
6.	Natuwadi Railway Tunnel, Maharashtra	4.39 km approximately.	Karanjadi - Diwan Khavati railway stations, Maharashtra.
7.	Tike Railway Tunnel, Maharashtra	4.08 km approximately.	Ratnagiri - Nivasar in Maharashtra.

### About Bhatan Tunnel:

The **Mumbai Pune Expressway** , (officially known as the **Yashwantrao Chavan Mumbai Pune Expressway** ) is India's first six -lane concrete, high -speed, access controlled tolled expressway. It spans a distance of 93 km connecting Mumbai, the financial capital of India and the administrative capital of Maharashtra with Pune, an industrial and educational hub. The expressway, which was fully operationalized in 2002, introduced new levels of speed and safety in automobile transportation on Indian roads. It is one of India's busiest roads.





Fig.1. Present Lightening in the Tunnel using Sodium Vapour Lamp

Courtesy: <http://snsvo2.seekandsource.com/illumination/>

It cleaves through the scenic Sahyadri mountain ranges through passes and tunnels. It has five interchanges: Kon (Shedung), Chowk, Khalapur, Kulgao n and Talegaon. The expressway has two carriageways, each with three concrete lanes, separated by a central divider and a tarmac or concrete shoulder on either side. The expressway has reduced the travel time between the two cities of Mumbai and Pune by app roximately two hours. Hence, it is very necessary to equip such expressways and particularly the tunnels with latest technologies to improvise the travel time and safety. As a case study, Mumbai Pune Express way has been chosen for applying latest technolo gies. It is proposed to ensure state of art on this highway equivalent to foreign countries by studying its available facilities to project enhanced facilities. This paper, therefore, proposes to review available literature for collecting information about the world class highways and improvise Indian conditions with latest technologies. **(Here you should give World’s current situation or before Bhatan Tunnel)**

**Essential Infrastructure in Tunnel:**

Following is the list of essential infrastructure needed in tunnel

SrNo	Parameters	Reasons
1.	Good Lighting	To Avoid Accidents and Ensure Smooth Drive
2.	Communication	For Emergency Situations like vehicle breakdown due to engine failure or tier puncture, Accident reporting etc.
3.	Safety	From Temperature, Pollution, Honking... etc.
4.	Security	Accident, Trespassing, Parking etc.
5.	Emergency	In Case of Accident, HighTemperature Level, Traffic Jam.

**Lightening structure of Express way tunnel:** -The tunnel lighting is divided in five zones with different intensity at different distances. The amount of light required within a tunnel is dependent on the level of light outside and on the distance inside the tunnel at which visual adaptation of the user is appropriate. When planning the lighting of a tunnel, there are 5 key areas to consider as shown in fig.1.

**1. Access zone:** It is not within the tunnel buton the stretch of the road leading to its entrance. From this zone, drivers must be able to see into the tunnel in order to detect possible obstacles and to drive into the tunnel with suitable speed.

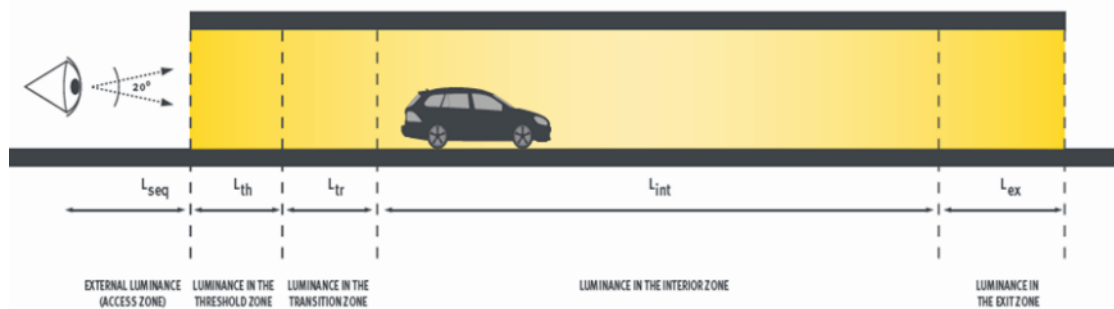


Fig.2.Different zones of the tunnel

**2. Threshold zone:** -The human being's adaptability governs the lighting level in the threshold zone of the tunnel, which is generally equivalent to 450w sodium vapor lamp's luminosity. This zone is equal in length to the 'stopping distance'. In the first part of this zone, the required luminance must remain constant and is linked to the outside luminance and traffic conditions. At the end of the zone, the luminance level provided can be quickly reduced to 40% of the initial value.

**3. Transition zone:** Over the distance of the transition zone, luminance is reduced progressively to reach the level required in the interior zone. The reduction stages must not exceed a ratio of 1:3 as they are linked to the capacity of the human eye to adapt to the environment and, thus, time related. The end of the transition zone is reached when the luminance is equal to 3 times the interior level. In transition level 150w

**4 Interior zones:** This is the area between transition and exit zones, often the longest stretch of the tunnel. Lighting levels are linked to the speed and density of traffic. In this zone the sodium vapour lamp of 70w are used.

**5. Exit zone:** The part of the tunnel between interior zone and portal is known as Exit zone. In this zone, during the day time, the vision of a driver approaching the exit is influenced by brightness outside the tunnel. The human eye can adapt itself almost instantly from low to high light levels, thus the gradually decreasing intensities are now increased in such a way that 450w Sodium vapor lamp is used in exit zone.

#### **Current Infrastructure in Bhatan Tunnel:**

The current status has been collected from the survey conducted and information provided by the MSRDC (Maharashtra State Road Development Corporation), who is responsible for Operation and Maintenance of Yashwantrao Chavan Expressway Mumbai Pune -section of NH-48(Old-NH-4) in the state of Maharashtra.

SrNo	Parameter	Infrastructure
1	Good Lighting	Sodium Vapor Lamps
2	Communication	Hot Line Telephones installed
3	Safety	Sensors analog type and Jet Fan
4	Security	CCTV Camera
5	Emergency	Siren and Traffic jam Indicator.

**Significance of sodium vapour lamps over mercury vapour lamps:** -White light consists of seven colours-VIBGYOR. During foggy days; air is highly humid and contains lots of tiny water droplets which can act like a prism. So, if white light is used in automobile headlights and street lamps, water droplets will split it into its component colors', thereby creating a circular rainbow around each light source. This affects clarity of vision and may lead to accidents. In order to avoid this effect, a monochromatic (yellow) light source is used. Yellow is chosen because, being in the middle of the visible spectrum, it undergoes medium refraction and medium reflection while passing through a water droplet.

Sodium vapour lamp is a gas discharging lamp which uses sodium in an excited state to produce light near 589 nm wavelength. These lamps are available in low pressure and high pressure varieties applicable. Low pressure sodium lamps are used in outdoor lighting like parking, bridge under pass etc. High Pressure sodium lamps are used in Street, Tunnel, Security lightings etc. Mercury vapour lamp is not preferred because small amount of mercury lamp which may release some mercury vapours if lamp blows off, also mercury lamps are hot as compared to sodium lamp. Mercury lamp also releases high UV radiations which are not good for health.



Fig.3.Sodium Vapour and Mercury Lamps

Courtesy : <https://architectureideas.info/2010/04/lamp-types-sodium-vapour-lamps/>

#### **Advantages of Sodium Vapour Lamps:**

- Most energy efficient light source commercially available, with an efficacy of 100 to 185 lumens per watt.
- Lamps have average life in the 14,000 to 18,000 hour range and have excellent lumen maintenance (very little reduction in lumen output over life of lamp).
- Most lamps will restart immediately after interruption of power supply, but require some time to come up to full brightness.
- Provides superior uniformity of light distribution over all HID lamps.

#### **Disadvantages of Sodium Vapour Lamps:**

- These lamps have poor color rendering characteristics. It is almost impossible to distinguish colors under an LPS (Full Form?) Lamp because light produced by this source is monochromatic (a single color).
- Most expensive lamp to install.
- Run time to full light output is the longest (7 to 15 minutes).
- Wattage will increase over the life of the lamp to maintain lumen output.
- Energy loss in heating the lamp till it becomes fully functional
- Minimum voltage needed to turn on is 180V
- Once switched off it takes time to cool down and after cooling it will be on and again time is needed to completely turn on the lamp.
- Requires special disposal considerations.
- Sodium is hazardous and can catch fire in contact of air.

Hence it is high time to think for new technology lightening system for tunnels which will save time, lighting system operating at low voltages, save energy and are safe from fire.

#### **Advantages Of IoT Network Inside a Tunnel**

The benefits of IoT technology implementation have been already established every day, everywhere. IoT systems can be used in confined infrastructures, in particular to road tunnels, as they can avoid dangerous situations not only for construction and operation teams but also for daily users.

##### **1. Improvement Of The Construction Process**

IoT implementation enables the construction process in carrying out the technical jobs safer and faster and ensures the accuracy and cost-effectiveness of the project. Having an IoT network also ensures the accuracy of measurements and thus enables more detailed and efficient monitoring.

##### **2. Timely Preventive Maintenance**

All the objects installed inside the confined infrastructure are equipped with sensors and thus parameter measurements are communicated by IoT Networks in real-time. Thanks to this, measurements of all fixtures can be periodically examined to detect any weaknesses, enabling the maintenance teams to act proactively in advance. Also, periodic measurements of all vital parameters are made, which helps to detect temperature changes and NO<sub>x</sub>, CO<sub>x</sub> gas, or smoke presence at early stages to avoid any likely danger. In addition, the operating

teams have time and necessary data to do the restoration operations and prevent the falling of any objects, which can cause serious accidents.

3. **Effective Process Automation** :-The key to effective process automation and schedule management is the constant connectivity of all vehicles. Thanks to the IoT systems all along with the infrastructure, the vehicles are always connected to each other and to the infrastructure. Once these connections are made, many security and traffic management solutions can be implemented. For example, speed reduction, detection of broken-down vehicles, detection of overweight vehicles, etc.
4. **Energy Management**:-Last but not the least; electricity consumption is one of the biggest expensive item for tunnel operators. The use of data from IoT sensors makes it possible to measure and manage this consumption with the aim to control and optimize it. For example, radar-type sensors detect the presence of vehicles in certain areas and control the lighting accordingly. In this way, during low traffic times, the lighting is only used when necessary. Hence, the IoT network makes all the interactions between infrastructure, vehicles, and people's security timely and accurate. It minimizes the risks and, of course, saves costs.

**Conclusion**:-After survey and study on Bhat an tunnel it is found that following are the areas in which automation can be done:

- Sodium Vapor Lamp can be replaced with illumination-controlled LED lamps
- Adaptive Control of Light Intensity of each zone proportional to the Lighting Outside the Tunnel
- Installation of Smart Sensors for Detection of Air pollution, CO Level, Wind Direction, Heat, Smoke, Traffic occupancy Intensity Level, Honking, Faulty Lamps.
- Automatic Control of Jet Fan proportional to Pollution and Temperature
- Incorporation of Accident detection
- Automatic Indication of Traffic Jams in Tunnel
- Auto-Messaging / Alarming for Emergency Situations
- Automatic Technical count and Control of their Speed
- Number Plate Detection for issuing warnings

Thus the latest technologies of Smart Sensors and IoT for communication can improve the functioning of the tunnels for faster travel.

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## **A Study to Assess the Knowledge Regarding Leadership Skills among the Nurses in Delhi State**

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**ABSTRACT:-**Nursing services has gained increasing influence in all aspect of healthcare facilities. It is vital that nurses develop leadership skills at an early stage in their career. The objectives of the study are to assess the knowledge regarding leadership skills among nurses. A self-administered questionnaire containing demographic details and knowledge regarding leadership skills in nursing profession was prepared using Google forms and distributed to nurses of India through social media. Total 100 nurses from different hospitals of India participated. Data were coded and analyzed using descriptive statistics. The finding of the study revealed that 5 of subjects had poor knowledge, 44 of subjects had average knowledge and 1 subject had good knowledge regarding leadership skills. There was no statistical association between knowledge and demographic variables. The finding of the study reveals that there is need for the sensitization of nursing staff regarding leadership skills in nursing for the growth and development of nursing profession as a whole.

**Keywords:-** knowledge, leadership skills, nurses.

### **INTRODUCTION**

Leadership is the capacity to translate vision into reality. —Warren Bennis

The old-fashioned view of leadership is that leaders are marked out for leadership from early on their lives, that's not the way we see it now. The modern view is that through patience, persistence and hard work one can be a truly effective leader, just as long as one makes the effort needed. In the modern age, good leaders are an enabling force, helping people and organizations to perform and develop, which implies that a sophisticated alignment be achieved of people's needs and the aims of organization.

Leadership improves the organizational benefits and people health expectations by combining well professional and personal leadership and creating process of achieving goals, aligning processes and procedures. Leadership needs personal attributes such as expertise, integrity, empathy, sharing of authority and principled behavior. Leadership strategies are important in nursing profession to reach their optimum standards in practice environment. Leadership in nursing needs to be fostered in many settings such as clinical management, policy education, and research across public private sectors and at regulatory, organizational and individual level.

Good leaders are followed chiefly because people trust and respect them, rather than the skills they possess. Leadership is about behavior first and then comes skills.

Developing future nurse leaders is one of the greatest challenges faced by nursing profession. Powerful skills are needed for all nurses those providing direct care to those top management positions.<sup>2</sup>

A case study design used to collect sample from January 2006 and December 2007 to explore the concern that leadership skills are lacking. They surveyed 2,200 leaders from the 15 organizations in three countries. Data were collected using modified version of benchmarks. The study showed that crucial leadership skills in today's organizations are insufficient for meeting current and future needs.<sup>3</sup>

A cross-sectional survey was conducted to assess the leadership and quality of care in nursing homes. Data was collected among 900 nurses. Data collection includes, Self-report questionnaires, interviews with and questionnaires, telephone interviews relatives and field observations. Results shows that lack of significant effect for relationship-oriented leadership style was due to a strong correlation between the two leadership styles ( $r = 0.78$ ).<sup>4</sup>

In western nursing setting, nurse assumes various positions as a leader such as Nurse Manager, mentor, Head nurse, extended and expanded role of nurse to deliver high quality care and improves peer group relationships within the policy boundaries in an organization. Whereas the concept of nursing leadership in Indian nursing set-up is emerging now and faces severe shortage of leaders due to the lack of knowledge and attitude regarding leadership, as well as lack of leadership qualities among the nurses. The leader can act as a role model, collaborates to provide optimum care of information and support, providing care based on theory and research, and being an advocate for patients as well as to health care organizations.<sup>5</sup>

Hence lack of leadership qualities among nurses will have ill effects on the improvement of patients health, healthcare delivery system, harmony within the peer group, professional development and ultimately on organizational benefits. Leadership is about engaging with nurses, listening to them and developing the structure processes that will enable them to grow and develop and be the best they can and want to be. Now it is the time to seize the insecure and begin effective leadership skills to provide comprehensive and quality care to patients.<sup>5</sup>

There is a need of improving the leadership skill among the nurses to improve the patients health care, health delivery system, harmony within the peer group, professional growth and ultimately on organizational outcome. Healthcare institutions should draw up visions of nursing leadership in future. Together with universities, they should start planning nurse manager education programmes that focuses on strategic issues, leadership, job satisfaction, challenging situation in leadership, change management, work unit management for helping them to develop as managers and make the successful leadership as a part of multi-professional cooperation. Leadership styles play an integral role in enhancing quality measures in health care and nursing. Impact on health-related outcomes differs according to the different leadership styles, while they may broaden or close the existing gap in health care. Addressing the leadership gap in health care in an evolving and challenging environment constitutes the current and future goal of all societies. Health care organizations need to ensure technical and professional expertise, build capacity, and organizational culture, and balance leadership priorities and existing skills in order to improve quality indicators in health care and move a step forward. Interpretation of the current review's outcomes and translation of the main messages into implementation practices in health care and nursing settings is strongly suggested.<sup>7</sup>

Little is known about the process of nursing leadership learning in practice. This may be because the processes involved in the mechanism of learning have not been clearly described. This may be due to the fact that learning that takes place in practice often occurs implicitly and the knowledge generated remains tacit and unacknowledged. Therefore, it is important to explore how nurse managers learn to lead in practice. This will contribute to a greater understanding of the learning processes involved.<sup>8</sup>

Growing future nurse leaders is a long term quest that requires both planning and action. Our emerging leaders will ultimately replace our current leaders and continue the very important work being done to improve nursing practice environments, and most importantly, patient outcomes. Yet succession planning is challenging today in a healthcare environment that is fast paced and constantly changing. Current nurse leaders are often so consumed with their day to



day work, and they are unaware of the impressions that young emerging leaders may have about their roles and impact.<sup>9</sup>

### OBJECTIVES OF THE STUDY

To assess the knowledge regarding leadership skills among nurses working in Delhi.

### MATERIAL AND METHODS

A Quantitative research approach, non -experimental descriptive research design was adopted to assess the knowledge regarding leadership skills among nurses. An electronic web -based questionnaire was designed to collect data by using Google forms, with a consent form attached. The questionnaire was available to the participants through social media (Whats App, Facebook and Instagram). Study participants included nurses working in Delhi. The participants were encouraged to roll out the survey to as many people as possible. On receiving and clicking the link the participants got auto directed to the information about the study and informed consent. Participation in this study was voluntary and the identification information of participants was not recorded anywhere on the questionnaire. Total 50 nurses from different hospitals of Delhi were participated.

**Description of tool:** -The tool was constructed based on the review of literature, discussion with experts and experience of the investigator.

#### Section A

Demographic Performa includes: Age, Gender, Marital status, Educational status, Year of work experience.

#### Section B

30 objective type items were prepared to assess knowledge regarding leadership skills in nursing profession.

**Plan for data analysis:**-Data was planned to analyse using descriptive statistics.

**Descriptive statistics:** frequency and percentage distribution was used to analyze the baseline data of subjects and their level of knowledge.

### RESULTS

#### Presentation of data

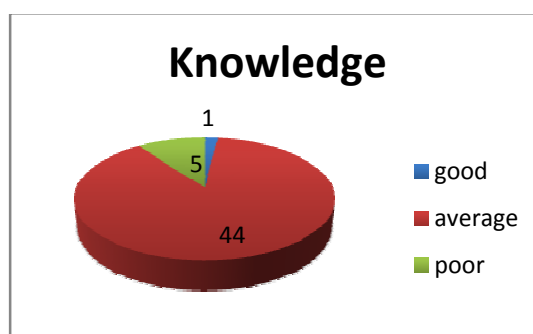
The analysis of data is organized and presented under the following sections: Section I: Analysis of demographic characteristics of subjects.

Section II: Analysis of level of knowledge of subjects regarding leadership skills.

S.No.	Demographic Characteristics	Frequency	Percentage(%)
1	Age in years		
	20-25	43	86
	26-30	6	12
	31-35	1	2
	36 and above		
2	Gender		
	Female	45	90
	Male	5	10
3	Professional Qualification		
	GNM	8	16
	B.Sc. Nursing	32	64
	Post Basic Nursing	8	16

	M.Sc. Nursing	2	4
	PhD	-	-
	Any other		
4	Total experience in years		
	1-5	38	76
	6-10	10	20
	Above 11	2	4

Table 1: Analysis of frequency distribution of nurses according to their demographic characteristics. N=50



The data presented in pie chart depicts that 5 of subjects had poor knowledge, 44 of subjects had average knowledge and 1 subject had good knowledge regarding leadership skill.

**DISCUSSION:-**The data was collected from 50 nurses. Analysis of level of knowledge of subjects regarding leadership skills shows that 5 of subjects had poor knowledge, 44 of subjects had average knowledge and 1 subjects had good knowledge regarding leadership skill.

**CONCLUSION:-**The finding of the study revealed that 5 of subjects had poor knowledge, 44 of subjects had average knowledge and 1 subject had good knowledge regarding leadership skills. Knowledge and practice of nursing skills is mandatory for all nursing personnel for the upliftment of the whole nursing profession. Health education can be given to nurses regarding knowledge and practice of leadership skills. Nurse can be encouraged to develop leadership skill by conducting in- service education programme. Nurse administrator plays a major role in setting an example as a leader. The nurse administrator should take initiative in conducting awareness programme regarding leadership skills. More researches can be conducted regarding leadership skills among nurses with a large sample to generalize the findings.

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## **Application of Information and Communication Technology (ICT) for the Betterment of Higher Education during the period of COVID-19 Pandemic**

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**ABSTRACT:-**The COVID-19 continues to grow at a rapid pace worldwide. The educational dimension has also been affected in the schools and colleges' regular functioning, with the temporary closure of educational institutions, as well as the impediment of face-to-face classes. Many States have struggled to contain the virus and many have failed to ensure that all individuals under their jurisdiction can live with security and dignity in the face of the threat. With per capita infection rates among the highest in the world, the government has had to impose a second nationwide, weeks-long lockdown. Many governments have failed to protect particularly vulnerable communities and individuals under their jurisdiction. This challenging conditions can be a pivotal moment of opportunity for betterment of education, with the implementation, development and diffusion among academic and students, of Application of information and communication technology. The paper also discusses the role of Application of information and communication technology. The methodology used to carry out this study is qualitative, and the teaching employed to analyze the data collection was content analysis. Research studies, in the diver's formats, already published on the COVID-19 topic and its impacts were the elected data sources. The result of these document analysis allow us to conclude that there is the need to improve to digital etching development in education in higher education, that education institute need to betterment the application of information and communication technology in education, education institution need to face-to-face and overcome if they want to be success in the international education. This is the challenges that higher education but also the opportunities that COVID-19 pandemic period to higher education at a time when it needed to define is teaching methods, interaction channels, by going digital towards the improvement of the education.

**KEY WORDS:-**ICT Education, Application, Communication, Betterment, Higher Education, COVID-19 Pandemic,

**INTRODUCTION:-**Corona virus disease (COVID-19) is an infectious disease caused by the SARS-CoV-2 virus. The virus can spread from an infected person's mouth or nose in small liquid particles when they cough, sneeze, speak, sing or breathe. These particles range from larger respiratory droplets to smaller aerosols. It is important to practice respiratory etiquette, the COVID-19 pandemic is a recent topic debated and addressed by numerous researchers in various spheres of social life. For a very short time, a deadly virus annihilated even the world power countries making them all equal to fight this challenge. Even Kosovo is facing many challenges towards facing and fighting the spread of COVID-19, in December 2019, viral outbreak of pneumonia of unknown origin occurred in Wuhan, China. On 9 January 2020, the World Health Organization (WHO) officially announced the discovery of a coronavirus SARS-CoV-2. This new virus is the pathogen responsible for the infectious respiratory disease called COVID-19. The whole world was in deep panic when the World Health Organization declared this deadly virus as a pandemic worldwide in March 2020 specifically on March 11, 2020. The

pandemic caused many surprises in every aspect of life. This pandemic significantly changed people's lifestyles by imposing new measures and for most people unacceptable and easily enforceable. There are the number are studies that have been dedicate to the impact of the COVID-19 pandemic in every sphere of life including economy, social, health, education and other aspects. the focus of this study is the analysis of the transformation of traditional learning or in school learning to distance learning that highlight the importance of ICT sector in the case of Kosovo from the perspective of pupils /universities.in the fremwork of these measures, were also the immediate measures to stop physical attendance in higher education and to switch the teaching process from traditional to online trying to use different application of communication and information technology (ICT .)

### LITRETURE REVIEW

The COVID -19 pandemic causes a series of changes in people's lives all around the world. Every single change result in great consequences for the states economies, the health and education systems, citizen welfare, g enerally caused radical changes following the guideline of the world health organization tool.

Education instates closures due to COVID -19 have left over a billion students out of physical attendance in schools.

Hasan Goldemberg, iqbal & Geven, 2020. The closure of education institute posed a series of dilemmas over the utilization of different methods for implementing online learning and their effectiveness.

Farrington, 2020 in this regard each country has taken measures based on economic and technological capacities, always based on suggestion from the world health organization and the ministry of health of the respective countries.

Costa 2020 concertedly, every crises, be it economic, political etc, deep in the inequality between the rich and the poor.

Marinoni, land & Jensen,2020 regarding the ILO ectorial brief , academic and students have been creative in adopting a variety of information technology and communication .

Intenational labure organization (ILO) 2020 howere no matter how developed a country is in the economic sence or the ICT sector that is seen as necessary for online teaching and learning in time of pandemic.

**METHOD:-**The study was used descriptive approach. Open ended questionnaire was uses to interview 60 respondents from the age group of 20 to 35 years. All the respondents have internet knowledge and samwe social media presence. They are using at least one of the following media; WhatsApp, Instagram, Facebook, Zoom meeting app, some were other platform too.

**SAMPLING:-**Allmost all the res pondents said that whenever they respond to any social media content, their emails start getting spammed by various education communications. On an average, each respondent had 6to 8 spam e -mails in the index, other than those alredy filtered for spam and p romotions. This was found to be intruding the personal and professional space of consumers without their consent.

**COOKIES AND CACHE :-**Usage of internet or brosing any information on the net leads to storeg of cookies and caches. Cookies are the perference s of the browse or the user.like the website visited the web pages, link cliked on etc.respondents felt that the education and advertiging communication sent no social media when cliked on by mistake are also ofeten stired as a cookies or a caches.

**BEHAVIOURAL ADVERTISING:-**A Users online browsing and usages pattern is observed and than marketing communication, mostly advertisement are customized accordingly. one respondent even said that his internet usage is highly restrictive .when he/ she than logged in on a portal for the same, since then he is receiving e-mails and sms from various website.

**REMARKETING:-**Remarketing refers to conduct of marketing efforts repeatedly to reinforce the marketing message. social media and e -commerce websites collaboratively exchange the data and practice remarketing .the practice of remarketing often irritates and annoys the consumers.

**ADVERTISEMENT:-**Social media has become the new hub for advertisers .they have exploited social media in every possible way there are posts, reels, pages forums, sponsored ads, web banners are just the common ways of digital marketing

**PERMISSION AND TERMS AND CONDITIONS :-**All application and websites require permission for usage of data, contact images, files location, etc. they does ask for permission before one interest to use the websites or application. Same is the case when it comes to terms and conditions thus users are compelled to give permission and accept the terms and condition and compromise on their data privacy and security breach.

**PAYMENT /REFUND AND LEGAL AID :-**A common issue with online shopping is the concern of payments and refunds. E -commerce and online shopping also promiss free returns and refund

**FINDING AND DISSCUSSION :-**The results showed that all the seven selected studies were sound. Although the studies were good but could have been more transparent about the content matter. the studies available online application for information and communication technology (ICT) in ethical issues and complete database. There is a great need to look at this concern so that a better data base can be made available online. the paper also triggers the thought to height the ethical practices in digital era for web media.

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- Skype-video and audio calls with taikl ,chat and collaboration featurers.
- Facebook live - is a great fit for business influencer or individuals w ho are looking to broadcast demos, videos or showcases their campany culture while streaming live, following on facebook can comment and chat live, schedule videos ahead of time to gain excitement.



## BERT question answering from scratch to system implementation

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**Abstract**-We see a classroom setting wherein we can imagine about a speech synthesis system. A teacher asks a question, and one or more pupils raise their hands to indicate their response to the instructor's inquiry. That being stated, answering questions might be a simple activity for people, which is not that simple for a computer to perform. Machines must overcome a variety of obstacles in order to provide a response to an any query, including lexical gaps, coreference resolution, linguistic ambiguity, and so on. In order to accomplish this, computers require a large amount of training data as well as a sophisticated architecture that can identify and retain significant information from a text. Recent developments in natural language processing (NLP) have enabled robots to comprehend and perform a variety of activities based on text. In this paper, we will work on one such task —answering questions. We will use a fine -tuned BERT model. BERT stands for Bidirectional Encoder Representations. It is also one of the most commonly used NLP models. BERT models can comprehend a word's context by analysing at the words preceding and following it, which is important for interpreting the query's purpose. Currently, it is employed in many NLP tasks because to its bidirectionality and richer perception of language environment and flow. We will explore more about BERT and the code in this paper. BERT models abound in the Transformers library. Finding a process model which meets our requirement from this collection is simple and hence is used in the implementation.

**Keywords:** NLP, Artificial Intelligence, Chatbot, Text classification, Text analytics

### 1. Overview of BERT

Google AI Language researchers released a study entitled BERT (Bidirectional Encoder Representations from Transformers) recently. Because of a broad range of NLP tasks, such as Question Answering (SQuAD), Speech Recognition, and others, it has created a big impact in the Machine Learning field.

BERT's most significant technological breakthrough is the use of bidirectional learning of Transformers, a prominent attention model, to NLP tasks in order to improve accuracy. It differs from earlier attempts, which examined text sequences from left to right or a combination of left-to-right training with a combination of right-to-left training. The findings of this article demonstrate that a language model that has been bidirectionally trained may have a more accurate idea of language environment and flow than a language model that has only been taught in one way. Specifically, the researchers describe a new method known as Masked LM (MLM), which enables simultaneous training in models that were previously difficult to train in both directions.

Because these models are pre-trained on large unlabelled text datasets such as Wikipedia and then fine-tuned for applications such as question answering, natural language processing has witnessed significant advancements in recent years. This method of pre-training by creating a supervised learning task on unlabelled data is referred to as self-supervised learning, and the most frequent method of pre-training on unlabelled texts is referred to as language modelling (also known as language modelling). The majority of language models are taught by iteratively predicting the next word in a series auto regressively over massive databases of text, such as Wikipedia, over and over again. For example, taking a phrase such as "The cat jumped over the fence" and iteratively anticipating "The cat jumped over the fence" and so on is the most natural method of comprehending this. Additionally, context may also be represented from right to left,

for example, moving from a fence to a bridge and so on. To illustrate, in the above example, some prior models concatenated representations acquired via left-to-right and right-to-left token prediction traversal to create representation for downstream tasks such as Question Answering or Human Language Inference. A language modelling pre-training job of iteratively predicting the next word in the sequence is reformulated to instead include bi-directional context and predict the mass of intermediate tokens in the sequence, as well as forecast the mass tokens. Bert's reformulation is available here. Examine the specifics of how this is implemented, such as the exact masking strategy used and how the inputs are formatted to be passed into Bert, the intermediate representations of this transformer model, the Bert transformer architecture, the output and how this can be used to easily extend the model to fine tuning on sentence level and token level tasks, such as question answering, in greater detail. We will go through the specifics of BERT, which introduced a new self-supervised learning job for pre-training transformers in order to fine tune them for use on downstream tasks.

In the computer vision community, pre training transformers is commonly described as being analogous to transfer learning with ImageNet. However, in the context of pre training transformers, it is more like pre training with something like Google's JFT 300 million data set or the weakly labelled Billion Image Instagram data set that Facebook describes. These transformer models are being trained using a self-supervised learning task, which is based on massive quantities of unlabelled data that has been collected. One of the most significant distinctions between BERT and other techniques of pre-training transformer models is the utilisation of bi-directional context for language modelling in the BERT. Typically, when dealing with large amounts of unlabelled text such as Wikipedia data, the most common form of language modelling is to sequentially predict the next word in a left-to-right traversal or to do right-to-left traversal as well, and sometimes you would take this representation of going left to right and you would concatenate it with the representation of going right-to-left to form the representation for the word token.

Bi-directional encoding is named after Bert, who instead of masking intermediate tokens in the sequence, masks intermediate tokens in the sequence for the prediction job. Using Bert, we were able to pre-process this large unlabelled text dataset in preparation for the self-supervised by directional context masked token prediction challenge, which was completed successfully. Consequently, the pre-processing algorithm will sift through the text and the sequences of unlabelled data, and it will pick the word to be changed in 15 percent of the cases. It is anticipated that the masked token will be used in lieu of the word for 80 percent of the time under this approach. Furthermore, it should be noted that these words will be tokenized, with the word piece tokenizer being used in particular in Bert. If you're wondering about the distinction between word piece and tokens, it's similar to the difference between byte pair and encoding in computer science. To make it easier to fine-tune the model for downstream tasks, the chosen token is additionally substituted with a random word or the same word with corresponding probability of 10 percent when the input to the model is generated. The next sentence prediction task, in which a binary decision is made about whether sentence B follows sentence A, is one of the two tasks that Bert pre trains by performing. The first task is mass language modelling, which we just described as having the prediction of the mass tokens, and the second task is next sentence prediction, which is a binary decision about whether sentence B follows sentence A. This method of structuring the input makes it easier to fine-tune Bert for tasks such as question answering, where the input is formatted as a question, with sentence A representing the question and the paragraphs containing the answer to the question, with sentence B representing the

answer to the question. It's also helpful for fine-tuning jobs at the sentence level, when a classifier has taken up residence at the position at the special CLS shown in this illustration. In the pre-training job, the choice is made at this stage whether to do anything like sentiment analysis or spam detection, and then the tokens are tokenized using the word piece encoder, and the segmental embeddings are applied to the tokens. These segment embeddings indicate whether the sentence is a part of sentence A or sentence B for the next sentence prediction task, or, in the case of question answering, whether the sentence is a part of the question or the paragraphs holding the response for the next question answering task. A position embedding is also given to them, which indicates where they should appear in the sentence when it is read.

## 2. NLP's Most Serious Problems

Differences in the way people communicate because of language. You'll need to handle several languages if you're targeting an international or multicultural audience. In the US, the majority of people speak English. There are huge differences across languages in vocabulary, but there are also vast differences in phrasing, intonation, and cultural expectations. Use "universal" models to address this problem. For each new language, you will, nevertheless, need some time spent retraining your system.

1. Data gathered during a training session. NLP is fundamentally about parsing and interpreting language in order to get a deeper understanding of it. A person needs spend years involved in a language to become proficient; even the greatest AI must spend time reading, listen to, and using a language. Training data determines how well an NLP system performs. The system will either learn the incorrect things or learn inefficiently if you supply it with dubious or poor data.
2. Using ambiguous language while writing. The meaning of ambiguous statements may be difficult to decipher even for humans. Strict interpretation of their statements may not provide a clear, succinct meaning. As a result, an NLP device is capable of searching for context that will aid it in understanding the phrase. It's possible the user may be prompted for further information.
3. Misspellings. When a word is misspelt, it's easy for us to comprehend the remainder of the phrase since we can readily connect it with its correctly spelt equivalent. Misspellings, on the other hand, may be more difficult to see for a computer. You'll need a natural language processing (NLP) technology that can spot frequent misspellings of terms before you can go on.
4. Biases that are hardwired into your brain. It's possible for NLP technologies to pick up on programmers' and data sets' biases. The usage of an NLP may exploit and/or perpetuate certain social prejudices, or it may benefit certain users at the expense of others depending on the application. In all circumstances and with all individuals, a system must function equally effectively.
5. Words that may imply different things to different people. There is no such thing as a flawless language, and almost every language has words that may signify different things depending on the situation. Someone asking "how are you?" will have a completely different objective than someone asking "how do I add the new credit card?" for instance. In order to distinguish between these expressions, context should be used by good natural language processing tools (NLP).
6. Words that may imply different things to different people. Your NLP system can't oversimplify the issue by understanding just one of the intents in certain phrases and queries. For instance, a consumer may instruct your chatbot, "I need cancelling my prior purchase and

updating my credit card on file." AI must be capable of recognising the difference between these two types of intents.

7. Uncertainty and false positives. When an NLP detects a term that should be intelligible and/or addressable but can't be adequately replied, it's considered a false positive. The idea is to create an NLP system that is aware of its own limits and can resolve ambiguity via the use of questions or prompts.
8. Keeping the discussion going in a group setting is important. Nowadays, a lot of contemporary NLP software relies on two-way communication. NLP AI must be able to keep the discussion flowing by asking follow-up questions to gather more information and guiding toward a solution whenever possible.

### 3. Working of BERT

Using Transformer, BERT learns the relationships between words or sub-words in a text via context. To start, Transformer has two mechanisms: an encoder that receives text entry and a decoder which generates a forecast for the job. Because BERT produces a language model, just the encoder technique is needed. Google has published a paper about Transformer's inner workings. Unlike directional models, which scan text from left to right or right to left, the Transformer encoder analyses the whole word sequence at once. So it's called bidirectional, but it's really non-directional. So the model can learn a word's context from its surrounds. The Transformer encoder is described in the chart below. a series of tokens embedded into vectors, then processed by a neural network. The result is a series of H-sized vectors, each corresponding to an incoming token of the same index.

Determining a prediction objective for language models is difficult. Many methods anticipate the following word in a series (e.g. "The kid arrived from \_\_\_"), limiting context learning. This is why BERT utilises two training methods:

#### LM Mask (MLM)

5% of the phrases in each series are substituted with [MASK] tokens before feeding BERT. The model then tries to estimate the actual amount of said masked words using the context given by the non-masked words. In technical terms, predicting the output words entails the following:

- Superimposing a classifying layer on the top of such encoder output.
- Input vectors are transformed into vocabulary dimensions via the embedding matrix.
- Using softmax to calculate each word's likelihood.

If we want to minimise your BERT's loss, you must only examine predictions for masked values and disregard those for unmasked terms. Thus, the model's convergence is slower than that of directional models, but this is more than compensated by the model's greater contextual sensitivity.

#### Prediction for the Next Sentence (NSP)

While learning how to predict whether the second statement in a pair corresponds to the next phrase in the original text, the model is fed couples of sentences as input. Half of the inputs are pairs, with the second sentence coming from the original text, and the other half from the corpus. Because of this, it's assumed that the second statement will be unrelated to the first.

### 4. Applications Of BERT

Despite the fact that BERT adds a tiny layer to the basic model, it may be utilised for a broad range of linguistic activities.

1. It's possible to do sentiment analysis by putting a classifying layer of the Transformer's output and then classifying the results.

2. A query about a text sequence is sent to the programme, and it responds by marking the correct response in the sequence. An answer model for Q&A may be trained using BERT using two additional vectors that indicate the start and finish of an answering response.
3. Using Named Entity Recognition (NER), computer programme is given a text sequence and asked to identify the entities inside it. By sending each token's output vector into a classification layer, a NER model may be trained using BERT.

**5. Results and Discussion :-**The following screenshot shows the result of the Question answering system developed using the BERT architecture in python language on the pdf files related to agricultural drought and the relevant output received for the queries is given below. Thus, from the below pictures it is quite obvious that BERT has proved to be a boon to NLP systems.

```

[13] query='what are the indicators of drought?'
prediction=cdqa_pipeline.predict(query,2)

[14] prediction

[['rainfall, soilmoisture, vegetation index and hydrological indices',
 'The Times Of India - Mumbai _ 03_07_2018 _ 6',
 'The revised manual also made changes in the indicators--rainfall, soilmoisture, vegetation index and hydrological
 15.212142274216312),
 ('rainfall andground verification',
 'The Times Of India - Mumbai _ 23_12_2017 _ 7',
 'Central government officials say the new manual has been prepared in linewith international practice, and in such
 18.614469877370864]]
    
```

Fig1. BERT Result showing prediction to question “What are the indicators of drought?”

```

[17] query='what are the fund and scheme given for farmers affected by drought'
prediction=cdqa_pipeline.predict(query,3)
prediction

[['statedisaster relief fund or the national disaster relief fund',
 'The Times Of India - Mumbai _ 06_12_2017 _ 8',
 'The state cabinet has given its nod to conduct inspections of affected area.Compensation will be given to the farmers either through through statedisaster relief f
 18.76184429197614),
 ('National Disaster Relief fund',
 'The Times Of India - Mumbai _ 15_02_2019 _ 8',
 'During drought, farmers are compensated for crop loss through theCentre's National Disaster Relief Fund (NDRF) and through claims underPMFBY. The state may announ
 12.3650598480813),
 ('National Disaster Relief Scheme',
 'The Times Of India - Mumbai _ 04_03_2018 _ 8',
 'The state has applied for Central assistance of Rs 2,425 crore underthe National Disaster Relief Scheme for farmers affected by the pinkbollsawm and cyclone Ockhi.
 12.84804236790942),
 ('Disagreement',
 'The Times Of India - Mumbai _ 11_12_2018 _ 3',
 'Maharashtra has declared drought in 351 tehsils or 458 tehsils of the state.As many as 82 lakh farmers have been affected by drought, said thegovernment.',
 11.751770491873444),
 ('Maharashtra's government has a state disaster relief fund',
 'The Times Of India - Mumbai _ 23_12_2017 _ 7',
 'The union government has brought out a new manual for droughtmanagement that absolves the Centre of any liability in case of a 'moderate'drought. The state will h
 19.22977598308482]]
    
```

Fig2. BERT Result showing prediction to question “What are the fund and scheme given for farmers affected by drought?”

```

query='what are the consequence or effects of drought'
prediction=cdqa_pipeline.predict(query,3)
prediction

[['increases in suicide rates',
 'The Times Of India - Mumbai _ 12_01_2020 _ 7',
 'Mumbai-based psychiatrist Harish Shetty said the government needs toexpand pro-poor policies. "The increases in su
 8.566149296533709),
 ('suicides',
 'The Times Of India - Mumbai _ 15_01_2019 _ 5',
 'Despite farmers from Jalna district of Marathwada reeling under the effects ofa drought and suicides occurring wit
 7.814093017150871),
 ('adverse effects',
 'The Times Of India - Mumbai _ 20_12_2018 _ 14',
 'All sectors of the economy are interrelated. Any durable solution to agrariancrises requires labour intensive indu
 7.600836316933023]]
    
```

Fig3. BERT Result showing prediction to question “What are the consequence or effects of drought?”

**6. Conclusion :-**Without a question, BERT represents a significant step forward in the application of machine learning to Natural Language Processing. A broad variety of practical applications will be possible in the future due to its approachability and rapid fine-tuning. We have also seen from the results how efficiently we can build a question answering system using BERT.



**7. Future Scope :-** Though this article could not demonstrate all the applications of BERT but it made us understand how BERT proved to overcome the challenges of NLP. Thus, the article gives the further scope of its application in text classification and many more NLP systems.

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## **A study to assess the effectiveness of structured teaching programme on the knowledge and practice of post natal mothers regarding breast feeding technique in selected hospital, Indore, M.P.**

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**ABSTRACT:-**Breastfeeding forms the best food for the new born immediately after birth and to be followed for a continuous two years. According to WHO global strategy for infant and young child feeding malnutrition has been responsible directly or indirectly for 60% of the 10.9 million deaths annually among children under five. Pre-test was done to assess the knowledge of the subjects by using structured interview schedule. The Structured teaching method was given with the help of flash cards, charts. The investigator assessed the ability regarding breastfeeding technique by using observation checklist. Post-test was conducted on the sixth day with the same interview schedule and observation checklist. The collected data were analyzed by using descriptive and inferential statistics. It was found that the pre-test and post-test knowledge scores of postnatal mothers shows that the 18(30%) had average score, 30(50%) had poor score, 12(20%) had good score none was in excellent score. After the administration of STP through the post test score of the postnatal mothers were 18(30%) were in good score, 36(60%) were in excellent and average score 6(10%) among the sample. Study revealed that there was a significant relationship between knowledge and practice of post natal mothers.

**Keywords:** Knowledge, Practice, Post Natal Mothers, Hospital

**INTRODUCTION:-**Breastfeeding is the natural way of providing nutrients to young infants for the healthy growth and development. All mothers can breastfeed with correct information and the support of their family. Breastfeeding is the best food for the new born immediately after birth and to be followed for a continuous two years. Exclusive breastfeeding is proposed up to 6 months of age. Postnatal mothers play a vital role in lactation and infant feeding. Breast-feeding is worthy for new mothers as well as for their babies. No need to sterilize the bottle and no need to buy the mixture. A nursing mother easily loses the weight of pregnancy and lactation also stimulates the uterus to contract back to its original size. Typically a post natal in rural areas, especially in states of Madhya Pradesh is at very low level of literacy. Therefore there is a need to help these women perform their role efficiently in spite of their literacy level to deliver care to their children. Post natal mothers support new mothers on the early establishment of breastfeeding, the feeding of colostrums and the recognition of breast feeding problems. Therefore, it is important for the post natal mothers to have adequate scientific knowledge about infant breastfeeding. The present study therefore is undertaken to assess the effectiveness of teaching programme in relation to breast feeding so that post natal mothers can provide proper breast feeding for their infants. To create a well-trained postnatal mother of Infant and Young Child Feeding Practices, it is essential to have a good knowledge and practice regarding breast feeding. Postnatal mothers will further disseminate the message at other young mothers in villager and small towns, etc. They educate and support new mothers on the early establishment of breastfeeding, the feeding of colostrums and the recognition of breast feeding problems. Main work of postnatal mother is to educate about breastfeeding and provide them knowledge regarding its importance for themselves and child. Therefore, it is important for postnatal mothers to have adequate scientific knowledge about infant breastfeeding. Postnatal mothers can

also play a vital role in promotion breast feeding among new mothers because they are the persons who are directly linked to the families and local community. Recent government survey suggested that the postnatal mothers have positive attitude towards breast feeding but their knowledge is inadequate. It is also revealed that they are having incomplete knowledge and misconceptions regarding breast feeding.

#### REVIEW LITERATURE

**Davis. Adetugbo (2016)** conducted a study to assess the effectiveness of a breast feeding educational programme launched through the primary health care programme in the rural Nigeria. The result showed marked improvement in the interventional groups, colostrum feeding ( $p=0.001$ ) 31.6% of the mothers in the interventional group practiced timely initiation of breast feeding compared to only 5.6% of control group and the prevalence of exclusive breast feeding at 6 months was 39.8% in interventional group compared to 13.9% for the control group. Educational programme is significantly effective ( $p=0.001$ ) for improvement in the knowledge, attitude and practice regarding breast feeding.

**Sharma, Deeksha, (2016)**, was conducted a study to assess the status of infant and young child feeding practices. The study was conducted in both rural and urban areas of PauriGarhwal. 48% of the AWWs were of the opinion that mother should breast fed her child for more than 24 months, while 26% of the AWWs were advocating breast feeding for 24 months. Some AWWs were also advocating breast feeding for 13-23 or up to 12 months of age.

**Maheshwari. R.K (2015)** was conducted a study to assess the knowledge and practice toward infant feeding among rural health personnel as nurses and dais at Moradabad who provided maternal and child health services in rural areas. A total no. of samples 35 nurses and 25 dais were included in the study. The health services were not fully aware about the proper infant feeding practices. Almost 17.5% of these respondents advised that breast feeding should be stopped by 1 year of age and 75.1% advised the use of diluted milk as supplementary feeding. These inappropriate suggestions to an illiterate rural population could be disastrous. The study highlights the needs for continuing medical education and for the stepping up of paediatric training in undergraduate course work in this area.

**Chaudhary. R.N, et al, (2014)**, conducted a study to assess the knowledge and practice of mothers regarding breast feeding. It was a cross-sectional study carried out on 200 mothers of under 1 year old children's who attending pediatric outpatient department, well baby clinic and immunization clinic at BPKIHS, Dharan. Mothers were interviewed using pre-designed questionnaire. The maternal knowledge towards breast feeding was inadequate and there was a big gap between actual and desired practice.

**Saudan Singh, (2013)**, conducted the study on knowledge and attitude of postnatal mothers regarding breast feeding at communities of Kanpur. 85 participants were included in the study 95.7% postnatal mothers had the correct knowledge that breast feeding should be started immediately after birth. Majority (90.7%) of postnatal mother's favored giving colostrum to the child. 43% postnatal mothers had wrong knowledge that top milk given to child should be diluted. These findings suggest there is need of educating the postnatal mothers about the functionaries on the continuation of breast feeding during diseases.

**Bobhate, PrateekSudhakar, (2012)**, was conducted a study on breast feeding Practices and Factors Associated with it: A Cross Sectional Study among Tribal Women in Khardi Primary Health Centre, Thane, India. The practice of withholding the breast milk after birth, discarding valuable colostrum and giving pre-lacteal feeds to the new born needs to be urgently addressed through programs and breast feeding intervention, education and counseling for antenatal women

with active involvement of ASHA/AWW/ANM regarding timely initiation of breast feeding following delivery, duration of exclusive breast feeding and importance of feeding colostrum is needed.

**Bhasin SK, et al, (2011)**, conducted the study on knowledge and attitude of postnatal workers regarding breast feeding. 83 postnatal mothers in the ICDS project participated in a survey which was designed to assess their knowledge and attitude about breast feeding and to identify gaps in their knowledge of breast feeding. The findings indicated a need for educating postnatal mothers about continuation of breast feeding during diseases.

**Davies.A.A. (2010 )** conducted a study to assess the effectiveness of training programme to promote exclusive breast feeding in rural communities of Nigeria. A workshop for the trainers was organized. Initiation of breast feeding within half hour of delivery was reported for 32% of deliveries in the intervention group compared with only 6% in the control group. Hence, the training program is significantly effective for improvement in the knowledge regarding early initiation and exclusive breast feeding ( $p < 0.001$ ) and appropriate education of health extension workers can therefore, contribute significantly to the promotion of breast feeding in rural communities.

### RESEARCH MEHODOLOGY

**RESEARCH APPROACH :-**In this study evaluative approach was used to assess the effectiveness of structured teaching programme on the knowledge and practice of post natal mothers regarding breast feeding technique.

**RESEARCH DESIGN:-**In this present study the researcher adopted a pre - experimental (one group pre -test post – research design). One group pre –posttest design provides comparison between a group of subjects before and after the experimental treatment.

The design can be represented as:

**E = O<sub>1</sub> → X → O<sub>2</sub> →**

**One group Pre-test- Post Test experimental design**

**Key:-**

E:Pre Experimental Research design

O<sub>1</sub>:Pre-test knowledge of postnatal mothers regarding breastfeeding technique

X:Structured teaching method.

O<sub>2</sub>:Post-test knowledge of postnatal mothers

### VARIABLES

**Independent Variable :-** In this study the independent variables is the structured teaching programme in breast feeding.

**Dependent variable: -** In this study dependent variable is knowledge & practice regarding breast feeding among postnatal mother.

**SETTING:-**The present study was conducted at Christian Hospital, Indore.

### THE POPULATION

**Target Population:-**Postnatal mothers who have children less than six weeks of age

**Accessible Population :-**Accessible Population is the postnatal mothers who are willing to participate in the study in rural areas of Indore.

### THE SAMPLE & SAMPLE SELECTION CRITERIA

In the present study the sample comprises of 60 postnatal mothers.

### SAMPLING TECHNIQUE

In present study the samples were selected through a non -probability convenient sampling technique.

**CERITERIA FOR THE SELECTION OF THE SAMPLES**

**Inclusion Criteria**

- Post-natal mother those are living in selected hospital.
- Post natal mothers who are willing to participate in the study.

**Exclusion Criteria:** Post natal mothers who are not willing to participate in the study.

**DATA ANALYSIS AND INTERPRETATION**

Analysis and Interpretation of data was done by using descriptive and inferential statistics based on the objective of the study and hypothesis to be tested.

**TABLE: Effectiveness of STP by calculating Mean, SD, Mean Difference and ‘t’ Value of Pre-test and Post-test knowledge**

Knowledge score	Mean ( $\bar{X}$ )	S. D. (s)	Std. Error of Mean	D. F.	t-value	Significance
Pre-test	12.54	6.56	0.789	49	23.564	P<0.0001*
Post-test	26.85	8.21				

When the mean and SD of pre -test and post-test were compared and ‘t’ test was applied. It can be clearly seen that the ‘t’ value was 23.564 and p value was 0.0001 which clearly show that planned teaching programme was very effective to increasing the knowledge of breastfeeding technique among postnatal mothers.

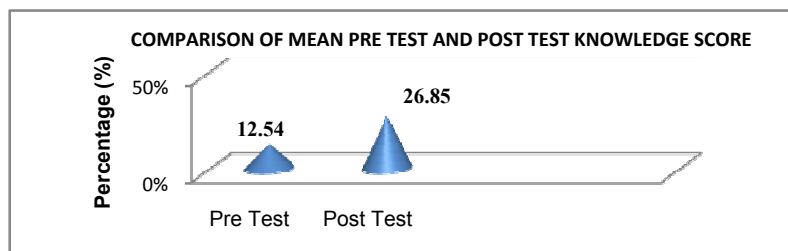


Figure: Cone diagram showing comparison of mean pre-test and posttest knowledge score

**Table: Comparison of pretest and posttest practice score**

	Mean ±SD	‘t’ Value	P value
Pre test	3.83 ± 0.38	-34.720, df = 39	0.000*
Post test	9.85 ± 1.08		

**Paired ‘t’ test applied P value = 0.001, Significant**

The above table shows the comparison of mean pre-test and post-test practice score. The mean pre -test practice score was 3.83± 0.38, while the posttest practice score was 9.85 ± 1.08. The difference was found to be statistically significant (p=0.001), showing a higher mean posttest practice score in comparison to the pretest practice score.

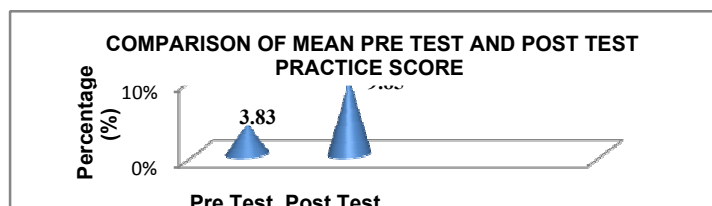


Figure: Cone diagram showing comparison of mean pre-test and posttest practice score

**RESULTS AND DISCUSSIONS:-**It was found that the pre-test and post-test knowledge scores of postnatal mothers shows that the 18(30%) had average score, 30(50%) had poor score, 12(20%) had good score none was in excellent score. After the administration of STP through the post test score of the postnatal mothers were 18(30%) were in good score, 36(60%) were in excellent and average score 6(10%) among the sample. The mean and SD of pre -test and post -test were compared and 't' test was applied. It can be clearly seen that the 't' value was 23.564 and p value was 0.0001 which clearly show that planned teaching programme was very effective to increasing the knowledge of breastfeeding technique among postnatal mothers. The mean pre -test practice score was  $3.83 \pm 0.38$ , while the posttest practice score was  $9.85 \pm 1.08$ . The difference was found to be statistically significant ( $p=0.001$ ), showing a higher mean posttest practice score in comparison to the pretest practice score.

**CONCLUSION:-**Findings of the study showed that the knowledge and ability scores of postnatal mothers were less before the STP. STP facilitated them to learn to breastfeeding correctly, which is indicated by the post -test knowledge and ability scores. Study revealed that there was a significant relationship between knowledge and practice of post natal mothers. The nursing personnel are challenged to provide standard and quality nursing care. Hence there is a need for the nurse to take active part to restore the life of patients to maximize functional capacity.

**RECOMMENDATIONS:-**A similar study can be done on a large sample to validate and generalize the findings. A comparative study between urban and rural knowledge on parenting skill training on breastfeeding technique can be conducted.

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## IMPLEMENTING PROGRAMMABLE SEARCH FOR NEWS DATA ANALYSIS

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**Abstract:-**As information and data is fuel for today's world, getting information is not that easy, we have to rely on legitimate channels. There are few Social media giants who give data through API's. However, that data is not enough for a pan web analysis; the only way we can reach there is searching keywords in Search Engines. Few years back web crawling was available, however in recent past it is not an option as many companies raise objection and this can even result in blocking our IP. We are exploring available options to get data from sources which are authentic and pioneers in search algorithms. We have explored Google Programmable search and Bing search, which gives us desired results. We are getting data from these API's and processing for news weightage and opinion mining.

**Keywords:-**Google search, Bing search, Python, NLTK

**Introduction:-**As information and data is fuel for today's world, getting information is not that easy we have to rely on legitimate channels. Facebook, Twitter and Instagram are like Social media giants who give data through API's [6]. We can take data from this API and use it for our further analysis. However, that data is not enough for a pan web analysis, for example I want to check presence of SpaceX on today's news and any mentions in the world of WEB. The only way we can reach there is searching keywords in Search Engines. Years back there were efficient web crawlers which could go to webpages and could parse data. In recent years it is legally not permitted to do web crawling [1]. Search engine companies like Google and Microsoft (Bing) gives users programmable search options which will allow users to search keyword and get specific results. In this paper we are implementing python to search using programmable search engine and secure the data to an array to do further analysis of any kind. This is not a replacement of API data retrieval; this will help communications departments to find the presence of their organization in the google search with certain keywords of choice.

**Method:-**Google search engine is one which has the largest search index in the world, Bing and yahoo search, rally behind in the race. Google released this programmable search facility to include this library in the website to give search functionality for our particular webpage. As the branch of data analytics grown this meant to be a source of data collection. Python is a language majorly used in the data analytics industry which is in peer with R. Here the scenario which we are testing in this paper is domain of communication industry. For communication industry the most important measurements is reach in Newspapers discussion forums and social media. For social media we can get API of major portals, however for search presence we need to have to rely on Google search or Bing search.

**Steps to configure Google programmable search :-**Topical web search is a search API which google gives to search one single site or a set of sites according to our subject. For this context we have selected NEWS website as our need and we are configuring our custom search to retrieve data from these sites based on the keyword we query. First of all we have to create a project in console.developer.google.com and activate the API. Once the API is

activated we need to create credentials. First one is API key. Now we have to create a search engine at cse.google.com. In search engine, we can give list of websites API can search and bring results. As we are mainly targeting the communication domain of an organization, it is important to get NEWS presence. We have added 10 websites in the news channel to retrieve data from API. After giving the websites we want to search, the next credential is Search Engine ID, this also we need to query in the API.

**Python and Google research Colab as interface** :-We are using Google Colab (colab.research.google.com), this is web based analytics tool based on Python. This enables users to code in python, users don't have to load python software and its dependencies in the PC. It is freely available to everyone who does have a google account. We need to install Google API Python client library to access programmable search. We can use custom search method from this library to execute the search. Result of search will be in the Jason format, which we can store in an array for further analysis. This can be even pushed to a database or a csv file using python JSON libraries.

**News weightage Analysis** :-In our case primarily we will do a news weightage [10] analysis date wise, to understand the communication strategy a company implements performs. Performance of news of an organization can be measured of its presence in the websites. This can be announcement of Products, publishing of quarter financial results, exit and joining of employees and much other news even the communication department don't intend to release, like a fire in the factory, or loss of valuable because of a faulty product. Any of these cases a communication department has to know every pulses of an organization

#### Chart of weightage

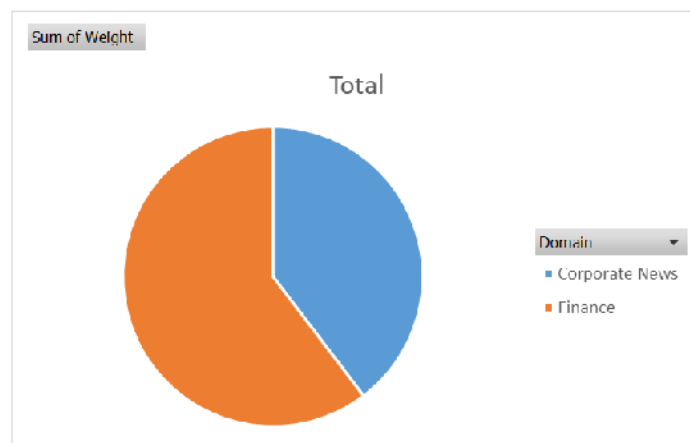
Domain	Website	Weightage 0-5 scale	Weightage for Positive Sentiment	Weightage for Negative Sentiment
Finance	Moneycontrol.com	4	1	-2
Finance	Cnbctv18.com	3	1	-2
Finance	Businessworld.in	4	1	-2
Finance	Financialexpress.com	4	1	-2
Finance	Thehindubusinessline.com	4	1	-2
Finance	Thehindu.com	2	1	-2
Finance	Business-standard.com	3	1	-2
Finance	Livemint.com	3	1	-2
Finance	Economictimes.com	5	1	-2
Finance	Timesofindia.com	2	1	-2
Corporate News	Moneycontrol.com	4	1	-2
Corporate News	Cnbctv18.com	2	1	-2
Corporate News	Businessworld.in	2	1	-2
Corporate News	Financialexpress.com	4	1	-2
Corporate News	Thehindubusinessline.com	3	1	-2
Corporate News	Thehindu.com	4	1	-2
Corporate News	Business-standard.com	3	1	-2
Corporate News	Livemint.com	2	1	-2
Corporate News	Economictimes.com	1	1	-2
Corporate News	Timesofindia.com	3	1	-2

Data which we store in the array is then computed with the presence and date of which the news has come and store in a database for further analysis of data wise, month wise and year wise analysis.

**Summary Results of presence weightage computation** :-Weightage is computed date wise and stored in a database table with Date, Domain, web portal, weightage and score.

Communication department has another data which has domain wise campaigns, organizations have done or the date wise events which is not generated from communication

department. Few events are more important for a data analyst such as counter communication for an event like a product failure, or for a stock value fluctuation in the market. Counter communication is an important event which can boost the brand confidence. Here comes the importance of opinion mining the articles and the heading of NEWS. In this papers scope we are doing opinion mining of news titles as it is a parameter which needs to be read together with the presence



**Pie chart for News presence domain wise**

**Opinion Mining of News Headlines:-**Opinion mining is a revolutionary concept which changed the world of communication industry as any output of a department can be measured with the outcome and even can predict the outcome from the opinions of users and the professional journalists who interpret a subject. As we have already analyzed the weightage of news presence, it is now important to know the opinion / Sentiments of the news presence for the communication department to decide further communication for an event. Opinion is a very contextual, it has majorly four parts the Holder, Target, Content and Context. Opinion of an organization may be different from the product for e.g., MacAfee is a very good product which saves us from computer viruses, however the organization which made this product have gone through many ups and downs in opinion. Similar examples we can quote with Tata. Tata as an organization has the best value, but few of their products like cars at the initial stages had negative sentiments because of its quality. This may happen even for a news headline hence the opinion is largely based on context, when there is a reciprocal communication regarding the steps organization has taken to solve; this opinion may change to positive like recall of cars. When a part of the product is at fault, soon the opinions of the product goes negative, however after the communication department addresses and announce, the issue will be handled by company free of cost with an announcement of recall. The Opinion changes as users have an assurance from the company.

**Textblob and NLK Library:-**For opinion we are using Textblob library and NLTK using python which is used to process textual data, and it is capable of doing all NLP tasks like parts of speech tagging and sentiment analysis and many other NLP based tasks, though there are many complex libraries in the scope of this research we are using this, as we would like this paper to be understood by anyone and everyone. Using these libraries, we are going to measure polarity of statement whether it is positive, negative or neutral [9] and it does have the score of this also.

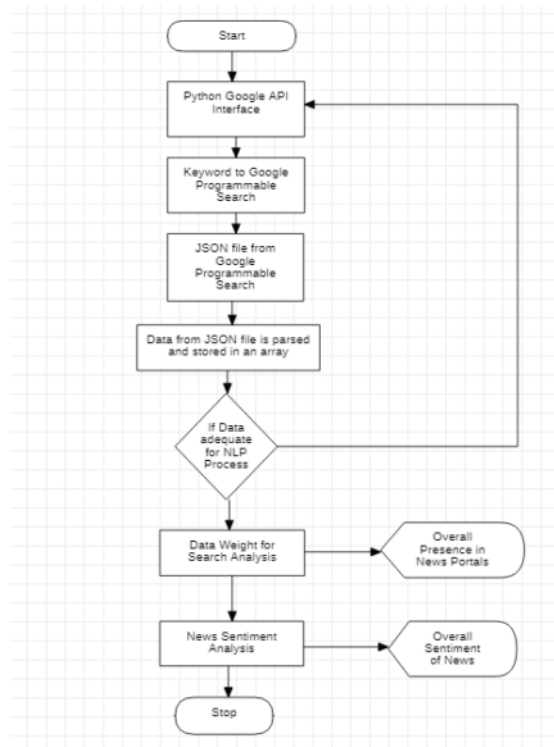
We compared Textblob and NLTK library for opinion mining of news headlines, we got better results with NLTK. To narrate an example if a company has got an ISO certification textblob library gives polarity as 0 which is neutral and polarity as 0 which means this library is not able to analyze getting an ISO certification is positive news for an organization. In

NLTK it gave an indication towards positive, as the headline description is very short and precise an inclination towards positive we considered as positive news.

**Process we did with NLTK library and its results :-**We have selected NLTK library to get opinion on the news headlines as we found this library is optimized for News headlines. As mentioned in the process flow chart, we first searched live data for a certain keyword, and fetched data (PS 1:1), then we have saved this data to a multidimensional array in python. We imported all needed dependencies like NLTKsentiment Vader and Vader lexicon dictionary to do opinion mining. As the news headlines are not very descriptive we found indications to positive shall be taken as 1 and indication to negative to be considered as -2. Impact of a negative news has more impact than a positive news. For data population and final result, we used excel. We used research collaboration tool which google provides to test process flow.

Date	Domain	Website	Presence	Weight	Sentiment	S Weight
1/1/2021	Finance	Moneycontrol.com	1	4	1	4
1/1/2021	Finance	Cnbctv18.com	1	3	1	3
1/1/2021	Finance	Businessworld.in	1	4	1	4
1/1/2021	Finance	Financialexpress.com	1	4	-2	-8

### Process Flow Chart



### Process Result Visualization

**PS 1:1**

```

Structured data: https://www.business-standard.com/content/press-releases-ani/kuvera-receives-iso-27001-2013-certification-121081301474_1.html
ogType: article
twitterCard: summary_large_image
ogImageHeight: 1000
ogImageSecured: https://s-media-cache-ak.vip/business-standard.com/_media/bimg/article/2021-08-13/20210813124927.jpg
twitterAppImagePhone: Business Standard for iPhone
website: https://www.business-standard.com
twitterSite: @bsindia
author: ANI Press Release
summaryKeywords: Cause: Rastogi, risk analysis and mitigation, data asset classification
ogDescription: Mumbai, Maharashtra [India], August 13 (ANI/NewsViva) India's fastest growing online investment platform Kuvera is today announced that it has received the International Organization for Standardization (ISO) 27001:2013 certification for its
ogImage: https://s-media-cache-ak.vip/business-standard.com/_media/bimg/article/2021-08-13/20210813124927.jpg
twitterImageSrc: https://s-media-cache-ak.vip/business-standard.com/_media/bimg/article/2021-08-13/20210813124927.jpg
twitterAppImagePad: https://itunes.apple.com/au/app/business-standard/id442953299?m=1&mt=8
viewport: width=device-width, initial-scale=1.0, maximum-scale=1.0, minimum-scale=0.9
twitterDescription: Mumbai (Maharashtra) [India], August 13 (ANI/NewsViva) India's fastest growing online investment platform Kuvera is today announced that it has received the International Organization for Standardization (ISO) 27001:2013 certification for its
ogId: https://www.business-standard.com/content/press-releases-ani/kuvera-receives-iso-27001-2013-certification
                    
```

**PS 1:2**

```

[] import nltk.sentiment.vader
nltk.downloader.download('vader_lexicon')

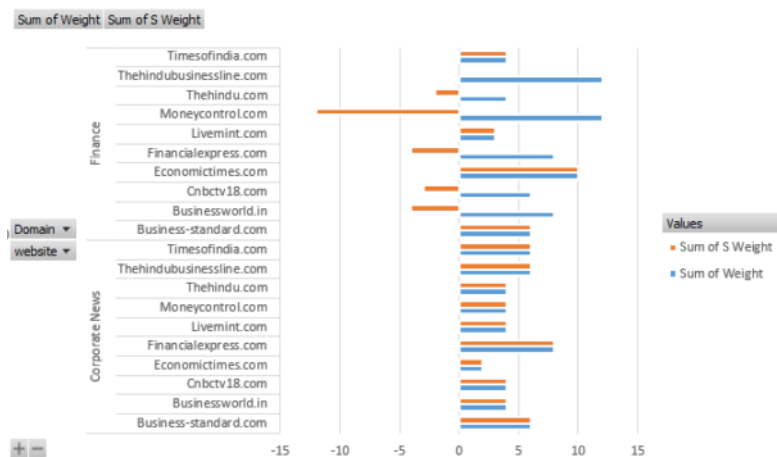
[nltk_data] Downloading package vader_lexicon to /root/nltk_data...
True

[] from nltk.sentiment.vader import SentimentIntensityAnalyzer as SIA

[] sia=SIA()
pol_score = sia.polarity_scores(line)
print(pol_score)

{'neg': 0.0, 'neu': 0.943, 'pos': 0.057, 'compound': 0.1779}
                    
```

### Result of Final Analysis



**Conclusion:-**We did a simple but end to end representation of how data can be collected for a keyword by using a search API, do a weightage of presence and opinion mining of the news titles. Our scope of research was limited to activities of a communication department's activities, which is the most important as they are the face of the company. As our research find path to both weightage and opinion, there is a future of further research to analyze the whole news article and understand the subjects and get opinion out of it. In our opinion there will be opportunities for organization to create domain wise libraries which better defines the domain and can get better subjective analysis. Also can explore tensor flow for further research.

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## ANALYSIS AND SIMULATION OF ELECTROMAGNETIC INTERFERENCE(EMI) EFFECT ON READ OUT WIRELESS PRESSURE SENSOR USING PYTHON

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**Abstract:** Read out LC resonance based wireless pressure sensor are widely used in the smart grid circuit breaker system due to its reliable remote measurement and control. The occurrence of EMI emission from the interconnected electronic devices to the pressure sensor has unfavourable effects on the accuracy of data reading from the sensor. The analysis of EMI effect and its suppression plays very important role in the design of sensor system. The EMI may lead to inconsistent measurement of pressure from the sensor and causes malfunctioning of the circuit breaker. This paper mainly describes the analysis on the effect of EMI on the resonance frequency of the pressure sensor and deviation of the pressure measurement through the simulation using python programming language.

**Keywords:-**Electromagnetic interference (EMI ), Op -Amp, Resonance frequency, Pressure sensor.

**1. Introduction :-**In the switch gear system, especially the wireless pressure sensor which is connected to the circuit breaker will be functioning in the harsh environment. (Zhang et al., 2014)has tested and designed a feasible and efficient inductor and cavity LC resonant wireless pressure sensor with high temperature co-fired ceramic (HTCC) technology basedwire less pressure sensor which are used in the harsh environment. Apart from the sensor basic circuit, the entire unit of sensoralso consistsof readout antenna, mixer, analog -digital converter, microprocessor unit with USB interface. (Hosticka, 2007)The analog circuit will have main role in the sensor signal acquisition, conditioning and conversion, bias and reference voltage and currents. (Richelli, 2016) The most familiar interface of sensor system is sensor control circuits, clock signal, signal conditioning, conversion circuits are embedded on the single chip.

(Richelli, 2016) The main concern in the sensor is the contribution of noise by itself and by interfaced circuits which can enter the system through stray capacitance or through conductive or through inductive and power supply but these things are addressed by many reduction techniques and guide lines. When all the analog and digital circuits are integrated on a single platform the immunity towards the EMI plays very important role in designing of the sensor system.

**2.The Sensor system block diagram and pressure sensor circuit model** -The block diagram as shown in figure -1 depicts the readout wireless pressure sensor system designed by(Zhang et al., 2014).The main blocks of system units are Read out wireless pressuresensor,analog mixer,Analog -Digital converter (ADC), Microprocessor, USB interface to the PC.

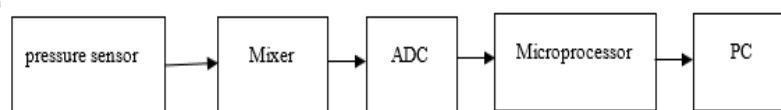


Figure-1 Block diagram of Read Wireless Pressure Sensor System.

The pressure sensor parameters are inductorcoupling, reader antenna, capacitor and the



internal resistance. The equivalent electrical circuit of readout LC passive pressure sensor is as shown in figure -2. The ‘L1’ and ‘L2’ are coupled inductors, ‘C1’ is the capacitance of antenna, ‘C2’ is pressure dependent capacitance, ‘R1’ and ‘R2’ act as internal resistance of reader antenna and ‘L2C2’ resonance circuit respectively. As ‘L1’ and ‘L2’ are coupled inductors which exhibits the mutual inductance ‘M’ between them.

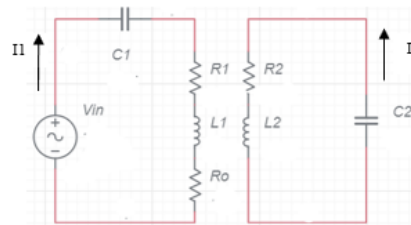


Figure-2 Equivalent circuit of pressure sensor.

Mathematical Model:

$$\begin{bmatrix} (R1 + j\omega L1 + \frac{1}{j\omega C1} + Ro) & j\omega M \\ j\omega M & (R1 + j\omega L2 + \frac{1}{j\omega C2}) \end{bmatrix} \times \begin{bmatrix} I1 \\ I2 \end{bmatrix} = \begin{bmatrix} Vin \\ 0 \end{bmatrix} \text{----- (1)}$$

From the above equation voltage across ‘Ro’ can be obtained as

$$Vo = \frac{Ro \times Vin}{\left[ \left( R1 + j\omega L1 + \frac{1}{j\omega C1} + Ro \right) \times \left( R1 + j\omega L2 + \frac{1}{j\omega C2} \right) \right] - (j\omega M)^2} \text{----- (2)}$$

From equation (2) it is evident that as pressure varies, capacitance ‘C2’ also varies and the pressure sensor gives the pressure values in terms of voltage ‘Vo’ across ‘Ro’. Therefore the output voltage function of pressure dependent capacitance ‘C2’.

**3.Simulation of pressure sensor circuit model:-**The Mathematical model is simulated using the PYTHON with the system parameters as mentioned by (Zhang et al., 2014). The figure-3 shows the simulated result and has been compared with the result obtained by “Zhang”. As stated in the previous section the output voltage is depend on the pressure capacitance.

(Zhang et al., 2014) At zero pressure i.e., at resonance the capacitance ‘C2’ will be 20pF and voltage is nearly equal to zero or minimum. From the graph (see figure-3) it can be observed that the at ‘C2=20pF’ the voltage of the sensor is minimum (0.047V). As the pressure is the function of capacitance ‘C2’ the output voltage varies according to variation in the ‘C2’ value.

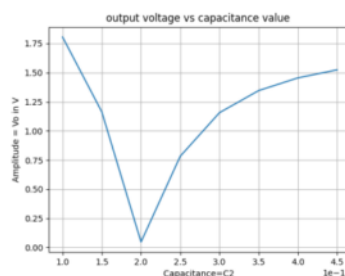


Figure-3 Variation of output voltage ‘Vo’ Vs Capacitance ‘C2’

#### 4. EMI Issues in pressure sensor system

**(Diagram et al., 2003)** The mixer has susceptibility to the interference from radio and TV stations. If proper circuit layout is not considered then it leads to formation of stray capacitance and lead inductance. This in turn give rise to the error in the resonant circuit behaviour of peak voltage or oscillation and sometimes both. **(Maćkowski & Skoroniak, 2009)** The code saved in program memory of the microcontroller emits the EMI both in conduction and radiation. The different instruction of program executed by the processor will lead to different emission level. **(Kennedy et al., 2018)** The ADC is an interface between analog and digital area. It is usual that the sensor signals are disturbed by the external EMI and disturbs the normal functioning the sensor. EMI can be conducted or radiated and it can be from inside or outside of the system. The most important device in the digital signal processing is ADC. The RF source give rise to the EMI to the ADC. **(Fiori, 2016)** It is observed that from the EMC report the sensor signal and the output are disturbed by the EMI and with interconnected devices and its interference signal.

**(Richelli, 2016)** The EMI problem is mainly occurring in the front end of analog circuits, especially in Op -Amps. The offset voltage produced by EMI for some of the Op -Amps are usually varies from 200mV to 650mV and EMI frequency from 0.1MHz to 3GHz depending the transistor technology used in Op -Amp design. The slew rate symmetry and unbalance stray capacitance will lead to distortion at the input of Op -Amp at low and high frequency level beyond the bandwidth.

#### 5. Simulation of pressure sensor circuit model with the presence of EMI frequency

From the literature, it is evident that EMI signal will appear at the front end of Op -Amps. From the block diagram of sensor system, we can observe that the mixer which is connected to the sensor is made up of Op -amps and these are connected to the sensor output terminal. The EMI signal at the front end definitely effect the output voltage of the readout and resonance circuit of the sensor through the conduction and/or through radiation of EMI signal. The lower EMI signal can affect the sensor due to the coupling.

**(Voon et al., 2003)** The EMI penetration can be calculated as follows

$$\delta = \sqrt{\frac{2}{\mu\omega\sigma}} \text{ -----(3)}$$

Where  $\sigma$ = conductivity of the material,  $\omega=2\pi f$ ,  $\mu$ = permeability of the conducting material

The electric and magnetic far field are given by the equation

$$E_{\text{far}} = \frac{377I}{2\lambda r} \text{ -----(4)}$$

$$H_{\text{far}} = \frac{\omega^2 a^2 \mu I}{1508Cr} \text{ -----(5)}$$

Where I= current in the EMI source, l= distance of field measurement,  $\lambda$  = radiation wave length, c= speed of light, a= area of the field.

The effect of EMI on pressure sensor output is simulated according to the superposition principle of two signal with variable frequency using PYTHON. It can be observed that there is a change in the actual output voltage as shown in the figure -4. At resonance the output voltage is increased to 0.52V as compared to figure-3 resonance voltage of 0.047V and also

exhibits the deviation in the actual pressure measurement. As the voltage is electrical signal in terms of pressure, which leads in the error in actual measurement of pressure.

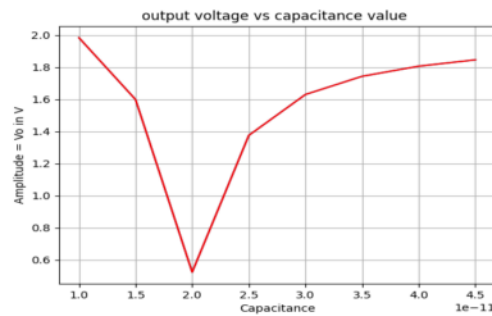


Figure - 4 Variation of output voltage 'Vo' V/s Capacitance 'C2' with EMI.

**6. Conclusion :-**This paper presents the relevant linear approach of simulation using PYTHON for the readout wireless pressure sensor and the electromagnetic interference effect on the output voltage, when connected to the signal conditioning circuits. Due to the passive components of the sensor and the integration of analog circuits, the effect of EMI and its analysis on basic sensor plays major role in the design of the pressure sensor and its interconnected circuits. The analysis is done on the two scenarios **(a)** Response of pressure sensor without EMI and **(b)** Response of pressure sensor with EMI. From the result we can conclude that the analysis of susceptibility of pressure sensor towards the EMI and the elimination of EMI is very much essential in integration of sensor in the signal conditioning and monitoring system.

**7. Future work:-**The analysis of pressure sensor susceptibility towards EMI by nonlinear methods and designing EMI filter/shielding at the sensor basic circuit as per Electromagnetic compatibility (EMC) Standards.

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## Video Piracy with Copyright Prevention using RC4

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**Abstract:**-In this system, we propose a methodology to deal with the upcoming techniques for user behavior based adaptive mobile video services, like video sharing on social media before sharing we have to take care of those videos which are secure and not edited with nasty content for uploading on socially and will be small size and required less storage on the cloud. We are using Modified RC4 Algorithm, Rate Control Algorithm, and Hybrid Deep Learning algorithm to develop the system.

**Keywords:**-AMoV, ESoV, VSN, RC4, CNN

### 1. Introduction

Every day lots of people are uploading videos on social media like YouTube, Facebook, etc. typically solo videos, threatening videos are uploaded which is not good to see as we know about the latest technologies that are trendy in the market for videos we must say it. With the video, we can do some extra operations such as video editing, video compression, video sharing, etc. With a deep study of these parameters, we tend to across that some papers are already got created a study concerning this. The vehicular social networks (VSNs) numerous sorts of services like traffic management, road safety, and sharing data (videos, audios, and roads photos, air quality, and so on). However, its complicated, large-scale and dynamic network structure poses new security challenges. Among these challenges, secure data transmission has turned to be a spotlight. Some papers have studied this downside and take a look at to mitigate it with analysis on the new appropriate technique. Kai Fan has been designed a system VSN supported the CP-ABE and blockchain, this method supports data revocation once a vehicular user no longer wants to share the data on the cloud; the system is time-consuming. Thus a large amount of data video requires a large time to upload to the social networking website or at a cloud server. The video should be compressed to minimum data storage. After compressing the video, we tend to upload the video to the cloud there may well be possibilities that the video might exist already, this video is termed as pirated video. This could be avoided for this a system was developed that proposes an algorithm the paper studied a TIRI-DCT algorithm based on the fingerprint of each image of the video content that reflects 98.7% accuracy whereas considering security concern level the algorithm decreases its performance and thus copyright of the video content could not able to complete. Therefore for this purpose Hybrid deep learning may be the higher choice.

### 2. Objective

- Secure approach for video sharing using modified RC4 and OTP authentication within the mobile network.
- Implementation of compressed video sharing by using a rate control algorithm.
- Detection of video editing by using a hybrid deep learning algorithm.
- Duplicate video copy detection to save storage space and avoid Copyright issues.

### 3. Hypothesis

The proposed framework proposes an overhauled modified RC4 calculation for video sharing verification by utilizing this calculation. We will safely be sharing video anywhere. Video sharing is obtaining secured with this calculation, we tend to in addition as sharing giant estimates of video on social media may well be an exceptionally extreme and time-devouring errand for each client for this reason we glance the varied strategy for compress the video estimate in an exceedingly touch of storage and additionally we are working on duplicate video detection for social media sites where some videos are already existed by their

owner. We are utilizing rate control calculation for video compression. But to begin with, we are going to ponder the most points of view of the think about. We are centering on the taking after purposes:

### 1. Unauthorized video sharing on social media

Every day an infinite number of videos are uploaded on social media some of them are not good to see for society, children, etc.

### 2. metadata videos are posted online

Many videos are posted online are trendy things for the entertainment of people. Large -size Videos are posted on YouTube, Facebook; Twitter, etc. large videos are taking lots of time for uploading.

### 3. Same videos are uploaded by an unknown person.

Sometimes same videos are uploaded by different users without permission and it can create copyright content on cloud and also it can be harmful to that original person's video.

### 4. Methodology

In this system, we will propose a methodology to deal with the upcoming techniques for user behavior based adaptive mobile video services, like video sharing on social media before sharing we have to take care of those videos which are secure and not edited with nasty content for uploading on socially and will be small size and required less storage on the cloud. Therefore we are using some techniques and algorithms to develop this system.

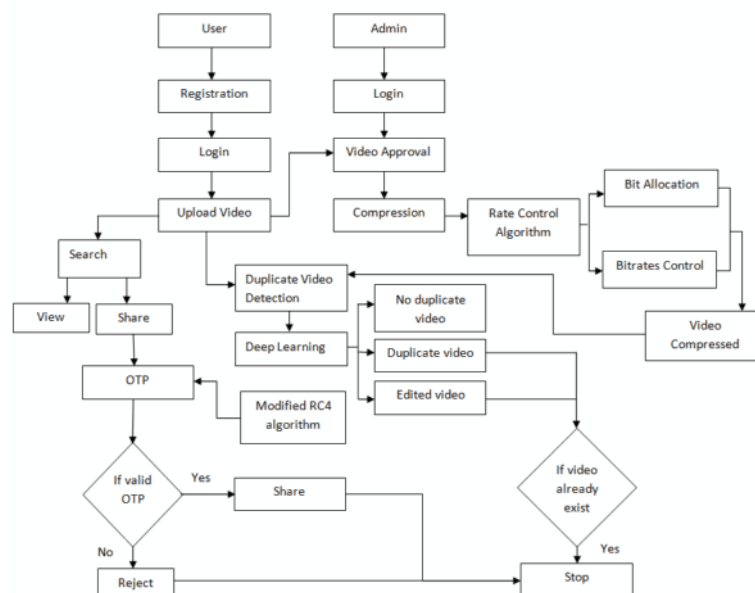


Figure 1: System work flow

For security in cloud network AMES -Cloud framework contain the Adaptive Mobile Video streaming (AMoV) and the Efficient Social Video sharing (ESoV) using security key i.e OTP. This structure is explained in our proposed system. When user demand for any video streaming that time cloud is generated run time and effectively that cloud is called as Sub - video cloud (sub-VC). This type of cloud is created for each mobile user. The encoder uses the RC4 method for encryption and for the encryption technique every user has a unique PIN which is sent by the cloud server to the user mobile through SMS. The video is uploaded by the admin and the user also. But there is one condition that, if the user wants to upload the video then he can just use the upload section and after that, the admin approves it only when it is stored on the sub -VC. When the user is authorized, the admin can upload the video otherwise it is discarded. Sometimes large-size videos are taking too much time for uploading

on the server that time we have to decrease the size of that video for that purpose we are using the compression method by using the Rate control algorithm. After approval of the video if the video size is large then this video has to compress otherwise we can directly upload it. Our system is also checking the pirated videos of a server if any video is already stored on the server then it detected that the video already exists and then this video stops uploading otherwise it can proceed. We are using a hybrid deep learning algorithm for detecting pirated videos.

### 1. Rate Control Algorithm:

**Bit allocation algorithm m:-**The purpose of bit allocation is to apportion the total number of bits available for the quantization of filter bank outputs to achieve the best video quality. The quality and the bit rate are two essential desires for bit allocation. For MPEG Layers I and II, control over the quality and the bit rate is carried out by a uniform quantize. Hence the aim of bit allocation is just to apportion the whole range of bits offered for the division of the sub-band signals to reduce the audibility of the quantization noise.

**Bitrates Control Algorithm:** -One of the most common encoding parameters available for live and on-demand streaming is bitrates control, which dictates how the encoder allocates the encoded audio and video data within the file. Bitrates control algorithm works well for the update of the picture level model parameters under the VPCC framework.

The only reason you would need uncompressed video would be for post-production, especially if you're going to be doing heavy effects and green screen work. Plus, most cameras use built-in compression when they're recording (including professional ones), so even if you uncompressed the video after it's recorded you wouldn't be increasing the quality of the video.

### 2. Modified RC4 Algorithm:

RC4 is a stream cipher and variable-length key algorithm. This algorithm encrypts one byte at a time (or larger units at a time).

A key input is a pseudorandom bit generator that produces a stream 8-bit number that is unpredictable without knowledge of the input key, The output of the generator is called a key-stream, which is combined one byte at a time with the plaintext stream cipher using XOR operation.

Following are the RC4 encryption algorithm steps:

- 1 Fetch information from the database which is to be encrypted.
- 2 Calculate array of string.
- 3 Initialize one array of 0 to 255 numbers.
- 4 Take a second array with the secret key.
- 5 Solution array is a base array for the first array because it bases on it i.e key array.
- 6 Generate the final solution stream.
- 7 For ciphertext generation make XOR between the final solution stream and the data which is to be encrypted.

### 3. Hybrid Deep Learning:

A hybrid deep neural network model is designed by the fusion of homogeneous convolution neural network (CNN) classifiers. The ensemble of classifiers is built by diversifying the input features and varying the initialization of the weights of the neural network. Hybrid Machine Learning Approaches: A Method to Improve Expected Output of Semi-structured Sequential Data. ... The extracted data are used to simulate inherently sequential data to test the principle.

Deep hybrid learning is combining a conventional deep learning model with other learning algorithms. It is converting standard deep neural network architectures of one form and fusing with a learning algorithm (typically a machine learning algorithm).



#### 4. Scope & Limitation

##### Scope:

Recent progress in visual capture technology has enabled the capture and digitization of points corresponding to a 3D world scene. Clouds are one of the major 3D data representations, which provide, in addition to spatial coordinates, attributes associated with the points in an HD world. Video sharing has become increasingly trendy with commercial video streaming applications such as YouTube accounting for a huge quantity of Internet traffic. Video sharing is a daily routine task for people. Every day huge amount people update their lives videos are uploaded on social media, but some people are uploaded hostile videos to damage someone's image. With the purpose of security of sharing a video with original content and with high-quality videos with limited storage, we are developing this system by using different algorithms.

##### Limitation:

1. **Earning money:** Not all social media platforms give the security of earning money by video sharing.
  2. **Resolution:** Some applications are not allowing uploading 4K as well as cannot see the 4K videos. These applications only allowed 1080p resolutions videos.
  3. **Format:** Some social media platforms do not support all formats of video. Some applications are supported only MPEG videos.
  4. **Verification:** Peoples have to verify their mobile number socially. If your account is not verified with your mobile number, then you cannot upload a large video or long-time video on social media.
  5. **Security:** Social media is one such disruption that has revolutionized the way information exchanges in real-time.
  6. **Access Control:** Many believed social media would be helpful only when it was available in local/regional languages
- 5. Utility**
1. **Smaller overall file sizes:** Compression allows for faster transfer times due to small
  2. **Fewer storage demands:** The files are significantly smaller, so they require less storage space.
  3. **Lower transmission bandwidth needs:** The files are significantly smaller, so they require less bandwidth to transmit.
  4. **Protect from copyright:** Hybrid deep learning scans user uploads and identifies matches.
  5. **Policy for saving our data:** Matching videos are automatically claimed on behalf of the asset, and your specified match policy is applied to the claimed videos before they are published on YouTube.

#### 6. Conclusion

The proposed framework proposes an overhauled modified RC4 calculation for video sharing verification by utilizing this calculation. We will safely be sharing video anyplace. Video sharing is getting secured with this calculation, as well as Sharing large estimates of video on social media could be an exceptionally extreme and time-devouring errand for each client for this reason we look the diverse strategy for compress the video estimate in a small amount of storage and also we are working on duplicate video detection for social media sites where some videos are already existed by their owner. We are utilizing rate control calculation for video compression. But to begin with, we are going ponder the most points of view of the think about.

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## To Development and Validation of UV Spectrophotometric Zero Order Derivative Simultaneous equation method for Zonisamide and Argatroban in Synthetic Mixture

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**ABSTRACT:-**To developed and validated for Zero order derivative Simultaneous evaluation of Zonisamide and Argatroban in synthetic mixture was done by UV Spectrophotometric. The solvent used was methanol to analysis of both drugs. Zonisamide has absorbance maxima at 282.00nm and Argatroban has absorbance maxima at 258.20 nm in methanol. The Linearity found in the concentration range 4 -20µg/ml and 4-20µg/ml for Zonisamide and Argatroban, respectively. The correlation coefficient ( $r^2$ ) found 0.9997 and 0.9999 Zonisamide and Argatroban, respectively. The % recovery was found to be 100.15 -100.46 and 100.19 to 100.62 for Zonisamide and Argatroban, respectively. According to ICH Q<sub>2</sub>R<sub>1</sub> guidelines all parameter such as linearity, precision, accuracy, LOD and LOQ was validated. The method was successfully developed for quantitative analysis of Zonisamide and Argatroban in synthetic mixture. All results were found within the acceptance criteria as per ICH guideline. The proposed method was set up to be simple, sensitive, accurate, precise and reproducible and was applicable for the simultaneous determination and routine analysis of both drugs in synthetic mixture.

**KEYWORDS:-**Zonisamide, Argatroban, Methanol, UV Spectroscopic, ICH guideline

**INTRODUCTION:-**In existing time Alzheimer's disease is one of the most common neurodegenerative disorder amongst the elderly, leading to dementia. The term "Dementia" states to several illnesses, which affect the functioning of the brain, leading to disruptions in memory, reasoning and emotional stability. In India, dementia is commonly associated with cerebrovascular disease. Other similar causes include Parkinson's disease, Lewy body dementia, alcoholism, frontotemporal dementia, drug abuse, brain tumour and infection like HIV. Zonisamide binds to sodium channels and voltage sensitive calcium channels, which suppresses neuronal depolarization and hyper synchronization and muscular pain disorder observed in Zonisamide treatment of Alzheimer disease. Due to selective inhibitory mechanism Argatroban is direct thrombin inhibitor that binds eagerly and reversibly to the catalytic site of thrombin and that does not require other cofactors to exert its antithrombotic action. Argatroban blocks both circulating and clot-bound thrombin. Zonisamide and Argatroban combination was application approved on 18<sup>th</sup> Sep 2019. Patented by Pharnext, EP Patent: EP2285374B1 combination composition of both drugs help to treatment of Alzheimer's disease and its related disorder. Therefore, there is scope to develop analytical methods for Zonisamide and Argatroban in combination.

The review of literature regarding quantitative analysis of Zonisamide and Argatroban tells that no reported method available for simultaneous determination of both drugs in combination. Thus, it is thought of curiosity to developed simple, accurate, precise and reproducible methods for simultaneous determination of Zonisamide and Argatroban in combination.

**MATERIAL AND METHOD:**

**INSTRUMENT AND APPARATUS**

A shimadzu double beam UV Spectrophotometer, model no. 1800, makes: Japan with spectral width of 2nm, wavelength accuracy of  $\pm 0.1$ nm and slit width of 2nm. A pair of 10mm matched quartz cell was used to measure absorbance of all the solutions. Spectra was

automatically acquired by UV probe system software. An electronic analytical balance (Mettler Toledo), Sonicator (Labindia), Volumetric Flask, Pipettes, Beaker and rubber bulb was used to develop this method.

**REAGENT AND MATERIALS:** -Zonisamide working standard API was received gift sample from ZCL Pvt. Ltd., and Argatroban working standard API was received gift sample from BDR pharmaceutical International Pvt. Ltd.

All the reagents and solvents were used of Analytical grade and HPLC grades for this study.

#### **PREPARATION OF SOLUTIONS:**

##### **1. Standard stock Solution of Zonisamide and Argatroban**

An accurately weighed quantity of Zonisamide (10mg) and Argatroban (10mg) was shifted into individual 100ml volumetric flask and dissolved with 25ml with methanol, sonicated for 10-15 min and diluted up to the mark with methanol to obtain standard solution having concentration of 100µg/ml ZON and ARG respectively.

##### **2. Working standard solution of Zonisamide and Argatroban**

From 100µg/ml solution of Zonisamide and Argatroban 0.4, 0.8, 1.2, 1.6 and 2.0 ml was transferred individual into 10 ml volumetric flask and adjust with methanol up to mark to get the final concentration of 4, 8, 12, 16 and 20µg/ml.

**SIMULTANEOUS EQUATION METHOD:** -To determine wavelength for measurement, standard spectra of Zonisamide and Argatroban was scanned between 200-400nm against methanol. The method was based on the measurement of absorbance of Zonisamide and Argatroban at 282.00nm and 258.20nm respectively. This method obeyed Beer's law in the concentration range of 4-20µg/ml for Zonisamide and 4-20µg/ml for Argatroban.

$$C_x = \frac{A_2 a_{y1} - A_1 a_{y2}}{a_{y1} a_{x2} - a_{y2} a_{x1}}, \quad C_y = \frac{A_1 a_{x2} - A_2 a_{x1}}{a_{y1} a_{x2} - a_{y2} a_{x1}}$$

#### **PREPARATION OF CALIBRATION CURVE:**

**Calibration Curve for Zonisamide and Argatroban:** -This series consisted of five concentrations of standard ZON and ARG solution ranging from 4-20µg/ml. The solutions were prepared by pipette out Standard ZON and ARG stock solution (0.4ml, 0.8ml, 1.2ml, 1.4ml and 2.0ml) was transferred individual into a series of 10 ml volumetric flask and volume was adjusted up to mark with Methanol. A zero-order spectrum, measured the absorbance at 282.00nm for ZON and 258.20nm for ARG against a reagent blank solution (Methanol).

#### **VALIDATION OF PROPOSED METHOD**

##### **1. LINEARITY AND RANGE**

**Procedure:**-The linearity response was determined by analysing 5 independent levels of calibration curve in the range of 4-20µg/ml and 4-20µg/ml for ZON and ARG respectively (n=6).

##### **2. PRECISION**

**Intraday Precision Procedure:** -The precision of the developed method was assessed by analysing combined standard solution containing three different concentrations 8, 12, 16µg/ml for ZON and 8, 12, 16µg/ml ARG. Three replicate (n=3) each on same day. The %RSD value was found to be less than 2.0 indicated that the method is precise.

**Interday Precision Procedure:** -The precision of the developed method was assessed by analysing combined standard solution containing three different concentrations 8, 12, 16µg/ml for ZON and 8, 12, 16µg/ml ARG triplicate (n=3) per day for consecutive 3 days for inter-day precision. The %RSD value was found to be less than 2.0 indicated that the method is precise.

##### **3. ACCURACY**

It was analysed by calculating the recovery of ZON and ARG by standard addition method. The known amt. of standard was added at three different levels to pre-analysed sample. Each determination was performed in triplicate. The accuracy of the method was checked by

recovery experiment performed at three different levels of 80%, 100% and 120%. % recovery for Zonisamide and Argatroban calculated. Data from nine determinations over three concentration levels covering the specified range was determined and % recovery was calculated. Recovery between 98-102 % justifies the accuracy of the method.

#### 4. LIMIT OF DETECTION AND LIMIT OF QUANTITATION

The Limit of detection and quantitation of the developed method examined ten replicated of standard solutions containing concentrations 4µg/ml ZON and 4µg/ml for ARG.

The LOD and LOQ were calculated as following formula  $LOD=3.3 \sigma/S$  and  $LOQ = 10\sigma/S$ , Where,  $\sigma$  is the standard deviation of the lowest standard concentration and S is the slope of the standard curve.

#### 5. ROBUSTNESS AND RUGGEDNESS

Robustness and Ruggedness of the parameter was examined by subjecting the method to slight change in the parameter condition individually.

- Change in analyst
- Change in wavelength from 282.00nm and 258.20nm to 282±2nm and 258.20±2 nm.
- Three replicates were made for the same concentration and % RSD was calculated.

#### 6. ASSAY BY UV SPECTROPHOTOMETRIC METHOD

**Composition of Synthetic mixture as per patent:**

Zonisamide :100mg  
 Argatroban :100mg  
 Magnesium stearate :40mg  
 Talc : 950 q. s

- From the Synthesis Mixture weigh accurately equivalent about 10mg of ZON (10 mg of ARG) in 100ml Volumetric Flask and dissolve in 25ml of Methanol. The flask was sonicated for 10-15 min. and Dilute up to the 100 ml with Solvent. Shake vigorously; filter the solution and further Dilution.
- Finally, the solution had the concentration **100µg/ml and 100µg/ml** respectively for ZON and ARG. After that from this solution **1.2ml** was pipette out and diluted up to **10 ml with Methanol**. So, the concentration was **12µg/ml and 12µg/ml** for ZON and ARG respectively.

**RESULT AND DISCUSSION:**The method was validated as per ICH Q<sub>2</sub>R<sub>1</sub> guidelines.

#### VALIDATION OF PROPOSED SPECTROPHOTOMETRIC METHOD

##### 1. LINEARITY AND RANGE

- The linearity response was determined by analysing 5 independent levels of calibration curve in the range of **4-20µg/ml** for **ZON** and **ARG** respectively with correlation coefficient ( $r^2$ ) of 0.9997 and 0.9999 for ZON and ARG respectively. (**n=6**).
- The Regression Line equation for ZON and ARG Respectively,  
 $y= 0.0278x-0.0048$  for ZON \_\_\_\_\_ (1)  
 $y= 0.0476x-0.0058$  For ARG \_\_\_\_\_ (2)

##### Linearity of Zonisamide

**Table 1.1: Linearity of Zonisamide**

Sr. No.	ZON µg/ml	Absorbance ± SD 282.00nm (n=6)	%RSD	ZON µg/ml	Absorbance ± SD 258.20nm (n=6)	%RSD
1.	4	0.076 ± 0.0005	0.682	4	0.017 ± 0.00006	0.372
2.	8	0.143 ± 0.0005	0.384	8	0.027 ± 0.0004	1.503
3.	12	0.215 ± 0.0012	0.544	12	0.039 ± 0.0005	1.336
4.	16	0.286 ± 0.0004	0.143	16	0.052 ± 0.0006	1.216
5.	20	0.357 ± 0.0008	0.235	20	0.065 ± 0.0008	1.161

## Linearity of Argatroban

**Table 1.2: Linearity of Argatroban**

Sr. No.	ARG $\mu\text{g/ml}$	Absorbance $\pm$ SD 258.20nm (n=6)	%RSD	ARG $\mu\text{g/ml}$	Absorbance $\pm$ SD 282.00nm (n=6)	%RSD
1.	4	0.174 $\pm$ 0.0008	0.469	4	0.037 $\pm$ 0.0006	1.770
2.	8	0.337 $\pm$ 0.0011	0.347	8	0.072 $\pm$ 0.0008	1.170
3.	12	0.505 $\pm$ 0.0006	0.125	12	0.105 $\pm$ 0.0012	1.150
4.	16	0.690 $\pm$ 0.0007	0.109	16	0.145 $\pm$ 0.0004	0.281
5.	20	0.850 $\pm$ 0.0010	0.121	20	0.183 $\pm$ 0.0006	0.346

## Linearity of Mixture

**Table 1.3: Linearity of Mixture**

Sr. No.	ZON $\mu\text{g/ml}$	Absorbance $\pm$ SD 282.00nm (n=6)	%RSD	ARG $\mu\text{g/ml}$	Absorbance $\pm$ SD 258.20nm (n=6)	%RSD
1.	4	0.109 $\pm$ 0.0006	0.580	4	0.185 $\pm$ 0.0006	0.342
2.	8	0.218 $\pm$ 0.0004	0.187	8	0.376 $\pm$ 0.0006	0.168
3.	12	0.325 $\pm$ 0.0005	0.159	12	0.562 $\pm$ 0.0004	0.073
4.	16	0.436 $\pm$ 0.0004	0.094	16	0.752 $\pm$ 0.0006	0.084
5.	20	0.552 $\pm$ 0.0004	0.740	20	0.948 $\pm$ 0.0006	0.067

## 2. PRECISION

### A. Intraday Precision

**Table 1.4: Intraday Precision data for estimation of ZON and ARG (n=3)**

Conc. ( $\mu\text{g/ml}$ )	Zonisamide and Argatroban			
ZON+ARG	Absorbance 282.00nm	% RSD	Absorbance 258.20nm	% RSD
8:8	0.217 $\pm$ 0.0006	0.266	0.378 $\pm$ 0.0012	0.305
12:12	0.325 $\pm$ 0.0015	0.470	0.565 $\pm$ 0.0012	0.204
16:16	0.436 $\pm$ 0.0006	0.132	0.754 $\pm$ 0.0012	0.203

### B. Interday Precision

**Table 1.5: Interday Precision data for estimation of ZON and ARG (n=3)**

Conc. ( $\mu\text{g/ml}$ )	Zonisamide and Argatroban			
ZON+ARG	Absorbance 282.00nm	% RSD	Absorbance 258.20nm	% RSD
8:8	0.217 $\pm$ 0.0006	0.266	0.376 $\pm$ 0.0010	0.266
12:12	0.326 $\pm$ 0.0012	0.355	0.564 $\pm$ 0.0012	0.205
16:16	0.437 $\pm$ 0.0012	0.264	0.754 $\pm$ 0.0010	0.133

## 3. ACCURACY

**Table 1.6: Accuracy of ZON and ARG**

Amt. of Formulation(mg)		Amt. of API Spiking (mg)		Total Amt. (mg)	
ZON	ARG	ZON	ARG	ZON	ARG
8	8	-	-	8	8
8	8	7	7	15	15
8	8	8	8	16	16
8	8	9	9	17	17

**Table 1.7: % Recovery data of ZON and ARG (n=3)**

% Recovery	Total Con.		Amplitude		Con. Found (8mg)		% Recovery $\pm$ SD		% RSD	
Drug	ZON	ARG	ZON	ARG	ZON	ARG	ZON	ARG	ZON	ARG
Control	8	8	-	-	-	-	-	-	-	-
80 %	15	15	0.414	0.660	15.04	15.07	100.27 $\pm$ 0.020	100.47 $\pm$ 0.080	0.138	0.805
			0.413	0.659						
			0.413	0.659						
100 %	16	16	0.441	0.710	16.02	16.10	100.15 $\pm$ 0.020	100.62 $\pm$ 0.200	0.129	0.199
			0.440	0.708						
			0.441	0.707						
120 %	17	17	0.470	0.807	17.08	17.03	100.46 $\pm$	100.19 $\pm$	0.210	0.537
			0.469	0.800						



			0.471	0.808			0.211	0.538		
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#### 4. LOD and LOQ

**Table 1.8: LOD & LOQ value of ZON and ARG (n=10)**

Drugs		LOD ( $\mu\text{g/ml}$ )	LOQ ( $\mu\text{g/ml}$ )
ZON + ARG	282.00nm	0.0791	0.2398
	258.20nm	0.0512	0.1550

#### 5. ROBUSTNESS AND RUGGEDNESS

**Table 1.9: Different Analyst (n=3)**

Parameter		ZON 282.00nm	% RSD	ARG 258.20nm	% RSD
Different Analyst	Analyst-1	0.107 $\pm$ 0.0010	0.935	0.185 $\pm$ 0.0005	0.313
	Analyst-2	0.107 $\pm$ 0.0011	1.083	0.186 $\pm$ 0.0005	0.310

**Table 1.10: Change in Wavelength of 282.00 nm (n=3)**

Parameter	Wavelength	ZON 282.00nm	% RSD
Change in Wavelength	280.00	0.107 $\pm$ 0.0006	0.538
	284.00	0.108 $\pm$ 0.0005	0.533

**Table 1.11: Change in Wavelength of at 258.20nm (n=3)**

Parameter	Wavelength	ARG 258.20nm	% RSD
Change in Wavelength	256.20	0.183 $\pm$ 0.0010	0.546
	260.20	0.183 $\pm$ 0.0005	0.316

#### 6. Assay by UV Spectrophotometric Method for Zero Order Derivative Method

**Table 1.12: Assay (n=3)**

Drugs		% Assay $\pm$ SD	% RSD
ZON + ARG	282.00nm	100.64 $\pm$ 0.630	0.626
	258.20nm	100.91 $\pm$ 0.391	0.387

**Table 1.13: Summary of Validation Parameter**

Sr. No.	Parameter	Zonisamide	Argatroban	Acceptance Criteria
1.	Linearity & Range (n=6)	4-20 $\mu\text{g/ml}$	4-20 $\mu\text{g/ml}$	-
2.	Regression Equation	y= 0.0278x - 0.0048	y= 0.0476x - 0.0058	-
3.	Correlation Coefficient ( $r^2$ )	0.9997	0.9999	NLT 1
4.	Precision (n=3)			% RSD NMT 2.0 %
	A. Intraday	0.132 - 0.470	0.203 - 0.305	
	B. Interday	0.264 - 0.355	0.133 - 0.266	
5.	Accuracy (% Recovery) (n=3)	100.15 to 100.46 %	100.19 to 100.62 %	NLT 98.0 % to NMT 102.0 %
6.	LOD (n=10)	0.0791 $\mu\text{g/ml}$	0.0512 $\mu\text{g/ml}$	-
7.	LOQ (n=10)	0.2398 $\mu\text{g/ml}$	0.1550 $\mu\text{g/ml}$	-
8.	Robustness (n=3)	0.935 - 1.083	0.310-0.313	% RSD NMT 2.0 %
9.	Ruggedness (n=3)	0.533 - 0.538	0.316 - 0.546	% RSD NMT 2.0 %
10.	Assay (n=3)	100.64 $\pm$ 0.630	100.91 $\pm$ 0.391	-

**CONCLUSION:-**All the parameters are validated as per ICH Q<sub>2</sub>R<sub>1</sub> guidelines for the method validation and initiate to be suitable for routine quantitative analysis in pharmaceutical dosage form. The result of linearity, range precision and accuracy showed to be within limits with LOD and LOQ, Robustness and Ruggedness of method was established as no significant effect were found on analysis by subjecting this method. Assay of synthetic mixture was also determined and result was found within limit.

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## A CFD FOR GAS TURBINE BY USING BIOMASS IN ENGINEERING ADVANCEMENT DIFFERENTS PARAMETERS

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**Abstract:** Biomass is sources of Renewable Energy ,generate power is conversion gaseous & liquids ,Gas turbine is very important process in shaft compressor ,turbine is very different results.CFD Computational Fluid Dynamics is fluid mechanics, data structure and analysis in numerical output results different material approach.

**Keywords—** Biomass, Bio-fuel, Gas turbine, Renewable Energy.

### Introduction

**Biomass:-**Biomass is one of the most important sources of renewable energy; which can be used to generate power, by combustion or biochemical conversion to gaseous or liquid fuels like ethanol, methanol and gaseous fuels like methane, hydrogen etc. It has great potential to generate heat energy and to increase the production of electricity with lesser transportation cost of the fuels. Energy produced from biomass can contribute greatly toward the goal of reducing greenhouse gas emission and eliminating climate change problems. Bio-mass is plant or animal material used for production of electricity, heat and different industrial process as raw material. It can be forest residues, energy crops, wood, Waste from Food crops, horticulture, animal framing manure or human waste from sewage plants.Conversion of biomass to bio -fuel requires bio -fuel generating unit. There are following processes in these regards.

1) Biomass thermal conversion

- a)Gasification
- b) Combustion
- c) Pyrolysis

Applications: Heat, Electricity, combined Heat and Power, Transport fuel.

2) Biomass chemical conversion

- a)Anaerobic digestion
- b)Fermentation
- c)Composting

Applications: Alcohol, Ethanol, Fertilizer, Methane

If Bio-fuel is generated in Bio -Fuel generating plant Gas turbine unit convert the Energy of Bio-fuel into Shaft work.

### Gas Turbine

A gas turbine unit consist of 1) Gas Compressor 2) A Combustor 3) Downstream turbine Turbine and compressor are mounted on the same shaft. A gas turbine brings together air that it compressed in compressor and fuel which are ignited. Resulted gases are expanded in turbine. Thus turbines shaft continues to rotate the generator coupled to turbine shaft. Some energy of the turbine shaft is used for driving the compressor which is on the same shaft of turbine. A separate starter unit is provided for the first rotor motion until turbine rotates upto design speed and keep entire unit running. Thermodynamic parameters like compression

Ratio, ambient pressure, humidity, turbine inlet temperature, heat rate, specific fuel consumption, air to fuel ratio, component efficiency is also considered for review of gas turbine performance. Computational Fluid Dynamics (CFD) branch of fluid mechanics that uses numerical analysis and data structure is used to analyses and solve problems that are involved in fluid flow. Computers are used to perform the calculations required to simulate the free -stream flow of fluid and the interaction of the fluid with surfaces; defined by boundary conditions. The world's energy demand is projected to grow significantly over the next few years. This will increase the result of economic growth, industrial expansion, high population growth, and urbanization, expressly in the developing countries. The major part of this energy demand is believed to meet by using non -renewable fossil fuels with a limited supply.

**Methodology:-**Process of Conversion of bio mass to bio -fuel is happened at bio -fuel generating unit. It has various processes for conversion but we use Bio -Mass chemical conversion (Anaerobic digestion) process to convert bio -mass into bio fuels. This process method given below Firstly bio -mass comes in comes in digester of bio -fuel generator through inlet chamber. In digester anaerobic chemical conversion process is happen. In this process bacteria and micro-organism convert carbohydrates in to simplex form. Digester temperature should be maintained at range of 30 to 38<sup>0</sup>C, and ambient temperature maintained at 20 to 45 <sup>0</sup>C .because bacteria and microorganism could survive in this temperature range. Anaerobic conversion process is happen in three stages they follow.

### 1) Bacterial Hydrolysis

Here Carbohydrates converted into soluble simplex form i.e. in sugar (C<sub>12</sub>H<sub>22</sub>O<sub>11</sub>) and Amino Acid(R-CH (NH<sub>2</sub>)-COOH).

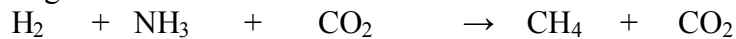
### 2) Acidogenic Bacterial

Sugar +Amino acid →hydrogen +carbon dioxide+ Acidic Acid  
(C<sub>12</sub>H<sub>22</sub>O<sub>11</sub>)+ (R-CH (NH<sub>2</sub>)-COOH) → H<sub>2</sub> + CO<sub>2</sub> +CH<sub>3</sub>CO<sub>2</sub>H

Further acidogenic bacteria breaking down acidic acid in to hydrogen , ammonia and carbon dioxide.

### 3) Archea (Methegons)

Hydrogen + Ammonia + Carbon dioxide → Methane + Carbon dioxide



In this way fuel gas methane (CH<sub>4</sub>) is formed from biomass in digestion plant by anaerobic conversion process.

Performance of gas turbine is evaluated by using Bryton cycle formula.

$$\eta_{th} = \frac{(\text{Net work } - \text{Heat supplied})}{W_t - W_c} + \text{Heat Supplied} = W_{net} + q_A$$

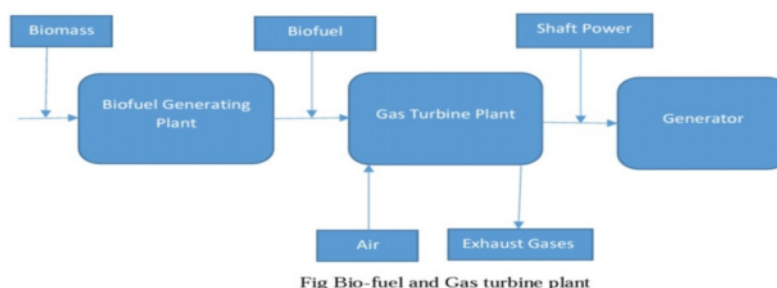
Where W<sub>t</sub> =Turbine work

W<sub>c</sub>=Compression work

W<sub>net</sub>=Net Work

q<sub>A</sub> =Heat supplied

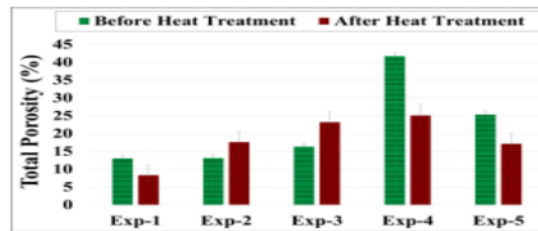
Gas turbines are used in aircraft, trains, ships, electrical generator, pumps, gas compressor



## RESULTS

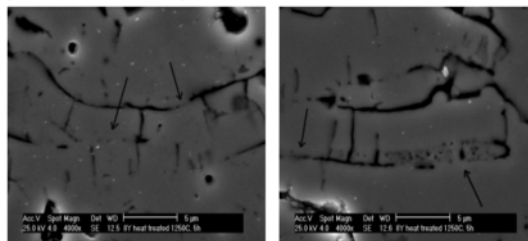
### Micro structural Changes after Heat Treatment

Total Porosity content in % area for all five coatings before and after heat treatment



Microstructure and phase structure of the heat treated coatings

SEM micrographs of heat-treated 8Y coating illustrating the sintering of the structure



### Thermal Wave Imaging

The specimens were exposed to a thermal wave for 0.25 seconds and 1 second under a high YS at left and a lower YS at right using xenon lamps with three distinct Z thicknesses (i.e. 380, 635m, and 1015). The 0.25-second and 1-second videos reveal a minor difference between the samples, but there is no discernible change between the specimens, with the exception of the one described above in the thermal expansion phase

**Conclusion:**-Biomass is a significant non-conventional energy reserve. Its topographical independence and comparatively ample availability makes it a promising choice over other renewable sources such as solar, wind or hydroelectric storage. Bioenergy technologies such as gasification can utilize a variety of biomass types to produce useful products including electrical power and hydrogen. A deep understanding and knowledge of the process along with the alternative approaches to gasification are required for optimization and advancements in a cost-effective manner

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## Data Mining Engineering Advancement: Estimation of the Mobile Apps for Children with Special Education.

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**Abstract:**-In engineering, data driven methods are rapidly being used to develop and optimize new information. The data driven method such as Data Mining (DM) helps in exploring and analyzing the large blocks of material and then processing it to get the essential facts. The aim of this paper is to analyse the numerous mobile application design and most frequently used by the children with special needs. To determine frequency and the familiarity with which the children are using this applications in Vasai – Virar region Mumbai India.

**Keywords**-Data Mining, Mobile technology, Special Educational Mobile Applications, Teaching-Learning Process.

**Introduction:-**Data mining activity enables one to discover the new knowledge from the massive volumes of data. Data mining procedure as a blessing in the engineering has lead us to select “The Best Out Of Rest”. Mining is a vivid term characterizing the process that finds a small set of precious nuggets from a great deal of raw material. (Prasdika & Sugiantoro, 2018). The term "Special education needs and disabilities (SEND)" is used for the children or young persons, who have certain disorders such as: reading/writing; an inability to socialization; inability to understanding; inability to concentrate for a long time; etc. (Kraleva & Kraleev, 2018) . The mobile technologies have reached a milestone in developing the applications for special education, which are referred as Assistive Technology Mobile. There are abundant teaching learning applications to support disable children and make them self reliant. Data mining process helps in selecting the finest app among all, according to the need of the children and hence making the teaching learning operation a peaceful.

**Special Education Mobile Applications :-**With the expeditious development of the mobile technologies such as Smartphone’s, mobile learning application has also gained its popularity. Supporting children with special educational needs takes patience, understanding and a range of Special Education Apps (SEN) teaching resources tailor -made for each child’s requirements. Choosing from a range of SEN apps to help children with a range of skills, from speech and language, to numeracy, or social skills apps . Supporting children with autism, dyslexia, down syndrome a visual, hearing or sensory impairment, cognitive impairments, ADHD or another learning difficulty. As shown in the table 1 below different applications work on different devices and platforms.

Table 1: Special education mobile apps the platforms and devices it supports.

Mobile apps	Mobile Platforms			Devices	Description
	Windows phones	Android	iOS		
Simple Sentence Builder	No	Yes	Yes	Android, iphone, iPad	It helps childres to build a sentence through art of story telling
Avaz AAC	No	Yes	Yes	Android, iphone, iPad	It’s an augmentative and alternative communication app that empowers children and adults having speech-related disabilities
Omoguru: Dyslexia Friendly Reader	No	Yes	Yes	Android, iPhone, iPad	Dyslexic students (and adults) use Omoguru to make the text more readable and decode words with ease.
Peek and Seek	No	Yes	Yes	Android, iPhone, iPad	Its been created to address a very specific need- that of developing visual discrimination skills in children
Keyboard Fun	No	Yes	Yes	Android, iPhone, iPad	The app has been created by an Occupational Therapist in order to help children with physical or learning disabilities.
Talk For Me	No	Yes	Yes	Android,	Talk For Me is specifically for those with speech



				iPhone, iPad	communication difficulties, Influenced by Speech Pathologists & Speech Therapists, Talk For Me is a multipurpose communication tool that allows people communicate their needs using images that they take with their iPod, iPhone or iPad.
Learning Ally Audiobooks	No	Yes	Yes	Android, iPhone, iPad	Help anyone who experiences difficulty in reading print material succeed. Formerly Recording for the Blind & Dyslexic.
Speech Companion Speech Therapy	No	Yes	Yes	Android, iPhone, iPad	SpeechCompanion helps to improve mouth and tongue motor skills with speech therapy exercises
<u>iCan   Special Educational Fun</u>	No	Yes	Yes	Android, iPhone, iPad	iCan™ app contains an endless ad-free library of educational videos and games that promotes children's socio-emotional, self-care, cognitive, and academic skills.
TalkTablet – Autism Speech AAC	Yes	Yes	Yes	Android, iPhone, iPad, windows	It is a speech solution for children with Autism, Aphasia, Down Syndrome, Stroke or other condition that affects their ability to communicate.
Clicker Docs	No	Yes	Yes	Android, iPhone, iPad,	Useful for learners with dyslexia and struggling spellers.
Proloquo2Go	No	Yes	Yes	Android, iPhone, iPad,	Useful for one with speech difficulty
Montessori Numbers - Math Activities for Kids	No	Yes	Yes	Android, iPhone, iPad,	This special education resource lets them actually touch buttons and move things on the screen to count numbers, move blocks and do other simple tasks.
Visual Steps	Yes	No	No	Windows	
Easy Dyslexia Aid - Dysgraphia Spelling & Literacy Helper	No	Yes	Yes	Android, iPhone, iPad	Kids with dysgraphia may struggle with handwriting, organising their thoughts on paper or with both of these activities. Easy Dyslexia Aid can support with both these conditions and serves as an extremely useful companion both inside and outside the classroom making it one of the best special education resources.
Visual Reading	No	Yes	Yes	Android	The most useful reading program app out there for young learners with Autism.
EMOFACE Play & Learn emotions	No	Yes	Yes	Android, iPhone, iPad	Emoface helps kids who find it difficult to recognise emotions in other people
<u>Cboard</u>	No	Yes	Yes	Android, iPhone, iPad	Cboard is an Augmentative and Alternative Communication (AAC) web app for children and adults with speech and language impairments, aiding communication with symbols and text-to-speech.
<u>Miogym: Speech Therapy Toddler</u>	No	Yes	Yes	Android, iPhone, iPad	Miogym is a subscription-based app that has been developed to help turn speech therapy into a fun, interactive game for young children. Children are able to work their way through a number of activities and exercises that help them to gain the basics and cement their abilities in learning how to speak correctly
Lil Requester	No	Yes	Yes	Android, iPhone, iPad	Lil' Requester is a unique application that was founded by parents for parents and created to help children with socio-communication challenges express themselves and their needs effectively. This application will enable the user to communicate their needs and express themselves verbally enabling them to make decisions or choices easily.

## Literature Review

The technological evolution has helped to expand our communication into global territories. Mobile apps became more popular in the 2007 when the first iPhone was launched; letting people download information, games, books and more within seconds. And the following

years showed the tremendous growth in the mobile apps compatible on different platforms such as windows, android, iOS, and accessible through different devices. Smartphones and apps have transformed the way we perceive Assistive Technology as the advancements in AT are observable in many accessibility features of mobile devices (Accessibility in Disability, 2018). That’s truly incredible.

The information assembled for this research was from both primary and the secondary sources. The primary source data was collected by questionnaire using Google form, and the secondary source data was gathered through Journals, Publications, Websites, and Articles.

**Limitations**

The data mining of most frequently used special education mobile apps by children with disabilities was done on the basis of the responses given by 43 respondents from local special Schools and other institutes; this research was done on the limited number of population basically in the Mumbai-(Vasai – Virar) region. Although this research has some limitation it has reached its aim.

**Data Analysis and Interpretation**

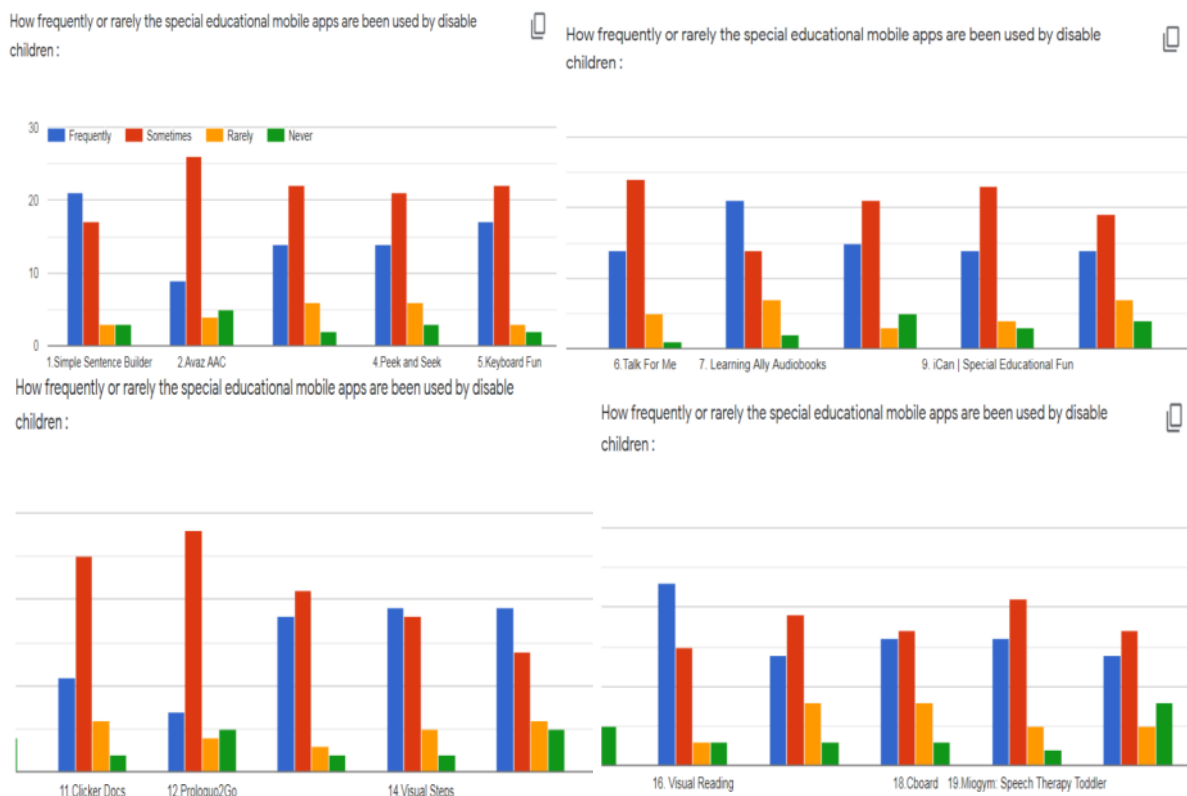


Figure 1: Evaluation of the special education mobile apps.

Table 2: Analysis of frequently used mobile apps for special education.

Mobile apps	Frequently	Sometimes	Rarely	Never
Simple Sentence Builder	21	16	3	3
Avaz AAC	8	26	4	5
Omoguru: Dyslexia Friendly Reader	14	21	6	2
Peek and Seek	13	21	6	3
Keyboard Fun	17	21	3	2
Talk For Me	13	24	5	1

Learning Ally Audiobooks	21	13	7	2
Speech Companion Speech Therapy	14	21	3	5
iCan  Special Educational Fun	14	22	4	3
TalkTablet– Autism Speech AAC	13	19	7	4
Clicker Docs	11	24	6	2
Proloquo2Go	6	28	4	5
Montessori Numbers - Math Activities for Kids	18	20	3	2
Visual Steps	18	18	5	2
Easy Dyslexia Aid - Dysgraphia Spelling & Literacy Helper	19	13	6	5
Visual Reading	22	15	3	3
EMOFACE Play & Learn emotions	14	18	8	3
Cboard	15	17	8	3
Miogym: Speech Therapy Toddler	16	20	5	2
Lil Requester	13	17	8	5
Total	300	394	104	62
%	34.88372093	45.813953	12.09302	7.2093

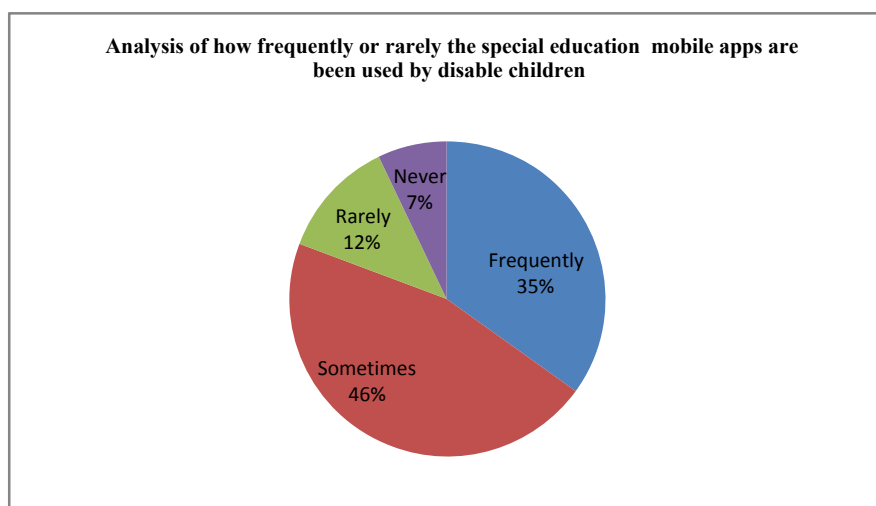


Figure2: Pictorial representation of the analysis.

**Conclusion:**-Mobile technology has not only revolutionized the way we communicate, but is also becoming a vital medium for educational and rehabilitation. Disability does not mean inability, and the features and functionalities based on accessibility are present in modern day mobile apps which makes the teaching-learning process easy. “To educate a special child is to turn walls into doors.” But the developing technology has made the life of educator as well as learner trouble-free. As a result of this study it was concluded that, even though there are several mobile apps which are helpful for special education; only few which are compatible on different platforms and user friendly are been used frequently. It was observed that 81% population mostly use the apps; 12% rarely make use of these apps; and 7% never make use

of these special education mobile applications. It might be due to lack of facilities or due to unawareness still 19% population rarely or never use the beneficial apps. Analysing how gigantic children will be benefited through these effortless special education mobile apps will be my future scope of study.

**Acknowledgement:**-I would like to thank Dr. Madhu Gupta Ma'am, ICEA conference committee members and all other teaching faculties of JJT University for their continuous support and motivation towards writing the research paper.

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## A Novel Approach for Attribute-Based Encryption Scheme with Privacy - Preserving Mechanism in Cloud Computing

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**Abstract-**Cloud computing is the mass storage area that helps the user to access the data anywhere. There are so many platforms provided by the cloud service provider. They are SaaS (Software as a Service), PaaS (Platform as a Service) and IaaS (Infrastructure as a Service) etc. Though security is not fully provided by the cloud service provider to reshape the advances in information technology, cloud computing is expected as an updated technology. The data was securely stored in the cloud and if it is corrupted then the proxy is implemented to regenerate the corrupted data in the cloud. T. Cloud storage system endows users to remotely store their data and utilize the on-demand superiority cloud applications without the burden of local hardware and software management. While cloud computing induces these advantages more appealing than ever, it also brings revolutionary and challenging security threats to the outsourced data. To ensure the data security and integrity in cloud storage, until now, a large number of techniques have been proposed to handle this problem, but all of them have possess their own inherent limitations. In this project, give the formal model of Ciphertext-policy Attribute Based Encryption (CP-ABE) algorithm with a hierarchical structure to improve scalability and flexibility. This effectively eliminates the need to rely on the data storage server for preventing unauthorized data access and integrity. The performance measurements indicate that the proposed scheme is efficient to securely manage the data stored in the data storage servers and significantly reduces the computation time.

**Keywords-** Attribute encryption, Cloud Computing, Privacy Preserving, Cipher Text.

**INTRODUCTION:-**Due to the rapid development of new technologies such as cloud computing, Internet of Things (IoT), and mobile Internet, the data volumes are exploding, and we have truly entered the era of "Big Data." Big Data technology has been focused and applied to almost every industry, retail, healthcare, financial services, government, and so on. Particularly, in the field of industrial production, a large amount of data is generated every day, and it includes business data from information systems, machine data from industrial IoT systems, and some other data from related websites, etc. These attributes can have an access structure for secure sharing of data. Therefore, attribute-based access control schemes are efficient to share data securely with many users without taking care of their identities. To overcome the disadvantage of central authority, decentralized and distributed access control schemes are proposed.

**1.1 Background :-**Cloud computing technology can provide better solutions to the above challenge. Using cloud technology, enterprises get rid of the heavy data management work and concentrate on their main business. Nowadays, large cloud service providers, such as

Amazon, Microsoft, IBM, etc., have launched industrial cloud platforms, and more and more industrial enterprises migrate their data to these platforms. However, hosting data to third-party platforms will create new problems, because the security and privacy of the data have to depend on the credibility of the third-party. For businesses, the biggest concern is the confidentiality of industrial data. The main solution to this problem is to use encrypting methods to protect data before uploading it. However, traditional symmetric and asymmetric encryption schemes are not appropriate for providing fine-grained access control. Therefore, the above problems have brought new challenges to data encryption, and numerous studies have focused on these issues [1–3]. After these schemes, a decentralized attribute based access control with privacy preserving is addressed to provide the great secure sharing of sensitive data with multiple users. Attribute-based encryption (ABE) introduced by Sahai and Waters, is a more proficient encryption scheme and it can articulate an intricate access structure. In an ABE scheme, both the user's secret keys and the ciphertext are labeled with sets of attributes. The encrypter can encrypt a message under a set of attributes. Prior to decrypting the ciphertext, the receiver must obtain the secret keys from the central authority.

**1.2 Motivation :-** Among various solutions, attribute-based encryption (ABE) [4, 5] has become an excellent candidate because of its ability to provide data confidentiality and fine-grained access control for cloud storage. Currently, more and more industrial enterprises are using ABE. Cloud computing helps startups manage shifting computing requirements by providing greater flexibility in the computing services they purchase. A cloud-based IT infrastructure is more versatile – notably in terms of scalability – than is local, intranet-based infrastructure. In these schemes, the secret keys are associated with an access structure, while the cipher text is labeled with a set of attributes Cipher text Policy ABE (CPABE). In these schemes, the cipher text is associated with an access structure, while the secret keys are labeled with a set of attributes. Attrapadung and Imai proposed a dual policy ABE scheme which combines a KPABE scheme with CPABE scheme. In this scheme, two access structures are created. One is for the objective attributes labeled with the cipher text, and the other is for the subjective attributes held by the users. Furthermore, there is only one access structure in both KPABE and CPABE schemes.

### **1.3 Decentralized Key policy attribute based encryption steps**

These messages will be encrypted with a key and at the time of decryption, same key will be used. DKPABE will be explained and stepwise explanation.

1. Data owner will create a message and with some attributes and with combination of it one policy will be designed. These details will be submitted to Decentralized Authority to generate key.
2. Decentralized authority will issue the generated key to data owner.
3. With the help of key decentralized authority will encrypt the message.
4. These encrypted messages will be stored in data store in organized format.
5. User will send its details to data store for validation and verification.
6. Data store will go through validate user details.
7. After validation data store will allow user to download the file.
8. Valid user will request decentralized authority for keys by which message was encrypted.
9. Finally decentralized authority will issue the same key to user for decryption of message.

### **REVIEW OF LITERATURE**

1. **M. Chase and S.S. Chow (2009)**, Attribute based encryption (ABE) determines decryption ability based on a user's attributes. In a multi-authority ABE scheme, multiple attribute-authorities monitor different sets of attributes and issue corresponding decryption keys to users and encryptors can require that a user obtain keys for appropriate attributes from each authority before decrypting a message. Chase gave a multi-authority



- ABE scheme using the concepts of a trusted central authority (CA) and global identifiers (GID).
2. **JCamenisch, M. Kohlweiss (2009)**, Searchable encryption schemes provide an important mechanism to cryptographically protect data while keeping it available to be searched and accessed. In a common approach for their construction, the encrypting entity chooses one or several keywords that describe the content of each encrypted record of data. To perform a search, a user obtains a trapdoor for a keyword of her interest and uses this trapdoor to find all the data described by this keyword.
  3. **Lewko and B. Waters**, we propose a Multi-Authority Attribute-Based Encryption (ABE) system. In our system, any party can become an authority and there is no requirement for any global coordination other than the creation of an initial set of common reference parameters. A party can simply act as an ABE authority by creating a public key and issuing private keys to different users that reflect their attributes. A user can encrypt data in terms of any boolean formula over attributes issued from any chosen set of authorities.
  4. **Rial and B. Preneel**, author propose two constructions of oblivious transfer with access control (OTAC), i.e., oblivious transfer schemes in which a receiver can obtain a message only if her attributes, which are certified by a credential issuer, satisfy the access control policy of that message. The receiver remains anonymous towards the sender and the receiver's attributes are not disclosed to the sender. Our constructions are based on any cipher text policy attribute based encryption (CPABE) scheme that fulfills the committing and key separation properties, which we define.
  5. **AkoMuhamad Abdullah**, “In this paper it is described how AES has the best ability to protect sensitive data from attackers and is not allowed them to break the encrypt data AES algorithm uses a particular structure to encrypt data to provide the best security. To do that it relies on a number of rounds and inside each round comprise of four sub-process. Each round consists of the following four steps to encrypt 128-bit block” [5]
  6. **Sukumar Sharmila**, “Searchable encryption is increasing interest for protecting the data privacy in secure searchable cloud storage. The security of a well-known cryptographic primitive, namely, public key encryption with keyword search (PEKS) which is very useful in many applications of cloud storage. the semantic security against chosen keyword attack which guarantees that no adversary is able to distinguish a keyword from another one given the corresponding PEKS ciphertext.

## PROPOSED SYSTEM ARCHITECTURE

### 3.1 Cloud Server:

- The Cloud Server, who is assumed to have adequate storage capacity, does nothing but store them.

### N Attribute Authorities:

- Authorities are assumed to have powerful computation abilities, and they are supervised by government offices.

The whole attribute set is divided into N disjoint sets and controlled by each authority, therefore each authority is aware of only part of attributes.

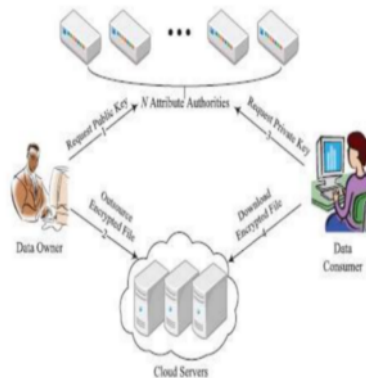
### 3.2 Data Owner:

- A Data Owner is the entity who wishes to outsource encrypted data file to the Cloud Servers. A user can be a Data owner and a Data consumer simultaneously

### 3.3 Data Consumers:

- Newly joined Data Consumers request private keys from all of the authorities, and they do not know which attributes are controlled by which authorities. When the Data Consumers request their private keys from the authorities, authorities will jointly create corresponding private key and send it to them.

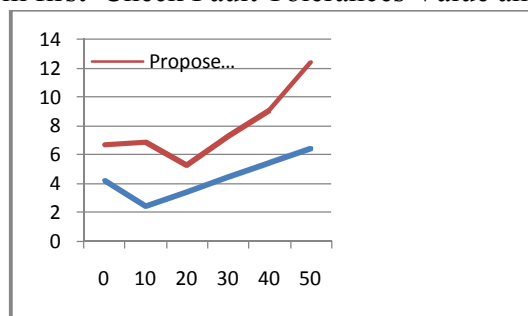
- All Data Consumers are able to download any of the encrypted data files, but only those whose private keys satisfy the Encryption Policy can execute the operation.



**Figure.01. Proposed Systemarchitecture**

**IV. RESULT AND DISCUSSION**

Here, In Table 1 entity Analysis of person such as Admin, Cloud which performances different role. In Our System Data Owner Upload the Data in Dynamic Group which are show to Admin Side after show the Data “Click to Encryption” when User Request to Data access of Owner than System first Check Fault Tolerances Value and Then access To User



**Figure 01. Number of Policy Attributes**

Table: 01 Analysis for file uploading and downloading time while encrypting the files and assigning an attribute to a file

File Size(in kb)	Time for Uploading file (in ms)	Time for Downloading file(in ms)
1	1.5	1
2	2	1.5
3	2.5	2
4	3	2.5

**CONCLUSION:-**An attribute -based privilege control scheme and a privacy preserving attribute-based privilege control scheme to address the user privacy problem in a cloud storage server. Using multiple authorities in the cloud computing system, our proposed schemes achieve not only fine -grained privilege control but also identity anonymity while conducting privilege control based on users’ identity information. More importantly, our system can tolerate up to  $N - 2$  authority compromise, which is highly preferable especially in Internet-based cloud computing environment. One of the future works is to introduce the efficient user revocation mechanism on top of anonymous Attribute Based Encryption. Supporting user revocation is an important issue in the real application.

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## JOINT PROPELLER SHAFT SPLINE AND KEYWAY BORE SUPPORTED IN TRANSMISSION SYSTEM ON COMMERCIAL VEHICLE

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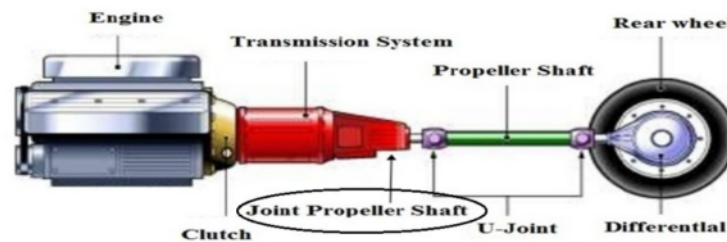
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**Abstract:** In Auto-Mobile Sector Commercial Vehicle is one type of motor vehicle. This is transport to goods and Passengers by road. Light, medium and heavy Duty sized commercial vehicles are used in transportation. For this transportation Commercial Vehicle required to more power. This power is generate to inform of Torque. Transmission system is widely used for generating power from a source and for transferring such power from the source to a driven mechanism. Frequently, the source generates rotational power, and such rotational power is transferred from this source to a rotatable driven mechanism. An automotive drive shaft transmits power from the engine to the differential gear of a rear wheel drive vehicle. Drive shafts are carriers of torque and are subject to torsion and shear stress, equivalent to the difference between the input torque and the load. They must therefore be strong enough to bear the stress. Joint Propeller shaft can be supplied as individual components or assemblies with connecting one end is gear box to another end is flange yoke than universal joint, Propeller Shaft and differential gear box, for proper torque transfer. It is important part in torque transmission line.

**Keywords-** Joint of Propeller shaft, Commercial Vehicle, Design.

**Introduction:-** In the present time, it is important to manage product innovation as well as development processes for the firms to survive in the market and for this, firms need modern tools as well as methodology that must be adopted. In process improvement methodologies, various methods are included such as changes in present manufacturing procedures or applying more training sessions in the manufacturing organizations. In the modern innovation as well as development processes, several companies are trying to adopt waste elimination philosophy of “Lean manufacturing concept”. It was also observed that in the innovation procedures, the application of Lean manufacturing concept is not that immediate as well as various problematic aspects are also presented. [1] The major challenge is that the critical differences cannot be distinguished between the two fields of applications. In 1988, John Krafcik aimed to focus on the results of “MIT International Motor Vehicle Program research” in a renowned article in which the term “Lean” is used first time for explaining the approach

of production management which requires less resources such as minimum warehouses for storage, less space and requires less working hours.[2]



**Figure:-1 Transmission System in Commercial vehicle & JP Shaft**

**LITERATURE REVIEW :-Dewangan et al.** They are analyzed industrial part on transmission system in commercial vehicle. Propeller shaft is transfer torque from gear box to rear wheel differential gear box. Its help to number of connection part from gear box, flange yoke, universal joint, and slip joint, propeller shaft and differential gear box. In their research design to Joint Propeller shaft incurred wobbling problem during transmission testing part.

**Hu et al. In their research, study to distribution for shear stress on V -Notch corner.** 135 weld toe notches are used for the tube-flange welded joints (TFWJs) and use to the method of Singularity Length Method” (SLM). For the stress calculation without using Finite Element Method behalf of the mode III notch stress intensity factor (NSIF K3)

**Raj et al.** studied that in knuckle joints measurement to dimensional accuracy a significant as well as voluminous research article is presented by the author in whom it includes degree of doubt, reduction in cycle time as well as proper placement of the knuckle part.

**Kondaiah et al.** In automobile and aerospace avoid for leakages than they are use to different types of bolted flange joints. External force apply on bolted joint so measurement, analysis and calculation than design to bolted joint. In aerospace bearing housings, casings and in aero-engine for the rotor of gas turbine, different types of bolted joints are used such as stepped flange, conventional back-to-back flange and triple stack flange.

**Mohrbacher et al.** analyzed that when one is working with the high strength steel, enhanced manufacturing technology is required. For the altered weld ability and formality, manufacturing technology has been adopted for the modern high strength steel. Therefore, as per the manufacturer’s point of view, it is considered as the passive approach. For enabling the efficiency gains and weight savings, a much more strong approach is needed for the generation of synergies in between the material, design and innovative manufacturing methods.

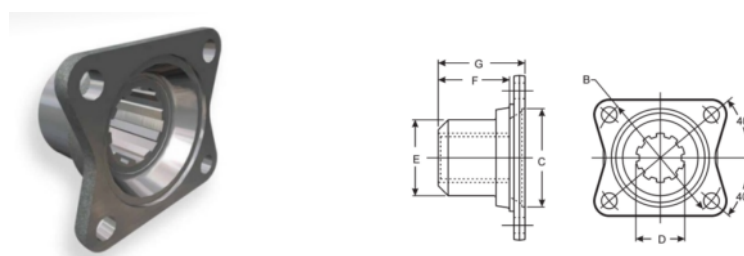
**Analysis on Joint Propeller Shaft:** - Transmission system is widely used for generating power from a source and for transferring such power from the source to a driven mechanism. Frequently, the source generates rotational power, and such rotational power is transferred from this source to a rotatable driven mechanism. For example, in most land vehicles in use today, an engine/transmission assembly generates rotational power, and such rotational power is transferred from an output shaft of the engine/transmission assembly through a driveshaft assembly to an input shaft of an axle assembly so as to rotatable drive the wheels of the vehicle. To accomplish this, a typical driveshaft assembly includes a hollow cylindrical driveshaft tube having a pair of end fittings, such as a pair of tube yokes, secured to the front and rear ends thereof. The front end fitting forms a portion of a front universal joint that connects the output shaft of the engine/transmission assembly to the front end of the driveshaft tube. Similarly, the rear end fitting forms a portion of a rear universal joint that connects the rear end of the driveshaft tube to the input shaft of the axle assembly. The front and rear universal joints provide a rotational driving connection from the output shaft of the

engine/transmission assembly through the driveshaft tube to the input shaft of the axle assembly, while accommodating a limited amount of angular misalignment between the rotational axes of these three shafts.

The output shaft of the engine/transmission assembly is typically embodied as a male splined member that is generally cylindrical in shape and has a plurality of outwardly extending splines formed on the outer surface. To connect the output shaft of the engine/transmission assembly to the front universal joint, a Joint Propeller shaft and flange yoke assembly is often provided. The Joint Propeller shaft and flange yoke assembly includes two physically separate components, namely, a Joint Propeller shaft and a flange yoke, that are secured together for concurrent rotational movement. The Joint Propeller shaft usually includes a hollow cylindrical sleeve portion and a disc-shaped flange portion. The sleeve portion of the Joint Propeller shaft has a plurality of inwardly extending splines formed on an inner surface thereof that cooperate with the outwardly extending splines of the male member so as to connect the sleeve portion to the output shaft of the engine/transmission assembly for rotational movement. The flange portion of the Joint Propeller shaft is formed integrally with the sleeve portion and has a plurality of apertures formed there through. The flange yoke usually includes a disc-shaped flange portion and a yoke portion. The flange portion of the flange yoke has a corresponding plurality of apertures formed there through that receive respective threaded fasteners to secure the flange yoke to the Joint Propeller shaft. The yoke portion of the flange yoke is formed integrally with the flange portion and has a pair of spaced apart yoke arms formed thereon that cooperate with a cross and the front end fitting of the driveshaft assembly to form the front universal joint.

Drive shaft Joint Propeller shaft are many types of available, they are help to transmute to torque from gear transmission system to rear wheel differential system. A companion flange is a flange that corresponds to another flange. Having bolt holes that align with another flange is a trait of this type of flange. The Joint Propeller shaft is an important component of a transmission shaft in automobile. In most situations, this flange is attached to the flange yoke, universal joint assembled, propeller shaft and rear wheel drive. Spine bore and keyway bore Joint Propeller shaft design analysis compared.

## SPLINE JOINT PROPELLER SHAFT



**Figurer:1 SPLINE JOINT PROPELLER SHAFT**

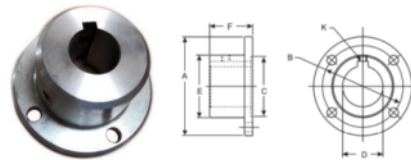
**Table:1 Dimension of Spline Joint Propeller Shaft**

Sr.No	Discription	Dimention	Sr.No	Discription	Dimention
1	Major Diameter (D) In.	1.500	10	Length Thru Hole (F) In.	2.000
2	Spline Count	10	11	Flange Face To End Of Hub (G)	2.625
3	Involute Spline	N	12	Joint Propeller shaft Assembly	N
4	Pilot Diameter (C) In.	3.750 - FEMALE	13	Material	Steel



5	Bolt Circle Dia.(B) In.(FL YK)	1.75	14	VMRS	024002040
6	Bolt Hole Diameter In (FL YK)	0.500 - DRILLED	15	Package Type	EACH
7	Number Of Holes (FL YK)	4	16	Package Qty	1
8	Brake Drum Pilot Diameter In.	3.750	17	Weight	3.04 LB
9	Ground Hub Diameter In.	2.125	18	Country of Origin	United State

## KEYWAY BORE JOINT



Figurer:2 key way Bore Joint

Table:-2 Dimension of Keyway Bore Joint Propeller Shaft

Sr.No	Discription	Dimention	Sr.No	Discription	Dimention
1	Brand	Spicer	13	Bolt Hole Diameter (In.)	.375 - DRILLED
2	Flange Type	Circular	14	Material	Steel
3	Series	1310	15	VMRS	024002040
4	Flange Width Diameter (A) In.	3.88	16	Actual Hole Diameter (Max)	1.376
5	Bolt Circle Diameter (B) In.	3.130	17	Actual Hole Diameter (Min)	1.375
6	Number Of Holes	4	18	Actual Keyway Width (Max)	0.314
7	Bore Diameter (D) In.	1.375	19	Actual Keyway Width (Min)	0.313
8	Key Width (K) In.	0.312	20	Package Type	EACH
9	Pilot Diameter (C) In.	2.375 - FEMALE	21	Package Qty	1
10	Set Screw Hole Diameter In.	0.375	22	Weight	2.49 LB
11	Hub Diameter (E) In.	2.438	23	Country of Origin	United States
12	Circ Flnge Face To End Of Hub	2.000			

**IV CONCLUSION:-**In this Analysis torque is transferring in rotational power form Engine gear box transmission assembly to a differential gear box assembly in a vehicle drive. In particular, this study relates to an improved structure for precisely positioning a Joint Propeller Shaft that, in turn, is supported on a splined shaft or Keyway Bore in such a transmission system. In heavy duty commercial vehicle required more power. This paper presents a simple analytical model based on an extension of the Taylor Forge approach taking into account flange rotation, flexibility of both splined shaft or Keyway Bore. The assembly defined in claim wherein said shaft has a first plurality of splines formed wobbling thereon and said hollow sleeve portion of said keyway bore, said first and second pluralities of splines cooperating with one another to connect said companion flange to said shaft. The existing design of Joint propeller shaft reduced wobbling problem is reduced during transmission system. After dimensional checking of part found spline or broaching is better than keyway boring in this boring shifted from its centre position. Joint propeller shaft by which part will not get rejected with the use of spline borin.

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## The role of Machine learning Techniques for the prediction of Cardiovascular Disease

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**Abstract:** Machine learning (ML) based applications have found usage across various domains. Utilizing the computing power of machines in diagnostics has been under exploration since decades. However, with progress in algorithms which simulate the human brain in function lot of research has been undergoing in the cardiovascular diagnosis domain. More specifically in the areas of risk detection. In this paper, the application of various Machine Learning Techniques in cardiovascular diagnosis has been analyzed. Though there have been significant positives by the use of ML algorithms in early disease detection and proactive treatment prescription, multiple challenges like data privacy, data hygiene and selection bias is also experienced. However, considering the merits that these technologies bring to mankind, Machine learning is transforming health care domain.

**Keywords:** Machine learning, Cardiovascular disease, health care

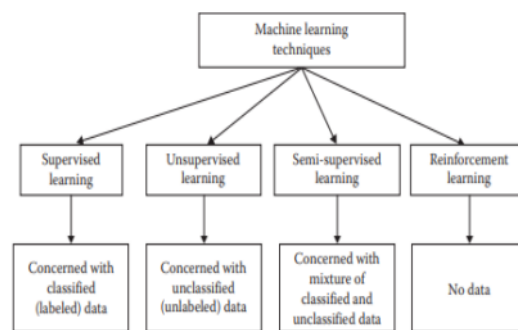
**INTRODUCTION :-** The heart, a hollow muscular organ about the dimensions of a fist which is liable for pumping blood through the blood vessels by repeated, rhythmic contractions. The oxygen and nutrients to the body is carried by pumped blood, while also carrying metabolic waste like carbon dioxide to the lungs. The main factors driving the rise in heart ailment are type 2 diabetes and obesity. Age, sex, pulse rate, diabetes, blood pressure and many more factors affect the heart condition. During the last three decades beginning 1990, coronary heart ailment alone has increased by 120% for women and 137% for men in developing countries. According to a report by WHO projected 17.9 million people died from CVDs in 2019, accounting to 32% of overall global deaths. Among these deaths, 85% were due to stroke and heart attack. [1] It is vital to distinguish cardiovascular infection as early as conceivable so that administration with guiding and medications can start. Cardiovascular diseases (CVDs) are a bunch of malfunctions of the heart and blood vessels.[1]

Diabetes mellitus, High blood pressure (BP), cigarette smoking and lipid variations from the norm are major modifiable hazard components for cardiovascular infection (CVD). Out of those, increased blood pressure is related to the solidest evidence for causation and features a high incidence of exposure. Be that as it may, there is considerable evidence that a biologically normal level of BP in humans is considerably lesser than what has been traditionally employed in clinical procedure and research, leading to a misrepresentation of the effect that blood pressure plays as a risk factor for CVD. Atherosclerosis, or plaque build-up within the blood supply routes is one of the prime unpretentious wellbeing issues related to untreated high blood pressure. When those blockages happen within the supply routes that supply blood to the heart muscle, the conclusion result is called coronary artery disease. People with increased blood pressure are more prone to have coronary illness, since high blood pressure puts amplified constrain against the supply route walls. Over time, this additional weight can harm the supply routes, making them more helpless to the narrowing of supply routes and plaque build-up related with atherosclerosis. The constricted course limits or curtails the stream of blood to the heart muscle, rejecting the heart of oxygen. When this is progressed sufficient, patients can develop angina, or chest pain, when they exert themselves.

The solidified surface of the course can moreover encourage the arrangement of little blood clots, possibly driving to a heart attack or stroke.

Over the years, novel medical advances and techniques have reformed the face of healthcare. The medical field has continuously brought together the most excellent and brightest of society to help those in need. From treating cancer and delivering babies to managing with heart attacks, doctors have created innovation and progressed treatment strategies. It is unreasonable for a common man to as often as possible experience expensive tests like the ECG and hence there has to be a framework established which is convenient and at the same time solid, in anticipating the chances of event of heart infection.

**Machine Learning** -Machine Learning in healthcare makes a difference to examine thousands of distinctive information focuses and propose results, give opportune hazard scores, exact asset allotment, and has numerous other applications. Machine learning connected to therapeutic records, in specific, can be a successful apparatus both to foresee the survival of each understanding having heart ailment side effects and to identify the most important clinical conditions or risk factors that may lead to heart failure. Machine Learning as an automatic method is employed by systems to find out from data, identify useful patterns and minimize human interference within the decision-making process. Supervised Learning and Unsupervised Learning are the two broad classification of Machine Learning algorithms. In this time of Data Science, Machine learning calculations are continually being utilized, over different areas, to pick up important experiences and use the mined data to form choices.



### Various machine learning techniques and their required data [2]

#### Supervised Learning [2]

In supervised learning, the goal is to deduce a function or mapping from training data that is labeled. The training evidence comprises of input vector  $X$  and output vector  $Y$  of labels or tags. A label or tag from vector  $Y$  is the description of its respective input example from input vector  $X$ . Together they form a training example. Meaning training data comprises training examples. If the labeling stops to exist for input vector  $X$ , then  $X$  is unlabeled data.

Two groups or categories of algorithms fall under the spectrum of supervised learning. They are:

1. Regression
2. Classification

#### Unsupervised Learning [2]

In unsupervised learning, we negate supervisors or training data, which means, all what we have is unlabeled data. The idea is to find a hidden structure in this data. There can be multiple reasons for the data not having a label. It can be due to inaccessibility of stores to pay for manual labeling or the inborn nature of the data itself. With various information collection gadgets, presently data is collected at an exceptional rate. The assortment, speed, and the volume are the measurements in which Big Data is seen and judged. To urge something from this information without the supervisor is critical. Typically this is the challenge for today's machine learning practitioner.

### **Semi-Supervised Learning [2]**

In this sort of learning, the given data are a blend of classified and unclassified information. This combination of labeled and unlabeled data is utilized to create a fitting demonstration for the classification of information. In most of the circumstances, labeled information is rare and unlabeled information is in abundance.

### **Reinforcement Learning [2]**

The reinforcement learning strategy points at utilizing perceptions assembled from the interaction with the environment to require activities that would maximize the reward or minimize the risk.

In order to produce intelligent programs (also known as agents), reinforcement learning goes through the following steps:

1. Input state is perceived by the agent.
2. Decision making function is utilized to create the agent perform an action.
3. After the action is completed, the agent obtains reward or reinforcement from the environment.
4. The state-action pair evidence about the reward is stored.

It is public practice to split the labeled data into two parts:

#### **1. Training data**

#### **2. Testing data**

A training set is utilized to construct the demonstrate and testing set is utilized to approve the built demonstrate. In hold out testing/ approval, one is anticipated to hold out portion of the information for testing. Bigger parcel of the information is utilized for demonstrate preparing reason, and the test measurements of the demonstrate are tried on holdout data.

Machine learning is a subfield of artificial intelligence. It is the study of computer algorithms which move forward naturally through involvement and by utilizing data.

#### ➤ **Classification techniques: -**

Classification is a task that requires the use of machine learning algorithm that learn how to assign a class label to examples from the problem domain.

Classification techniques are further classified into four:

- **NAIVE BAYES:** Naive Bayes classifier is amongst the simplest and most effective classification algorithms which helps in building the fast machine learning model that can make quick prediction. It is a probabilistic classifier, which suggests it predicts on the premise of the likelihood of an object.
- **DECISION TREE:** Decision tree learning or induction of decision trees is one of the predictive demonstrating approaches utilized in data mining, statistics and machine learning. It uses a choice tree to go from perceptions to conclusions around the item's target value.
- **SUPPORT VECTOR MACHINE:** In machine learning, “support -vector machines” are directed learning models with related learning algorithms that analyse data for regression and classification analysis.
- **K-NN:**K-NN stands for K nearest neighbour. In statistics, the “K -nearest neighbours’ algorithm (K-NN)” is a non-parametric classification method. It is used for regression and classification.
- **Random forest:** Random forest is an adaptable, simple to utilize machine learning algorithm that produces, indeed without hyper-parameter tuning, a great result most of the time. It is furthermore one of the principally utilized methods owing to its straightforwardness and diversity. It can be utilised for both regression and classification tasks.

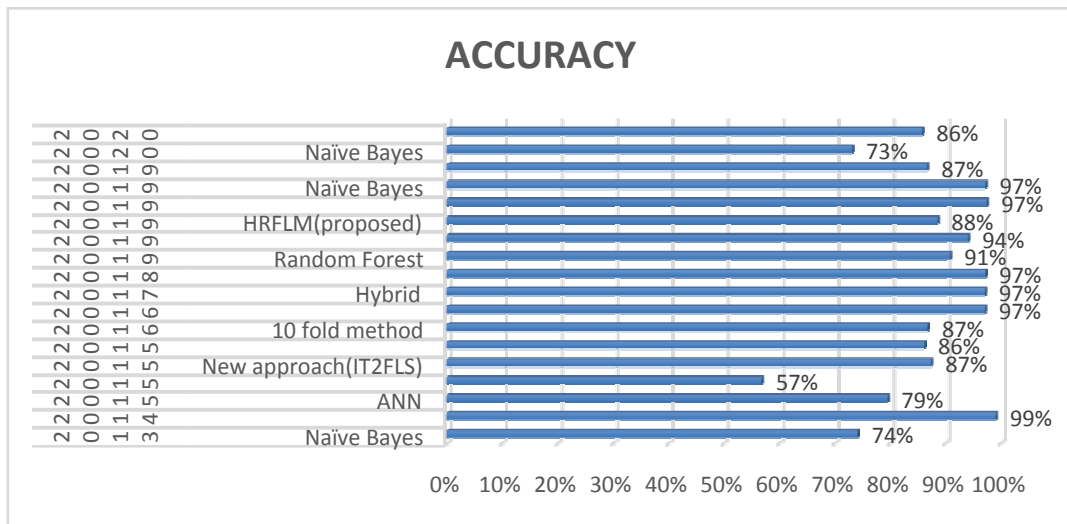
**Clustering techniques:-**Cluster analysis or clustering is the assignment of gathering a set of objects in such a way that objects within the same bunch are more comparative to each other than to those in other groups.

**K-Means clustering:** -“K-Means” is a clustering algorithm in machine learning that can bunch an unlabeled dataset very rapidly and productively in few em phases. It works by naming all instances on the cluster with the closest centroid.

**SOM:-** A “self-organizing map (SOM)” or “self -organizing feature map (SOFM)” is a type of artificial neural network (ANN) that's prepared utilizing unsupervised learning to c reate a low-dimensional, discretized representation of the input space of the preparing tests, called a map, and is hence a strategy to do dimensionality diminishment.

Sr.No	YEAR	AUTHOR	ALGORITHM USED	BEST ALGORITHM	ACCURACY
1	2013	VijayaraniMohan[3]	Naive Bayes,K-NN, Decision List	Naive Bayes	74%
2	2014	Hlaudi Daniel Masethe, Mosima Anna Masethe[4]	J48, REPTREE, Simple CART	J48	99%
3	2015	Andrea D'Souza[5]	ANN K Means Clustering	ANN	79.38%
4	2015	Jaymin Patel Prof.TejalUpadhyay Dr. Samir Patel [6]	J48,Logistic model tree, Random Forest	J48	56.76%
5	2015	Nguyen Cong Long , PhayungMeesad , Herwig Unger [7]	SVM, Naive Bayes, ANN, New approach	New approach(IT2FLS)	87.30%
6	2015	T. Santhanam and E. P. Ephzibah [8]	Genetic Algorithm,Stratified k fold technique	Stratified k fold technique	86.00%
7	2016	Purushottam[9]	10 fold method	10 fold method	86.70%
8	2016	AlirezaAlinezhad[10]	Neural network, Clustering algorithm	neural network	97%
9	2017	Kalyanikadam[11]	KNN, Hybrid, Naive Bayes	Hybrid	97%
10	2018	V VRamalingam[12]	SVM, KNN, Decision Tree, Random Forest, Ensemble Model, Naive Bayes	Random Forest	97.07%
13	2019	SenthilkumarMohan [15]	Naive Bayes, Genralized linear model, Logistic Regression, Deep Lerarning, Decision Tree, Random Forest, Gradient boosted tree, SVM, VOTE, HRFLM(proposed)	HRFLM(proposed)	88.40%
14	2019	AlirezaAlinezhad& MirupouyaMirmazaffari[16]	Apriori	Apriori	97.40%
15	2019	R Venkatesh & C Balasubramanian& M Kaliappan [17]	Naive Bayes	Naive Bayes	97.12%
16	2019	DR. S. Anitha [18]	KNN, Naive Bayes, SVM	Naive Bayes	86.60%
17	2020	Rami Mustafa A Mohammad[19]	Support Vector Machine, Decision Tree,Naive Bayes,	Naive Bayes	73%
18	2020	Komal Kumar Napa[20]	Random Forest, Decision Tree, Logistic Regression, Support vector machine, K - nearest neighbors	Random Forest	85.71%





**Conclusion:-**After analyzing these research studies spread over the last decade, it is evident that the accuracy level of different algorithms has attained high levels of reliability. Among these algorithms Random, Naive Bayes and J48 have exhibited superior performance in accuracy. Keeping in mind, the fact that extensive research in recent years is being done on Naive Bayes algorithm, it can be securely concluded that it is having the most excellent scope for exactness improvement.

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## Brain Tumor Detection using Thresholding Segmentation Technique

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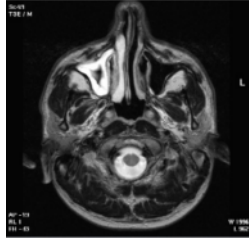
**Abstract:**-Medical Image Processing may be a complicated and challenging area in recent times. Processing of MRI image is one of the parts of this discipline. This paper proposes a method for green detection of a brain tumour in MRI brain images. The methodology consists of the subsequent steps: Pre-processing by using median filter & segmentation of the image is performed by thresholding. This technique is then accompanied via the further application of morphological operations. As part of the defined operations, the outputs are recorded. The recorded outputs are in a position to distinguish between the affected and the non-affected elements of the brain tumour. Pre-processing of MRI image comes under Medical Image Processing, which is a very complicated and challenging area but essential for green detection of a brain tumour in MRI brain images. This paper proposes pre-processing by using Median Filter and segmentation by Thresholding, further accompanied by morphological operations. The recorded outputs can distinguish the affected and the non-affected elements of the brain tumour very clearly.

**Keywords:** Median filter, thresholding, Morphological operation

**INTRODUCTION:**-The brain of a human being has most complicated structure as it includes billions of cells for handling hundreds of complicated functions performed by every human body. If such a brain is subjected to a serious accident, the uncontrolled group of cells affects the normal functionality of the mind and this is very likely to result in brain tumour [1]. Brain tumours can be non-cancerous or cancerous, but benign tumours. The non-cancerous tumours are non-progressive, so they may be considered as grade I, II whilst malignant tumours i.e. the cancerous tumours are of grade III, IV which expand unexpectedly. One more division of tumours is primary tumour and secondary tumour based on their authentic location. The tumours which originate due to the thoughts and increase slowly are considered as primary tumours and most of them are benign. The origin of well-known cancers cells is in different organs like breast, lung and they can spread originating due to thoughts in the mind as secondary tumours. A few tumours which arise from the glial cells are gliomas and meningiomas and are the most unusual tumours found in adults. The benign tumours sometimes take as long as 15 years to turn into malignancy but in maximum of the instances, they grow much faster. Such an analysis of Brain cancers mostly use application of the prevailing Magnetic Resonance Imaging (MRI) strategies having good accuracy compared to other detection schemes. Therefore, researchers tend to improvise the same introducing new mechanisms for accurate segmentation of the image, to achieve the partitioning of an image into smaller areas to identify extent of spread as well as exact location of abnormality along with cost effectiveness. Many strategies are available for image segmentation in the literature, and hence, it requires introducing yet other rapid medical image segmentation techniques. It's very crucial to use detection techniques such as morphological operators for MRI segmentation of brain tumour. In general, it includes the Input Image, Pre-processing, Segmentation, Feature Extraction and Classification. The proposed technique begins with reading of the MRI brain image as Input image. Then apply the pre-processing for image smoothing. The Image smoothing may be executed through Median Filter [4, 5]. The segmentation level is to phase the brain tumour by the use of thresholding algorithm. The performance of the proposed method is evaluated in terms of Accuracy, Specificity & Sensitivity to classify the MRI as abnormal or normal.

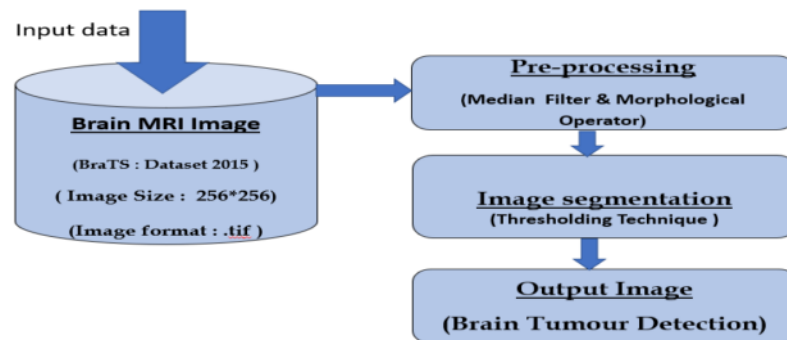
Morphological operators are applied to the output image which provides a better detection of tumour [6].

**II. PROPOSED METHOD** :-The proposed set of rules are designed to separate out the tumor place from brain tumor MRI image and to degree the level of tumor region. The brain tumor MRI image is as shown in figure1.



The major steps to be followed step by step for detecting the tumor efficiently in MRI images are shown in the flow graph shown in Figure 2 below.

- A. Pre-processing
- B. Segmentation
- C. Tumour Detection



**Figure 2 : Flow Graph for detection of tumor**

**A] Preprocessing:-**The MRI image of brain tumor is an entry point for this proposed set of rules. The MRI photograph is a blurred image as seen in Fig.1 due to presence of noise. Noise disturbances are mainly because of electronic imaging sensors, sensor temperature, insufficient degree of Light and channel noise. So preprocessing is essential for such images to make them sharper. So initially the entry point image is filtered

**Median Filter:-**There are linear and nonlinear varieties of filters. The nonlinear filters are median filter out, max filter out and min filter. Median filter smoothes the image simply by means of changing middle pixel intensity with the aid of the median of the neighborhood. In this proposed set of rules median filter is used. Median filter gets rid of the noise from an image, also enhance the image and make it sharper. This provides greater contrast image. The median filter does not require convolution. The center pixel replaced via the median of the pixel values below the filter out.

**Morphological operation:-**The goal of the usage of morphological operations is to eliminate the imperfections inside the structure of photo. Morphological operations are simple to use and works on the basis of set idea. Most of the operations used here are aggregate of two tactics, dilation and erosion [6]

**B] Segmentation:-**Segmentation is the method of partitioning a digital image into more than one segment (units of pixels, additionally known as notable pixels). The purpose of segmentation is to simplify or alter the image into a meaningful image for analysis. Image segmentation is normally used to locate gadgets and boundaries (strains, curves, etc.) in images [8]. More exactly, image segmentation is the approach of assigning a label to every

pixel in an image such that pixels with the identical label share positive visual traits. Each of the pixels in a location is identical in few features or computed similarities inclusive of coloration, depth, or texture. Adjacent regions are considerably different with appreciable similarities. The simplest approach for image segmentation is referred to as the thresholding approach [9]. This technique is based totally on a threshold cost to turn a gray-scale image right into a binary image. More exactly, photograph segmentation is the approach of assigning a label to every pixel in a photograph such that pixels with the identical label share positive visual traits.

### III - IMPLEMENTATION

**Required dataset :-**The MRI images obtained from Barts 2015 are used to evaluate the accuracy of the proposed approach. There are 32 images in the database which contain 16 abnormal and 16 normal (with and without tumor resp.) brain MRI images. All images contain 256 x 256 pixels, show 8-bit grayscale and are in tif format

#### Framework execution

In this all pixels within the database have been examined to evaluate the accuracy, sensitivity and specificity using the subsequent attributes within the calculations.

- A (True Positive): Existing tumor and detected correctly.
- B (True Negative): Non-existing tumor and not detected.
- C (False Positive): Non-existing tumor and detected.
- D (False Negative): Existing tumor and not detected.

Sensitivity is the measure of successful determination of the person having a tumor.

$$\text{Sensitivity}(\%) = A/(A + D)$$

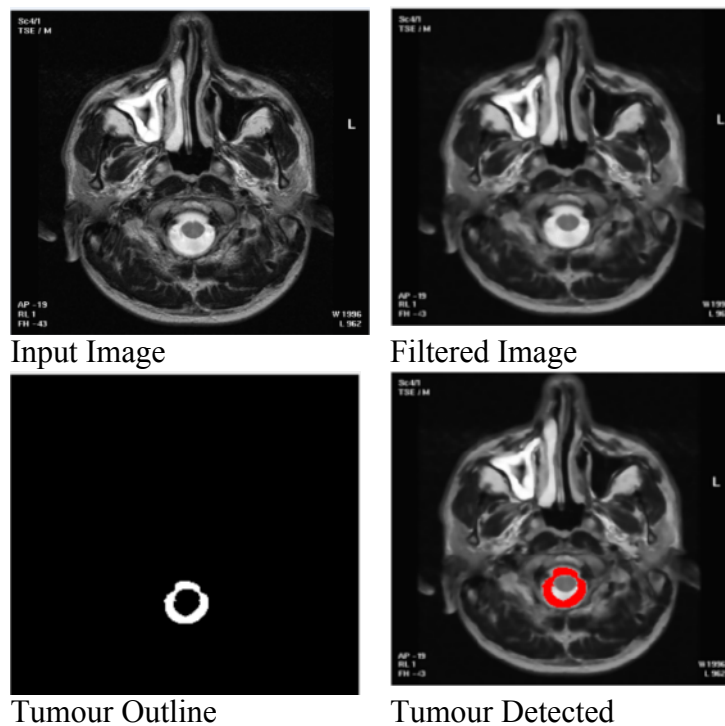
Specificity is the measure of successful determination of the person not having a tumor.

$$\text{Specificity}(\%) = B/(B + C)$$

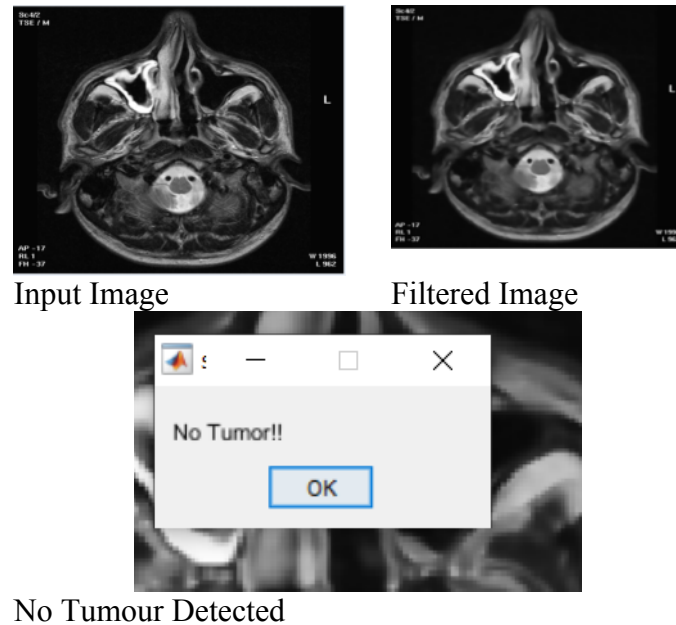
Accuracy is the measure of successful classification.

$$\text{Accuracy}(\%) = A + B/(A + B + C + D)$$

### IV FIGURES AND TABLES



**Figure 3 Experimental Results**



**Figure 4 Experimental Results**

**Table No 1: Performance of proposed system**

Total Image	A	B	C	D	Sensitivity	Specificity	Accuracy
32	16	15	0	01	94.11	93	96

Out of 32 images with the tumor 31 images evaluated correctly by the system. Other 1 image is identified as without a tumor incorrectly. The reason of this malfunctioning was due to the fact that there is no clear distinction between the tumor area and the rest of the brain in terms of intensity of the pixels. 15 images without a tumor were correctly identified by the system as images without a tumor.

**V. CONCLUSION:-** Developed System in this study is an aid for the medical people to diagnose the brain cancer using MRI images. The images obtained from bars data set 2015 are used in this study. Morphological processing technique has proved miraculously beneficial in various picture extraction and filtering strategies. The morphological operators can exchange the structured factors of the image in step with their use. Some operators like open, spur, dilate and close have proved beneficial in extracting the mind tumour from the MRI brain pictures. Pre-processing of the MRI became achieved the use of filtering techniques. Threshold segmentation became used to paintings on the desired location of the image. The proposed approach has 94.11% Sensitivity rate on the images with a tumor and 93% Specificity rate on the ones without a tumour. The overall success rate of our system is 96% which shows a better performance in comparison.

#### **Future Scope**

For the future work, there are two issues that are to be improved in our system. First one is the inaccurately classified images that have a tumour. Here maybe different methods of classification like neuro-fuzzy or support vector machine, PCA Fuzzy Teaching Algorithm should be tried

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## **A study to assess the effectiveness of structured teaching programme on knowledge of Cervical cancer and its prevention among Staff Nurses working in a selected cancer Hospital, Delhi**

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**ABSTRACT:** Cancer, a dreadful disease, has a relentless, very painful and debilitating course and if not treated in time, results in death. Cancer has become one of the ten leading causes of death in India. In modern era where urbanization, industrialization, lifestyle changes and population growth etc are influencing the disease pattern. Recent times have seen a decrease in cervical cancer incidences but very low decline has been observed.

**KEYS:-**Cervix-Lower part of the uterus, STP -Structured Teaching Programme, Pap smear-Papanicolaou smear.

**INTRODUCTION:-**The cervix is the lower portion of the uterus that connects the uterus to the vagina. Cervical cancer occurs when cells in the cervix grow erratically and multiply out of control. Both pre-cancerous and cancer cells in the cervix can be detected with a Pap Smear test used to examine cells from the cervix and the vagina. Cervical cancer is completely preventable but only obstacle is lack of awareness and lack of facilities.

### **OBJECTIVES OF THE STUDY:**

- To assess the level of knowledge of cervical cancer and its prevention among Staff nurses working at cancer hospital before the administration of structured teaching programme.
- To evaluate the effectiveness of structured teaching programme on cervical cancer and its prevention.
- To find out the association between knowledge of cervical cancer, its prevention and selected demographic variables.

### **HYPOTHESIS:**

- H1-There is a significant difference in the effectiveness of structured teaching programme of Cervical cancer and its prevention among staff nurses at the level of  $\leq 0.5$

### **ASSUMPTIONS:**

- Staff nurses may have certain knowledge regarding cervical cancer and its prevention and can be measured by structured knowledge questionnaire.
- Staff nurses must have had pap test and cervical cancer prevention vaccination.

### **DELIMITATIONS:**

- Staff Nurses available at the time of data collection.
- Staff Nurses working at cancer hospital.

### **OPERATIONAL DEFINITIONS:**

- **Knowledge:** It is the appropriate response received from the staff nurses to items regarding cervical cancer
- **Cervical cancer:** Patient admitted to treat cervical cancer at Selected Research Set up.
- **Effectiveness:** It is the significant gain in the knowledge as determined by the pre-test and post-test scores on cervical cancer among staff nurses working at selected cancer hospital.
- **Structured Teaching Programme :** Systematically organized series of teaching content on cervical cancer & prevention for staff nurses.

**MATERIALS AND METHODS:**

- **Research approach:** Evaluative Research approach
- **Research Design:** One group Pre-test Post-test experimental design.
- **Sampling Technique:** Purposive Sampling Technique
- **Sample size:** 30 staff nurses
- **Population:** Staff nurses working at Action Cancer Hospital
- **Variables Under study:**
  - **Independent variable :** Structured Teaching programme on Cervical Cancer and its prevention.
  - **Dependent variable:** Knowledge on Cervical Cancer and its prevention.
- **Research Setting:** Action Cancer Hospital, Delhi

**CRITERIA FOR THE SELECTION OF SETTING:**

- Familiarity with the setting
- Availability of the subject

**DESCRIPTION OF THE TOOL**

- **Section I :** Socio Demographic variables Age, Marital status, type of family, family history of cervical cancer, have you ever done PAP smear
- **Section II:** Structured Questionnaire to assess knowledge on Cervical cancer, **Range of score and the level of knowledge: 0-5 (Poor Knowledge), 6 -10 (Average Knowledge), 11-15 (Good Knowledge)**

**TOOL FOR DATA COLLECTION:** -Designed in discussion with H.O.D Gynae Onco & H.O.D Medical Onco, Nursing Superintendent.

**RELIABILITY OF THE TOOL:** -It was calculated by KR -20 Formula, too 1 was found reliable

**ANALYSIS & INTERPRETATION OF DATA:****SECTION I: SOCIO DEMOGRAPHIC CHARACTERISTICS**

**Table1: Frequency and percentage distribution of selected socio-demographic variables. N=30**

S.NO	VARIABLES	FREQUENCY	PERCENTAGE
1.	Age in years		
	a) $\leq$ 21 Years	0	0%
	b) $\geq$ 22 Years	30	100%
2.	Marital status		
	a) Married	07	23.3%
	b) Unmarried	23	76.6%
3.	Type of Family		
	a) Nuclear	18	60%
	b) Joint	12	40%
4.	Family history of cervical cancer		
	a) Yes	0	0%
	b) No	30	100%
5.	Have you ever done PAP Smear		
	a) Yes	0	0%
	b) No	30	100%

Table 1 reveals that all 30 (100%) nurses were from the age group  $\geq$  22 Years. Majority of them 23 (76.6%) were unmarried whereas only 07 (23.3%) nurses were married. Most of the

Nurses 18 (60%) were living with a Nuclear family, only 12 (40%) nurses were living with joint family. None of them 0 (0%) had cervical cancer history at family and also none of them 0 (0%) ever done a PAP smear

## SECTION II: ASSOCIATION BETWEEN KNOWLEDGE SCORE & SELECTED DEMOGRAPHIC VARIABLES N=30

The Chi square values obtained to seek association between knowledge scores and selected demographic variables showed that there is significant relationship between age, marital status and family history of cervical cancer and there is no significant relationship with type of family and whether they had done a pap smear

$P \leq 0.05$ , NS-Non significant

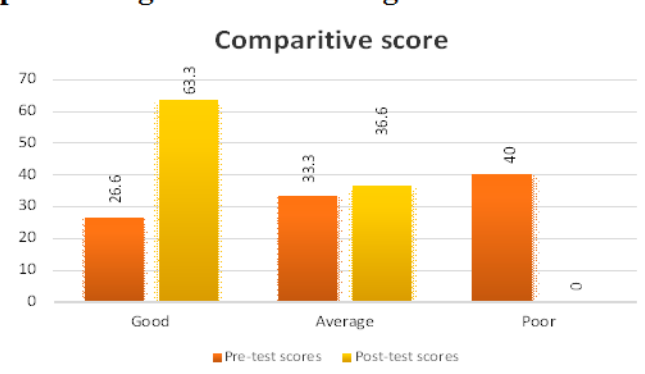
## SECTION III: COMPARISON OF PRE-TEST & POST-TEST KNOWLEDGE SCORE

LEVEL OF KNOWLEDGE	Pre-test		Post-test	
	Frequency	Percentage	Frequency	Percentage
Good Score (11-15)	8	26.6%	19	63.3%
Average score (6-10)	10	33.3%	11	36.6%
Poor score (0-5)	12	40%	0	0%

Data depicted in the above table with pre-test knowledge scores shows that majority of staff nurses had Poor score 12(40%), 10 (33.3%) had average scores and only 8 (26.6%) nurses had Good knowledge about Cervical cancer and its prevention.

While the post-test score shows the knowledge level has improved after structured teaching programme. The majority of the nurses had attained 19 (63.3%) as good score, 11 (36.6%) as Average score and none of them 0 (0%) had attained poor score.

**Figure 1: Bar Graph showing level of knowledge scores in Pre-Test and Post-Test**



## SECTION IV: ASSESSMENT OF EFFECTIVENESS OF STRUCTURED TEACHING PROGRAMME ON KNOWLEDGE SCORES:

Mean, Standard deviation, mean difference, d.f and 't' value of pre-test post-test knowledgescores N=30

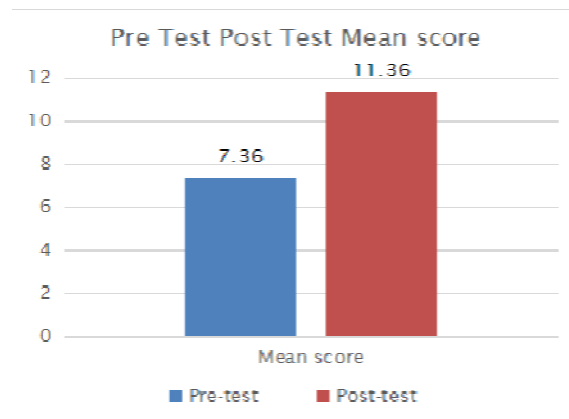
Knowledge score	Mean	Mean diff	SD	Df	't' value	Table value
Pre-test	7.36		4.1			
		4.3		29	2.9	2.04
Post-test	11.36		1.9			

### $p \leq 0.05$ , S-Significant

Data in the table; represents that the pre-test mean score was 7.36 which has increased in posttest i.e., mean was 11.36. The mean difference was 4.3. The computed 't' value was 2.9 at degree of freedom 29 which was more than the table value 2.04. This indicated that there was significant difference in pre-test and post-test scores after administration of STP at the level of  $p \leq 0.05$ , Which indicates that the Hypothesis H1 is correct and accepted.

### PRE-TEST POST-TEST MEAN SCORE

**Figure 2: Bar graph showing Pre-Test and Post-Test Mean score**



### CONCLUSION:

- The present study attempted to find out the efficacy of STP on staff Nurses about Cervical cancer and its prevention. 30 staff nurses of Action Cancer Hospital were sample of the study.
- The self-structured questionnaire was used to assess the level of knowledge. The Pre-test was taken afterwards planned teaching programme was given. Post -test was taken after 5 days.
- Result suggested, there was a significant improvement in the knowledge score after the teaching programme.

### IMPLICATIONS & RECOMMENDATIONS:

#### Nursing Practice:

- Teaching the patients, attendants and general public regarding Cervical cancer and its prevention, Nurses must get their PAP smear test done and must take cervical cancer vaccinations.

#### Nursing Education:

- Special training must be included on the Cervical cancer to reduce its risk.

#### Nursing Administration:

- Education for updating all nurse's knowledge about cervical cancer & its prevention can be offered at the time of joining with the help of Gynae Oncology Doctors.

#### Nursing Research:

- Similar study can be conducted on knowledge of cervical cancer and its prevention on a larger scale and an information booklet can be distributed.

#### Community related Implications

- Community Nurses must teach both high risk and low risk women in their community regarding cervical cancer screening & prevention.

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## **A study to evaluate the effectiveness of Information Education Communication regarding reproductive health and adolescent changes among adolescent girls at selected Pre University College at Hassan.**

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**ABSTRACT:-**Reproductive health and adolescent changes are the most important aspect for the adolescent's girls. A pre experimental design was conducted to identify the knowledge among adolescent girls and assess their knowledge in a selected pre university college at Hassan in Karnataka. By using convenient sampling, 60 samples were selected. A structured questionnaire was used. The study findings were revealed that during the pre test 85% had inadequate knowledge, 15% had moderate level of knowledge, and none of them had adequate level of knowledge. After the educational programme the knowledge level enhanced 28% had inadequate, 67% had moderate, and 15% had adequate level of knowledge.

**Key words-** Knowledge, Adolescents, Reproductive Health

**INTRODUCTION:-**Adolescent is an important resource of any country. They have successfully passed the adolescence of early childhood and are on their way to adulthood. On this way they may face troubles due to lack of right kind of information regarding their own physical and sexual development. Indian society had been a meeting point of different culture. It has been assimilated many other cultures, sex is not considered as a subject for general discussion and is also found regarding sex education. Teenagers role models are their peers and television and movies personalities not their parents, older siblings or teacher. The reproductive health for adolescent girls components are included a s anatomy and physiology of female and male reproductive system and sexuality, menstrual hygiene, awareness about the contraceptives and sexually transmitted disease and reproductive tract infection. Adolescents gather information about sexuality from friends and through the print and electronic media. Often this information is wrong and un scientific. They have great curiosity and concern about the sexuality of their own and of their own and of the opposite sex. Adolescents often have either access to accurate information on the issues related to sexuality and sexual health, nor solution for their problems due to socio cultural barriers .So the need to understand and impart the knowledge on sex education among adolescent is very vital to bring changes in attitude and practice, thereby helping to reduce antisocial sexual activities and bring positive focus on sexual health.

### **OBJECTIVES**

- ❖ To assess the pre test level of knowledge regarding reproductive health and adolescent changes among adolescent girls.
- ❖ To assess the effectiveness of information, education, communication on level knowledge regarding reproductive health and adolescent changes among adolescent girls.
- ❖ To associate the pre test level of knowledge on reproductive health and adolescent changes among adolescent girls with selected demographic variables.

### **HYPOTHESIS**

**H1:** There is a significant association between pre test and post test knowledge score regarding reproductive health and adolescent changes.



**H2:** There will be a significant association between pre test knowledge score and demographic variable.

**METHODOLOGY:-**The research design selected for this study was pre experimental design.

**Setting of the study:** -The study was conducted in Government pre university college, Hassan, Karnataka state.

**Population:-**The target population for this study was pre university students and the accessible population was pre university students who were coming to Government pre university college, Hassan, Karnataka state.

**Method of sampling:-**Convenient sampling technique.

**Sample size:** -The sample size was 60

**Criteria for sample selection:**

**Inclusion criteria**

- ❖ Adolescent girls who are age between 17 to 19 years
- ❖ Adolescent girls who are able to read and write English, Kannada.
- ❖ Adolescent girls who are present at the time of data collection.

**Exclusion criteria**

- ❖ Those who are not willing for the study.
- ❖ Adolescent girls who are undergone training programme.
- ❖ Girls who are deaf and dumb

**Description of the instrument:** -The tool used for the present study was structured questionnaire. It was prepared with the help of literature, expert opinion were obtained to ascertain the effectiveness.

**Part-1:** It consists of demographic data of pre university students Age, type of family, Habitant, Religion, and Education of the parents.

**Part-2:** Questionnaire to assess the knowledge of adolescent, regarding reproductive health and adolescent health.

It consists of 20 questions.

**Scoring procedures:** -There are 20 questions and maximum score was 20. Each correct answer was given a score of 1 and incorrect answering 0.

**Validity and reliability of the tool:** -A structured questionnaire was developed by the investigators based on the review of literature. This was checked and evaluated by experts. Depending upon their valid suggestions and guidance reframing the tool was done. The reliability of the tool was calculated by using split half method formula and was found to be highly reliable,  $r=0.8$ .

**Method of data collection:** -Initially the researcher developed with good communication with the sample. Self introduction to the respondent in simple language with clearly explained the purpose of data collection also, willingness of the participants were collected through consent form. After the complete verbal explanation the assurance was given to the sample that the confidentially will be maintained. Pre test was done through the administered structured questionnaire followed by pre test education intervention programme was conducted after 7 days post test was conducted. After the completion of data collection opportunity was given to clarify their doubts with the researcher.

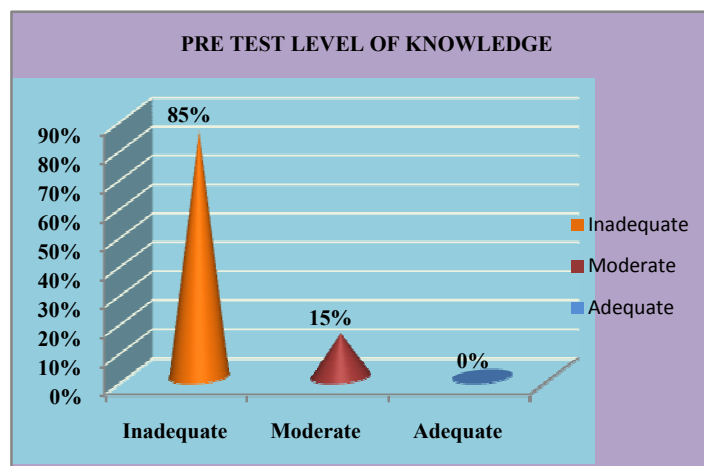
**Plan for data analysis:** -The demographic variables was analysed by using descriptive statistics such as frequency, percentage, and mean. Inferential statistics was used to analyze the significance of teaching programme and to analyze the association between the knowledge and selected demographic variables.

**Data analysis and interpretation.**

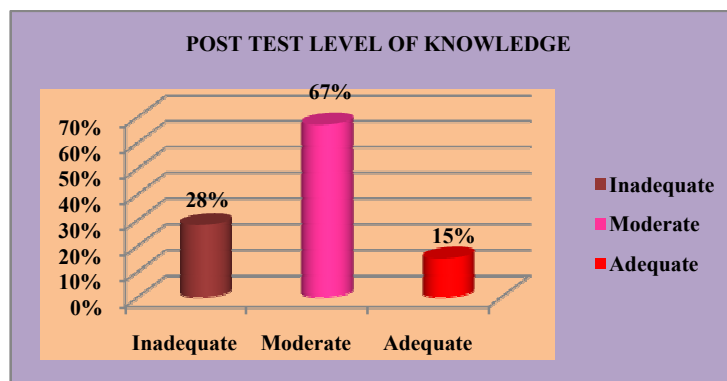
**Table 1: frequency and percentage distribution of demographic variable**

Demographic variables	frequency	Percentage
<b>1.Age</b>		
16-17years	6	10%
18-19 years	37	62%
Above 19years	17	28%
<b>2.Type of family</b>		
Nuclear	22	37%
Joint	26	42%
Extended	12	21%
<b>3.Habitant</b>		
Rural	37	62%
Urban	19	32%
Semi urban	4	06%
<b>4.Religion</b>		
Hindu	41%	68%
Christian	07%	12%
Muslim	12%	20%
<b>5.Income</b>		
<10,000	34	57%
10,000-20,000	20	33%
>20,000	6	10%
<b>6.Education of the parents</b>		
Primary education	42	70%
Higher education	12	20%
Graduate	06	10%

**Figure 1:**



**Figure 2:**



**CONCLUSION:-**From the finding of the present study, it was concluded that the level of knowledge of adolescent girls regarding adolescent changes and reproductive health was inadequate during pre test. However, the finding of the post test revealed that, the level of

knowledge has improved. The improvement was due to administration of information, education, and communication. Therefore knowledge of the adolescent girls could be further improved by providing ongoing, educational programme out of the several demographic variables; some of the demographic were associated with the pre test knowledge score.

### **NURSING IMPLICATION**

**Nursing service:** Nurses are responsible to make intervention to improve the knowledge of the adolescent regarding reproductive health and adolescent changes. Health education is an important aspect for health care agency.

**Nursing education:** The nursing experts must give more importance for planning and organizing the teaching programme to improve the knowledge regarding the reproductive health and adolescent changes.

**Nursing research:** There is a need to conduct studies on experimental basis to identify the knowledge, attitude among adolescent.

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# ENHANCEMENT OF PERFORMANCE WIRELESS INDOOR POSITIONING SYSTEMS USING BLUETOOTH LOW ENERGY

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## ABSTRACT

After a brief introduction, it was followed by a review of indoor localization techniques and wireless communication technologies. The goal of this research is to increase awareness of the many localization techniques and technologies that are used in indoor environments. Specifically, A survey of the technologies utilised in localization systems is provided in the research. These technologies include satellite -based navigation systems, inertial navigation systems, magnetic -based navigation systems, sound -based technologies, optical -based technologies, and radio -frequency (RF) systems. There is also in -depth discussion of localization detection techniques, including proximity -based approaches, scene analysis, triangulations, as well as dead reckoning methods. As a conclusion, the paper discusses some of the most commonly used localization algorithms and methods, including the angle of arrival (AOA), the time of arrival (TOA), and the strength of the received signal , among others (RSS). Several factors affect the selection of a localization technique, including the cost, available resources, the nature of the environment, and the degree of precision required; the most powerful strategy is one that provides high accuracy while using the least amount of processing.

**Keywords:-**Bluetooth lowenergy, living patterns, indoor localization etc.

## INTRODUCTION

Recent years have seen significant progress in the development of Bluetooth Low Energy (BLE) localization systems based on wireless sensing technologies, with notable applications in navigation, human mobility, life pattern mining, and location -based services. As the use of ubiquitous smart sensing becomes more widespread, human mobility patterns and trajectory mining are emerging as promising study topics for learning and finding human activities and living patterns [1]. Additionally, GPS technology [2] may be able to offer a high degree of accuracy for sensing outside activity, in addition to precisely geolocating people. The assessment of outdoor living activities has been the subject of many research that have been performed and published [1, 3]. While GPS technology may be used to monitor outside activities, it cannot be utilised to track inside actions since it cannot penetrate through walls and floors. As the world's population continues to age, there has been increased interest in monitoring and helping individuals suffering from dementia and other disabilities who are housed [4]. [5. Over the last several decades, there has been a substantial rise in the number of elderly individuals. [6] The European Commission estimates that between 1995 and 2025, the number of individuals over the age of 60 would increase by 44 percent in the United Kingdom alone [7]. As a result of an ageing and handicapped population [7], health -care systems are faced with a major problem [14, 15]. In the field of home rehabilitation, it is becoming more important to understand the requirements of elder users, their caregivers, and clinical staff [8]. According to the National Human Activity Pattern Survey [9], people spend the vast majority of their time inside (\_90 percent), for example, at their place of employment or at their place of residence. As a result, indoor monitoring is widely sought for by a diverse range of individuals. When a user has an unusual occurrence (such as a fall at home or an epileptic seizure), it is critical to understand the user's inner routines in order to recognise it (particularly in the case of fragile or elderly individuals or people living with dementia).

Monitored home usage over time may aid in clinical decision -making and diagnoses, as well as offer a better knowledge of chronic diseases such as dementia and neurological disorders, among other things.

## **LOCALIZATION SYSTEMS TECHNOLOGIES**

### **Satellite Based Navigation**

External localization is accomplished via the use of several technologies, the most widely used of which is the global positioning system (GPS). But there must be a clear direct line of sight (LOS) between the satellites and the portable device. As a result, internal location -based services become ineffective, particularly when exterior barriers are erected [14]. With the use of a steerable high gain directional antenna connected to the front end of a GPS receiver [14], it is possible to make use of the GPS system. [Pages 14 and 15] The use of pseudofiles (sometimes known as pseudo satellites) as a replacement for GPS signals is common in areas where GPS signals cannot be received [15]. These systems contain pseudofiles, transmission and receiving antennas, target receivers, and a reference, among other things. For a GPS signal to be received and duplicated via internal transmitters, it is necessary to realise the fundamental idea.

### **Inertial Navigation System**

When calculating the position and direction of objects in relation to their starting location, velocity, and angle, inertial measurement units (IMUs) such as an accelerometer and a gyroscope are used; the system is referred to as an inertial navigation system [17]. (INS). Inertial navigation systems (INS) benefit from the fact that they are positioned on the surface of the object [18], increasing their accuracy and energy efficiency. While mistakes may be present in the INS, more complex filtering methods, such as those used by the Kalman filter [19], may be necessary to correct for them. Another disadvantage of using the INS is the expense and time required to establish the position sensor's network infrastructure [20]. [See Figure 1 for an illustration.] [21] describes a new method for determining a starting location that makes use of existing WiFi routers and iBeacons in order to provide a more accurate estimate than previously available. iBeacons and inertial sensors are used in conjunction with iBILL, according to [22], a technology that has been suggested. It has two modes of operation: one for locating iBeacons and another for locating particle filter locations (PFL). PFL's processing overhead is reduced through the use of iBeacons, which allow it to deal with magnetic field changes more effectively. As a result, when walking, there are no cumulative mistakes to worry about. When the iBILL system was assessed, it was compared against the Magicol system (which used geomagnetism and inertial sensors), as well as dead reckoning methods (DR). It has been discovered that iBILL prevents mistakes from rising linearly with walking distance and performs much better than prior systems in this area of research. It is proposed in [23] that a hybrid localization method be developed by integrating inertial sensor -based dead reckoning with aural localization techniques. The hybrid localization system is then fused using the Kalman filter, which is implemented later. Researchers discovered that the suggested systems outperform stand -alone systems and surpass the limitations of their predecessors. [24] describes a hybrid system that uses WiFi fingerprinting in conjunction with inertial sensors, and the suggested technique outperforms the separate approaches that were tested.

### **Magnetic Based Navigation**

Low frequency localization is accomplished via the use of magnetic -based techniques. Following the emission of magnetic fields from at least three different reference magnetic stations, trilateration is utilised to determine the sensor's estimated position. A magnetic sensor is used to detect the radiated fields, and trilateration is utilised to determine the location of the sensor. Despite the fact that it is accurate at low frequencies, it is sensitive to conductive and ferromagnetic materials and should be used with caution in these situations.

Most magnetic -based navigation systems rely on disruptions in the Earth's magnetic field caused by the ferromagnetic composition of metal structures found in buildings to function properly. Because of this, magnetic maps are created by recording the magnetic field at known places; these maps may then be used to deduce the position of an unknown target based on the magnetic field measurement of the unknown target. Magnetic maps are generated as a result of this process. Magnetic fingerprinting is the term used to describe this technique. Magnetic interference, on the other hand, may be substantial and cause problems when trying to pinpoint a location. Because the use of several handsets along the same route may result in the recording of inconsistent magnetic readings, the use of cellphones for location reasons is a controversial practise, especially in urban areas. Researchers from [30] investigated localization using deep learning and discovered that accuracy was 0.8 metres in corridors and 2.3 milli metres in the atrium when using deep learning. Significant changes in the magnetic field are conceivable as a result of the widespread deployment of magnetic -only localization devices across vast regions [22], owing to the widespread deployment of magnetic-only localization devices over large areas. To improve accuracy, numerous hybrid methods have been investigated. For example, a hybrid technique for localization, which incorporates both a magnetic sensor and an inertial sensor, enables a user to use his or her smartphone without restriction while localization is performed with an accuracy of 1 –2.8 m. As long as the mobile phone is held in an upright posture, cameras and magnetic fields may be used in conjunction with neural networks to enhance the accuracy of location determination. Their suggested technique obtained an incredible accuracy of 1.34 m at a rate of more than 91 percent, which is really remarkable.

### **Beacons**

It was shown at the 2013 Apple Worldwide Developers Conference as a means of connecting with other devices. Apple created and showed this protocol in 2013. Beacons are a type of Bluetooth low energy (BLE) device that broadcasts its identity to other Bluetooth low energy (BLE) devices in the vicinity. A large number of manufacturers have now developed iBeacon-compatible hardware transmitters – also known as beacons – that are compatible with the protocol.

When a smartphone, tablet, or other device comes close enough to an iBeacon, the technology allows the device to execute a function as a result of the proximity. With the help of an application's ID and a few bytes transmitted with it, the device's actual location may be determined, consumers are monitored, or a location -based action on the device, such as a check-in on social networking or a push message, can be initiated. Additionally, when used in conjunction with an application, iBeacon may be utilised as an indoor locating system, enabling smartphones to identify their approximate location or context in an interior environment. When a smartphone is in close proximity to an iBeacon at a shop, the software on the phone may identify its relative position to the iBeacon with a high degree of accuracy. The usage of beacons for mobile commerce is becoming more popular among brick -and-mortar businesses, who are able to offer special offers to consumers via mobile marketing campaigns.

### **Trackers**

Tracking devices equipped with Bluetooth Low Energy receivers are referred to as BLE nodes, and they are deployed at predetermined locations around a venue. The BLE beacons may be moved, while the trackers must remain in place. Beacons using Bluetooth Low Energy (BLE) technology may be attached to objects and carried by humans. Each beacon is programmed in such a way that it must be able to recognise an item or a person. When three or more Bluetooth Low Energy nodes detect the same beacon, the system may triangulate the beacon's position and determine its location. The Bluetooth beacon tracker has a dashboard that allows for system administration and management to be carried out. The BLE nodes are



distributed around the building in a grid arrangement. While iBeacons roam the streets, broadcasting their unique IDs, Bluetooth Low Energy (BLE) nodes gather client ads and upload them to the server. The server then calculates the position of the clients in relation to the BLE nodes. The ESP32 is a mix of Bluetooth Low Energy and Wi-Fi technology that is used to receive RSSI signals from iBeacon.

### **Python Software Python**

Python is a high-level, interpreter-based computer language that may be used for a wide range of general-purpose applications. Because of the significant use of whitespace in Python, which was developed by Guido van Rossum and released for the first time in 1991, it has a design philosophy that prioritises readability. As a result, it offers frameworks that allow declarative programming to be used both locally and globally. In addition to a dynamic type system and automated memory management, Python has a number of additional features. There are many programming paradigms supported, including object-oriented, imperative and procedural programming, and it comes with a big and comprehensive standard library. Python interpreters are available for a wide range of operating systems, including Windows and Linux. In the same way that Python, the standard version of Python, is free and open-source software created collaboratively, almost all of its alternative implementations, including the Python programming language itself, are also free and open-source software. Python is overseen by the Python Software Foundation, which is a non-profit organisation that manages the language.

### **CONCLUSION**

It started with a general review of indoor localization methods and wireless technology, followed by questions and answers. Ultimately, the goal of this study is to raise public knowledge of the many localization methods and technologies that are available in indoor settings. As a result of the study, an overview of the technologies that are used in localization systems is provided, including satellite- and inertial-based navigation, magnetic-based navigation, sound-based navigation, optical-based navigation, and radio-frequency (RF) navigation. In addition, methods for localization detection are thoroughly examined, including proximity-based approaches, scene analysis, triangulations, and dead reckoning, amongst other techniques. The article concludes with a discussion of the most often used localization algorithms and techniques, which include angle of arrival (AOA), time of arrival (TOA), and the intensity of the received signal (RSS). This decision is influenced by a variety of factors, including cost, availability of resources, type and precision required. The most powerful strategy is one that provides high accuracy while requiring little processing time; however, the most expensive technique is one that requires a great deal of processing time.

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## Ground water quality with special reference to fluoride: A Review

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**Abstract:** Water has very curial for all living beings. Groun d water, surface water (rivers, streams and ponds), atmospheric water (rain -water, snow and hail) and springs are the main source of water available to the people in general. The qualities of water bodies vary widely depending on the location and environme ntal factors. For daily activities like drinking, washing, bathing, cooking and several other activities water is needed. Quality of underground water is major concern for drinking purpose. If the quality of water is not good then it becomes unfit for drin king and other activities. The quality of groundwater is generally described by chemical, physical and biological parameters. The groundwater analysis for physical and chemical properties is very important for Public health studies. Natural processes and human activities cause the changes in groundwater quality, directly or indirectly. The quality of water depends on industrialization, use of chemicals, fertilizers and pesticides for agriculture are causing deterioration of water quality and depletion of aq uatic life. Due to use of contaminated water, human population suffers from water borne diseases.

**Keywords:** Underground water, Physiochemical parameters, Fluoride

**Introduction :-**Water is the most significant and fundamental common asset for life on earth. It is unreservedly accessible and most liberally accessible in nature. Although ground water commitment is just 0.6% of the all-out water assets on earth and it is likewise the significant wellspring of drinking water for country and urban populace also. In India, around 20 states have been related to issues of high fluoride focus in ground water assets. Country populaces who are chiefly rely upon underground water for drinking purposes and gravely influenced by fluoride pollution. [1-3] In most recent couple of years, urbanization, industrialization and much use of water assets have taken care of the debasement of water quality and decrease in per capita accessibility in a few nations being worked on and creating nations also. Because of different en vironmental factors either common or synthetic, the ground water is getting dirtied on account of removal of perilous squanders, fluid and strong squanders from businesses, sewage removal, surface impoundments and so on. During its unpredictable stream history, groundwater goes through different topographical arrangements prompting ensuing sullyng in shallow springs. Nearness of different contaminants like fluoride, arsenic, nitrate, sulfate, pesticides, other overwhelming metals and so forth in underground water has been accounted for from various pieces of India. [4] Ground water have always been the most important fresh water resources for drinking as well as industrialization purposes still most of the developmental activities are dependent up on them. Ground water finds multiple uses in every sector of development like agriculture, industry, transportation, aquaculture, public water supply etc. Ground water is a very important resource for irrigation and drinking purposes. It supports natural e nvironments, including diverse flora and fauna. It also has an important role in recreational activities and in contributing to overall quality of life. Ground waters naturally contain a wide variety of substances, and human activities inevitably add to this mixture. Scientists have therefore developed specialized approaches to measuring quality. [5-6]

### Review of literature

**Savita et al (2020)** carried out the hydrogeochemical investigations in the eight villages of Tosham Block; district Bhiwani, Haryana t o recognize the mechanism and sources of enrichment of fluoride in the groundwater. On the basic of results obtained, they specified

that concentrations of fluoride attain up to 1.9 mg/l in groundwater samples. In the soils, the overall fluorine contents vary between 1.1 and 2.7 mg/kg, which could have sufficient potential to release fluorine into the groundwater. In groundwater, the fluoride enrichment is primarily controlled by solubility of fluorite, intensity of evapotranspiration, residence time and the processes of weathering prevailing in Tosham area. Moreover, various other water quality parameters such as pH, electrical conductivity, total hardness, and total alkalinity as well as calcium, magnesium, carbonate, bicarbonate and chloride concentrations have also been calculated. They also carried out a logical calculation of correlation coefficients between different physicochemical parameters. They reported that 67% of groundwater samples do not comply with WHO standards of fluoride for drinking purposes. They also observed that the excessive fluoride concentration in the groundwater of villages under study causes dental fluorosis among people especially the children. Except few of villages, without any prior treatment, the overall quality of water was found unacceptable for drinking purposes.

**Upadhyay et al (2019)** carried out this study aims to determine, assess and compare the ground water quality at various region of NH -11. They have taken samples from different location (Bassi, Dyarampura, Kanota, and Jamdoli) in present study to investigate various physio-chemical characteristics of ground water. They compared the water quality among each areas by certain physical and chemical parameters such as (hardness, pH, alkalinity, chloride content, TDS, residual chlorine, turbidity, etc.). The results obtained are thus compared with the standards for providing better quality of drinking water.

**Mahapatra (2019)** in his book "Fluoride Menace in Orissa" has dealt vividly as to different processes of fluoride entry into the living system and its impact including the mechanism of its action. He has presented a detailed study of the extent of fluoride contamination in Orissa and its social implications. He has identified the challenges ahead of the society and the government and has suggested some measures to ameliorate the menace.

**Rathore et al. (2019)** studied and reported that on the earth water is a basic and chief part for every single living being. Water is overflowing and most unordinary characteristic constituent, on the earth. In the towns of Dhar locale, an inborn belt territory, normal assets of water is hand siphons, wells, lakes and streams. Among them nature of water of hand siphon is debasing ceaselessly and in this manner it is basic to screen water quality time to time and treatment, if necessary before utilization of drinking reason. The present composition manages fluoride focus at Nalchha square of Dhar area of Madhya Pradesh. Different drinking water wellsprings of towns of Nalchha square were indicated and chose for inspecting and their fluoride focus were dissected. These water sources having high fluoride fixation are set apart as red. It is prompted that water from these water sources must not to be utilized for drinking reason before treatment.

**Faldu et al. (2018)** studied and reported that the experimental results conclude that the ground water of Pali district is not suitable for drinking. Water parameters are changing regularly in various years but still they are far away from permissible limits. The population of Pali district is suffered from various diseases like Bitter taste, corrosion, affects mucous membrane, gastrointestinal irritations, undesirable taste, boiled rice turns yellowish, corrosion, dental and skeletal fluorosis, blue baby disease, scale forming, skin irritations etc. Chloride and Fluoride in Bassi town, Nitrate and TDS in Godawas town is expanding greatly and should be controlled.

**Rathore et al. (2018)** studied and reported that water is one of the major components of life for living being on earth. On the earth, it is abundant and most unusual natural component. Hand pumps, wells, ponds and rivers are the common resources for villages of Dhar district, a tribal belt area. Among them water quality of hand pump is degrading continuously with faster rate and therefore it is essential to monitor water quality time to time and treatment, if

needed before use of drinking purpose. The present manuscript deals with fluoride concentration at Umarban and Tirla blocks of Dhar district of Madhya Pradesh. Various drinking water sources of Umarban and Tirla blocks of Dhar district were specified and selected for sampling and their fluoride concentration were analyzed. The fluoride concentration in KhandanBujurg (S -3), Ghanora (S -26) and Kuwa (S -21) water sources, is much higher than Badlipura (S -8), Dhanora (S -27) and Banzari (S -29) etc. These water sources having high fluoride concentration are marked as red. It is advised that water from these water sources must not to be used for drinking purpose before treatment.

**Samba Shiva Rao *et al.* (2018)** studied and reported that the suitability of water quality for drinking purpose in the Narsamapet Mandal area by measuring physicochemical parameters, including major cation and anion compositions, pH, total dissolved solid, electrical conductivity, and total hardness. They found that the nitrate concentration ranged between 20 to 145 mg/liter and chloride concentration range of 48 -241 mg/liter, where the fluoride concentration ranges from 0.52 to 0.60 mg/liter. The Values obtained for different parameters, are compared with the standard values given by WHO/TSE and suitable suggestions were made in the Narsamapet Mandal area.

**Maurya (2017)** reported that water quality of samples collected from the villages of Sikar district area by performing numerous analyses including bodily, chemical and microbiological assessment samples gathered. The samples have been located to have excessive pH, indicating alkalinity of the water samples, and high chromium content fabric. Microbiological high-quality changed into also questionable in most of the cases. They also observed that the opposite of those findings, majority of human beings dwelling in those areas have been not laid low with various water borne ailments. They suggested that the look at argues about the need and significance of water purification and water control systems in cutting-edge-day instances.

**Thamilarasan *et al* (2017)** studied various physicochemical parameters like Electrical Conductivity, pH, Sulphate, Chloride, Percent of Sodium and TDS etc. in Manapparai Taluk, Trichy district, Tamil Nadu, India. They reported the higher and lower values of all the tested parameters in samples taken for study. They found that maximum concentration is 2400 in Chithampatti area whereas minimum concentration 117 in Sengampatti. pH concentration in the Manapparai Taluk could be seen the maximum concentration is 8.8 (Vetapuricherpatti) whereas minimum concentration is 6.7 in Utupatti. Maximum concentration (8.522) of Bicarbonate is seen in the Sadaiyampatti area whereas minimum concentration (0.72) is seen in Alampattipudur. The Groundwater geochemistry in the Manapparai Taluk showed that the pH values ranges from 6.7 to 8.8 and concentrations of EC, TDS and other major cations and anions of groundwater in the Manapparai Taluk depicts and they concluded that the samples tested are well suited for domestic and irrigational purposes.

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## Virtual Learning Management System (VLMS)- A Moodle Approach to Learning Together Even we are Apart

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**Abstract:-**A Virtual learning is an emerging trend as a promising instructional medium as well as latest trend in which to conduct research on its impact of teaching and learning activities in cloud based. The fundamental nature of virtual learning as an instruction medium differs substantially from face to face delivery, thereby required more new ideas and features for course design, layout and organizing e-content, resource management, online assessment & e-quiz and learning management system. The Moodle – open source is a software package for producing cloud / internet-based courses on websites. It is Learning Management System (LMS) that allows better cooperation among learners, tutor and students. In this paper we explore the implementation of effective way of virtual learning through Moodle and also present how the various facilities of Moodle are useful for provide the interactive and stimulating virtual learning experience in school education for various classes.

**Keywords:-**Virtual learning, Moodle, Activities, Learning Management System (LMS), online-Quiz and assessment.

**Introduction:-**This is the world of distance learning. Virtual learning management is a process of education in electronic form through cloud based, extranet, internet or the intranet network with the use of learning management system for education. Imagine this, a working professional also happens to be a part-time student. They study at their home desk or favorite coffee shop, attend classes in a virtual classroom and have meetings with their mentor using the best virtual meeting tools. At the end of their course, they get a certification of academic accomplishment without having traveled to their university overseas or, indeed, having met any of their classmates and mentors offline.

Virtual learning allows students to pursue academics while working a job or carrying out their personal schedules. It facilitates learning from anywhere anytime without additional costs of accommodation and travel. This is done through the use of virtual learning platforms, meeting and conferencing platforms and virtual conference software that impersonate face-to-face interactions, although digitally. In today's world many researchers have done surveys online students said that they found distance learning the same as or even better than traditional classroom-based courses and some tutors agreed that it is a best way to accommodate the number of students online compare to physical face to face. Also some of tutors agreed that delivery of content is more in compare to face to face. In terms of management agreed easy to manage the distance learning it's reduce the transport, building maintenance, utilities and reduce the number of staff. During the COVID-19 pandemic time all people learned to manage all the work virtually.

Virtual learning/eLearning synchronous classes run in real time, with students and tutors attending together from different location. Asynchronous classes run on a more relaxed schedule, with student's access to recorded classes and materials during the different hours and from different location anytime anywhere. Online classes basically divided into two categories — synchronous and asynchronous — each of which aligns with different students' interests, personalities, and learning styles. This page explores these two types of online delivery.

The process of eLearning can be represented in the following eLearning anytime anywhere.

- **Skill Analysis:** The learning manager analyses the learner's present skills and skills that are set as a learning goal, and obtains the necessary material information. The manager then searches for the related material.
- **Material Development:** The developer creates the material outline structure and exercise questions and e-quiz. The material structure is linked with explanatory pages.
- **Learning:** The learner engages in learning that is suited to the need, that is, individual learning for knowledge acquisition, or collaborative learning for workshop-type learning.
- **Evaluation:** The learner carries out exercises and takes examinations using questions designed according to the learning goal. The learning manager makes the evaluation of each learner, using results of exercises and examinations.

There are two types of free platforms for online learning. First, there are those hosted on a public site and the user just signs up and uses the platform, but the platform "lives" on a server somewhere in cyberspace cloud infrastructure. The second type of platform is that must be downloaded, saved and hosted on the user's own server. The free online class platforms that must be hosted on your own server are "open source applications". This means that the software is available free for limited user under the terms of the GNU General Public License (GPL). This basically means that the user can copy it, distribute it, even charge for it, but cannot get patents on it. Also, the source code must always remain open and available for viewing by anyone looking at the site so that it does not become proprietary.

### **What is Moodle?**

Moodle is a content management system / learning management system (CMS/ LMS) for offline, online learning and mobile learning. The acronym MOODLE stands for **Modular Object-Oriented Dynamic Learning Environment**. Among its many features and number of user's statistics (<https://stats.moodle.org>), however, Moodle has already become a term of its own synonymous with a software package designed to help educators create quality online instruction. It was the brainchild of Martin Dougiamas a former WebCT administrator with postgraduate degrees in Computer Science and Education. The design of Moodle is based on socio-constructivist pedagogy. This means its goal is to provide a set of tools that support an inquiry- and discovery-based approach to online teaching learning. Furthermore, it purports to create an environment that allows for collaborative interaction among tutor, students as a standalone or in addition to conventional classroom instruction.

One of the advantages of Moodle is that it has been developed as an Open Source software project. It is entirely supported by a team of programmers and by the user community. This also means that Moodle is available free of charge under the terms of the General Public License (GNU) and has no licensing cost attached.

### **Deployment and Technical Background**

*Moodle* runs without modification on UNIX, Linux, Windows, Mac OS X, NetWare, and any other system that supports PHP (HTML -embedded scripting language), including most Web host providers also Moodle itself dedicated has hosting space to help you on paid. If we are an organization or intuitions that has in house technical expertise, can download and install, hosts modify and customize your own domain and website to support community throughout journey. Open source and free. Data is stored in a single database: MySQL and PostgreSQL are best supported, but it can also be used with Oracle, IBM DB2, Microsoft SQL Server, SAP DB, SQLite, Sybase, Microsoft Access, ADO, and generic ODBC database access, since it uses ADOdb(<http://www.adodb.sourceforge.net>).

### **Moodle Architecture and eLearning Functional Model:**

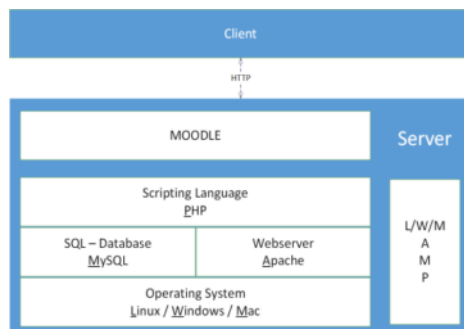


Fig1: Moodle Architecture

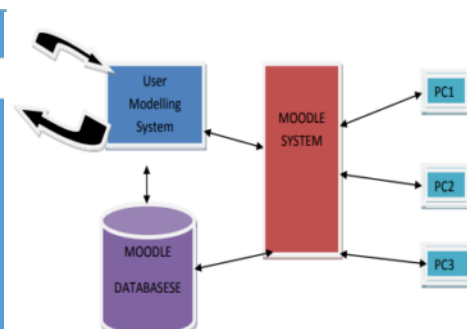


Fig2: eLearning functional model

Moodle was our choice to integrate our method of extraction of learners' emotions. It was not an easy task even though Moodle is an open source platform; there are many kinds of coding protections. Figure 1 presents the technical architecture of Moodle proposed by Romero et al.[11]. For the configuration, this platform requires an Apache web server, PHP language and a MySQL database.

This architecture explains the fundamental thought of scattered eLearning system means the communication of messages through the communication of web service agents, present in each system. Service Provider is the podium that hosts right to use to the service. It is the server in a clientservice environment. Service Requester is the function that is looking for and calling upon or initiating the communication with a service. A Web Services Description Language (WSDL) file holding the explanation of the message and information regarding end point is published by the provider to permit requester to create the Subjective, Objective, Assessment and Plan (SOAP) message and transmit it to the exact destination. The practical model of an eLearning structure creates an interface between the mechanisms and the objects of the eLearning system.

### SOAP (Subjective, Objective, Assessment and Plan)

**Subjective:** Documentation under this heading comes from the "subjective" experiences, personal views or feelings of a patient or someone close to them. In the inpatient setting, interim information is included here.

**Objective:** This section documents the objective data from the patient encounter. This includes:

- Vital signs
- Physical exam findings
- Laboratory data
- Imaging results
- Other diagnostic data
- Recognition and review of the documentation of other clinicians.

**Assessment:** This section documents the synthesis of "subjective" and "objective" evidence to arrive at a diagnosis. This is the assessment of the patient's status through analysis of the problem, possible interaction of the problems, and changes in the status of the problems

**Plan:** This section details the need for additional testing and consultation with other clinicians to address the patient's illnesses.

A multi-user atmosphere in which the knowledge developer can create, reuse, manage, store, and distribute digital learning content from a central storehouse is known as LMS. Here the processes adjoining the learning are managed by LMS. LMS permits the users to generate and to use again small units of digital instructional learning material. The incorporated use of metadata arrangements and learning object import and export formats also allows learning objects to be created and shared by multiple tools and repositories. LMS integrates specifications of metadata, content wrapping, and content communication. The components of LMS are shown in "Fig 2".

LMS needs the interchange of customer profile and customer registration information with other systems. The position of the course choice and the learner action are offered by the LMS. The mechanisms and information needed are shown in “fig 2”.

### Cloud Based eLearning website Homepage:

Admin login homepage show in fig:3, its show the different categories of courses from kindergarten to class-XII in admin login credentials.

Dashboard of student login shown in fig:4, it shows all the student running courses and its percentage of completion on every chapter.

We can see many activities in fig:5 like e-content, e-recourses, assignment and e-Quiz and many more.

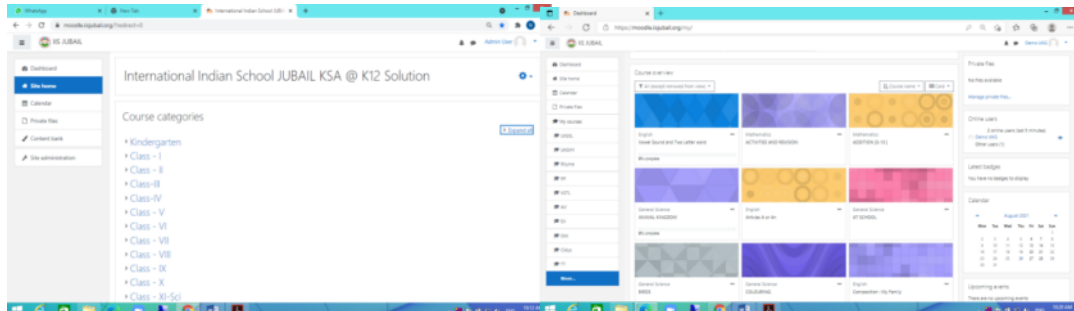


Fig3: Homepage Screen shot of Admin user Fig4: Dashboard of Student Login

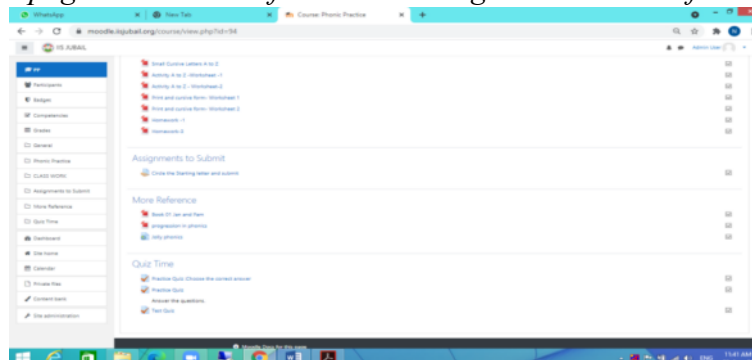


Fig5: Resources and Activities

### Types of user and Authentication

- After the completion of the Moodle installation, we can set an administrator account and password along with database username and password.
- Using this account we can create as many numbers of user and their roles also possible to create multiple categories and courses, add users to the individual or group of courses, and manage other course design and functions.
- Administrator
- Manager
- Course creator
- Teacher
- Non-editing teacher
- Student
- Guest

### Virtual Learning Management System (VLMS)

A complete eLearning solution for the school, which some of important features of Moodle platform:

- Common platform for Management, teachers, student and parent
- Support multiple institutes and multiple languages
- e-Courses and e-Assignment

- Secure and centralized data
- Mobile Application on Android & iOS
- Upload e-textbooks
- Provide the video link and play with Moodle environment
- e-Quiz and e-question bank with question tags
- e-Test / e-Exam secured
- Automatic and manual grading system.

### **Limitation**

- Every software has some advantages and is respected by a few institutions, there are a few pros and cons. This is, of course, because nothing can be perfect.
- The first big issue is the fact that Moodle is not fully developed to cope with big projects. While it may be useful for colleges or universities of small to medium size, the system might not work efficiently with larger schools or serve as a great way.
- The more concurrent users that access the platform, the slower the system becomes.
- This can be troublesome for students when they are trying to take quizzes or tests, or just simply trying to access the course content. The website can also shut down on occasion, blocking the opportunity for students to access course materials.
- Moodle users frequently complain about the troubles they experience with customization. In order to perform efficient customization, you are going to need to know how to program and have some type of knowledge when it comes to coding.

### **Summary**

- Moodle has its inherent flexibility and easy -to-use interface, Moodle can be used to reach a wide range of needs. In fact, many tutors and students that are introduced to Moodle in primary, secondary, and further education find themselves using Moodle again later in life when they enter the workforce, Moodle has the added benefit of providing easy adaption for both tutor and learners who may have experienced the platform elsewhere previously.
- Virtual learning playing field of education, allowing students from all over the world to access interesting classrooms regardless of where they live or work. Virtual learning can supplement existing education structures or be used as the main structure for imparting knowledge.
- Virtual education promote inclusive and democratic learning, and also help reduce the costs of highly coveted educational courses and certifications. Virtual classrooms and online virtual meeting platforms ensure education continues albeit online and at home.

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## Pharmacological screening of polyherbal formulation for diabetic associated Hyperlipidemia

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**Abstract:**-Herbal medicines also termed as botanical medicine or phytomedicine refers to using a plant's seeds, berries, roots, leaves, bark, or flowers for medicinal purposes.

Herbalism has a long tradition of use outside of conventional medicine. *Grewia*

*subinaequalis* DC. In the family Tiliaceae, only one genus, *Grewia*, yields edible fruit.

*Saccharum officinarum* is a large, strong -growing species of grass in the genus

*Saccharum*. *Neisosperma oppositifolium* is a tree usually growing from 6 - 25 metres tall, though it can range from as small as 2.5 metres up to 45 metres, exceptionally to 60 metres.

Moisture is an inevitable component of crude drugs, which must be eliminated as far as practicable. Drying plays a very important role in the quality as well as purity of the material.

**Key Words:** Hyperlipidemia, Phytomedicine, HPTLC, Polyherbal tablet, Antidiabetic.

**Introduction:**-Herbal medicines also termed as botanical medicine or phytomedicine refers to using a plant's seeds, berries, roots, leaves, bark, or flowers for medicinal purposes.

Herbalism has a long tradition of use outside of conventional medicine (Web 1). Herbal

medicine, also known as alternative medicine, is used to prevent and treat various

ailments. Compared with modern synthetic or chemical drugs, herbs have many advantages.

Today, across the world people are becoming more and more aware of the importance to turning back to nature to combat different health problems. Herbal remedies are found in nature and completely devoid of any side effects.

### ***Grewia subinaequalis* DC.**

In the family Tiliaceae, only one genus, *Grewia*, yields edible fruit. The only species of any importance is *G. subinaequalis* DC., long referred to in literature as *G. asiatica* L. Phalsa is the most used vernacular name in India where there are a number of dialectal names. The plant is called Phalsa in Pakistan (Morton, 1987).

### ***Saccharum officinarum***

*Saccharum officinarum* Family of Poaceae is a large, strong -growing species of grass in the genus *Saccharum*. Its stout stalks are rich in sucrose, a simple sugar which accumulates in the stalk internodes.

### ***Neisosperma oppositifolium* (Lam.)**

*Ochrosia oppositifolia* Family of Apocynaceae is a tree usually growing from 6 - 25 metres tall, though it can range from as small as 2.5 metres up to 45 metres, exceptionally to 60 metres.

## **HPTLC FINGERPRINTING ANALYSIS**

HPTLC is a technique used for separation and identification of components. The separation is based on the difference in adsorption coefficients of the individual components of a mixture and identification is based on the comparison of R<sub>f</sub> values. Components that are strongly adsorbed on the stationary phase move up less readily than those that are adsorbed to a lesser

extent, leading to the separation of the compound. Chromatographic studies were carried out following (Harborne, 1998; Stahl *et al.*, 2005; Wagner *et al.*, 1996).

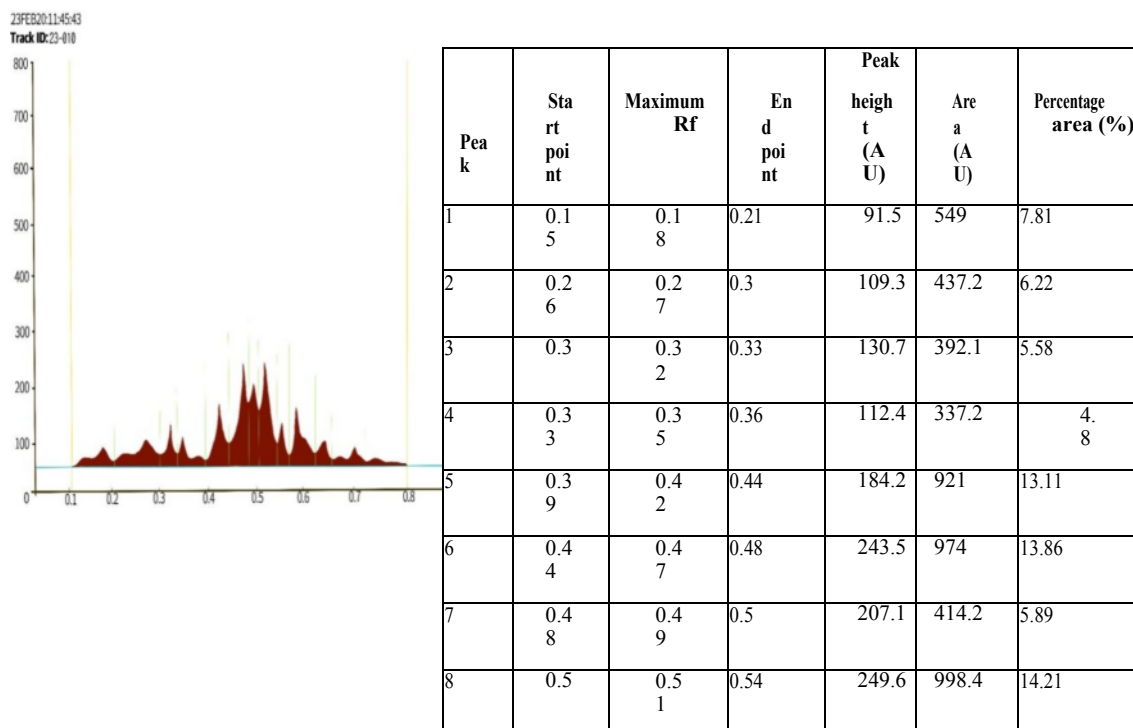


Fig: 1.1. HPTLC chromatogram of Aqueous extract of *Grewiasubinaequalis* DC. Heartwood

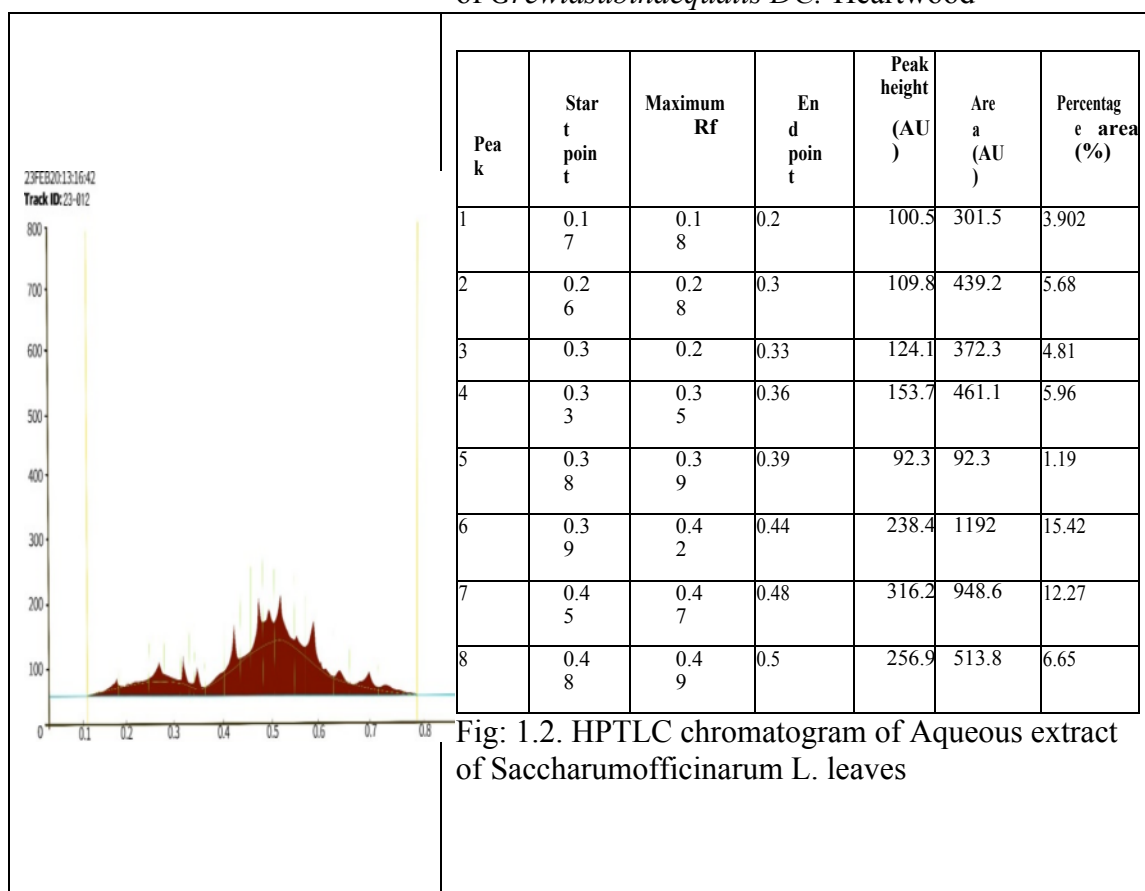
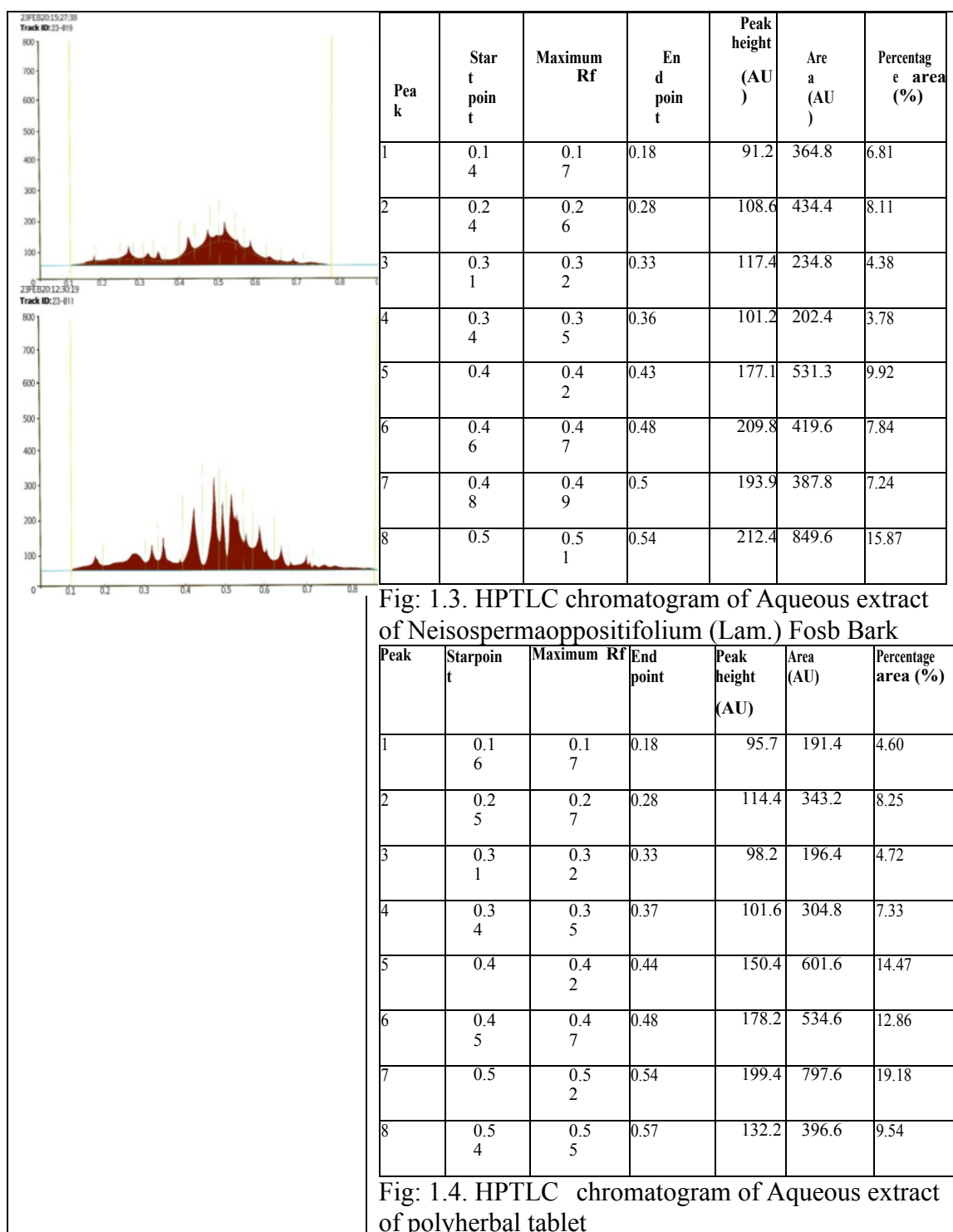


Fig: 1.2. HPTLC chromatogram of Aqueous extract of *Saccharumofficinarum* L. leaves



## Results and Discussion

### Acute oral toxicity studies of aqueous extracts

The body weight of the rats before and after administration were noted that there is no changes in skin and fur, eyes, mucous membranes, respiratory, circulatory, autonomic and central nervous system and motor activity and behaviour pattern were observed and also no sign of tremors, convulsions, salivation, diarrhoea, lethargy, sleep and coma were noted. The onset of toxicity and signs of toxicity also not observed. In further study there was no toxicity/ death were observed at these levels.

**Table: 2.1. Acute Toxicity test studies of AEGS**

Sl. No	Groups	Dose/kg (body weight) p.o	Weight of Rats		Signs of Toxicity	Onset of Toxicity	Duration of Study
			Before Test (g)	After Test (g)			
1.	AEGS	2000 mg	176	178	No signs of Toxicity	Nil	14 days
2.	AEGS	2000 mg	172	173	No signs of Toxicity	Nil	14 days
3.	AEGS	2000 mg	221	220	No signs of Toxicity	Nil	14 days

AEGS- Water Extract of *Grewiasubinaequalis* DC. Heartwood

**Table: 2.2. Acute toxicity studies of AESO**

Sl. No	Groups	Dose/kg (body weight) p.o	Weight of Rats		Signs of Toxicity	Onset of Toxicity	Duration of Study
			Before Test (g)	After Test (g)			
1.	AESO	2000 mg	175	174	No signs of Toxicity	Nil	14 days
2.	AESO	2000 mg	150	148	No signs of Toxicity	Nil	14 days
3.	AESO	2000 mg	190	194	No signs of Toxicity	Nil	14 days

**Table: 2.3. Acute toxicity studies of AENO**

Sl. No	Groups	Dose/kg (body weight) p.o	Weight of Rats		Signs of Toxicity	Onset of Toxicity	Duration of Study
			Before Test (g)	After Test (g)			
1.	AENO	2000 mg	176	178	No signs of Toxicity	Nil	14 days
2.	AENO	2000 mg	179	175	No signs of Toxicity	Nil	14 days
3.	AENO	2000 mg	185	183	No signs of Toxicity	Nil	14 days

AENO- Aqueous Extract of *Neisospermaoppositifolium* (Lam.) Fosb Bark

**Conclusion:-**Both oral anti-diabetic medications have side effects as used now. Weight gain and hypoglycemia are two side effects of sulfonylureas. The extracts and the regular medication helped to get the elevated glucose levels back down to normal. As compared to the usual group of rats, the water extracts at a dosage of 250mg/kg revealed a glucose level of 193mg/dL, which is not that important. When rats were given AESO at a dosage of 250 mg/kg, their glucose levels dropped to 130 mg/dL, which is not statistically important when compared to normal rats. Water extracts AENO, on the other hand, demonstrated a substantial reduction in glucose levels to 120 mg/dL when given at a dosage of 250 mg/kg. In the other hand, the Herbal tablet at 250mg/kg resulted in a substantial reduction in glucose to normal levels. The same outcomes were observed in the groups given the regular synthetic medication. This group performed higher than any extract in terms of lowering blood glucose levels. The extracts, on the other hand, were professional enough to illustrate comparable

behavior. In contrast to the diabetic control group, the overall lipid profile in serum (TG, TC, HDL, LDL, and VLDL) of STZ mediated diabetes animals treated with Polyherbal tablets was significantly increased. These findings indicate that PHT can inhibit the cholesterol synthesis pathway, and that the increased HDL/LDL ratio is due to the activation of LDL receptors in hepatocytes, which are responsible for absorbing LDL into the liver and lowering serum LDL levels.

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## CALCULUS IN ECONOMICS - MATHEMATICAL MODEL

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**Abstract:**-Economics is a social science as it deals with the human society and social behaviors of human beings which deals with the mathematical parameters and the need of individuals in society. It is scientific study of ownership, exchange of resource even it does not deal with controlled experiments like in pure science but it can employ many methods of observations, analyzing and construction of models using economics variable price, demand, cost, supply, production, income and expenditure like all scientist. Economist develop hypothesis, construct model and analyze them with mathematical technique. This paper examines the important of mathematics in Economic analysis.

**Keywords:**-Function, differentiation, integration, differential equation, economics, mathematical models

**Introduction:**-From ancient period mathematics has been used to represent real life activities in human life. Basic operations like addition, subtraction, multiplication and division were the part of the day-to-day life with regards to resources and simplifying the need of individuals. Actual use of mathematics in Economics analysis dated back-to-back. In 17th century when economic analysis was known as classical economics with the applications through arithmetic and algebraic means. In 1826 economist did not develop any explicit abstract when John Henrich von Thurn used empirical data with his classical approach in order to support to generalization of farmland model. Then onwards many Economists used mathematical model to represent and analyze of problems in Economics as a branch Mathematical economics. Still if we see back past two centuries, we find a gap between two disciplines. The number of Economists having command on higher mathematics is too less and hardly any top mathematician who has taken interest in theoretical economics in comparison to physical science. An economy is primarily divided into two categories - microeconomics and macroeconomics. **Microeconomics** is the study of the economy on an individual or company level. Contrary to it, macroeconomics observes a nation's economy as a whole, including its performance, structure, and policy making for future direction.

**Microeconomics** focuses on the choices made by individual consumers as well as businesses concerning the fluctuating cost of goods and services in an economy. It deals with individual income, output prices, demand and supply of goods. Microeconomics covers several aspects, such as –

- Supply and demand for goods in different marketplaces services and labor
- behavior and choice of consumer as an individual or as a company.
- Demands of individual labor markets, and determinants like the wage of an employee.
- Equilibrium of consumer and producer

One of the main features of microeconomics is that it discusses casual situations which a marketplace experiences certain changes in the existing conditions.

Macroeconomics studies the economic progress and steps taken by a nation. It also includes the study of policies and other influencing factors that affect the economy as a whole.

**Macroeconomics** follows a top-down approach, and involves strategies like –

- The overall economic growth of a country.
- Reasons that are likely to influence unemployment and inflation of the Economy
- Fiscal policies that are likely to influence factors like interest rates, taxation
- Effect of globalization and international trade.
- Reasons that affect varying economic growths among countries.



Another feature of **macroeconomics** is that it focuses on aggregated growth of national or regional economy and studies behavior of population.

**Micro** and **macroeconomics** are interdependent to some extent. Several differences also exist between these two segments of economics. The study of mathematical economics and classical economics as a macroeconomics or microeconomics becomes precise and logical because of mathematical parameters in complex economic situation as production, income, labor employment and economics as a behavior of individual with parameters Demand, supply, price etc. Mathematics permits to construct well defined models using different fields of mathematics as calculus, difference and differential equations algebra, linear Algebra, mathematical programming, statistical techniques which can be tested and used to make quantifiable predictions about future planning. Mathematics with Statistical methods and economic theory enabled quantitative analysis possible as Econometrics. Econometrics is the use of statistical methods using quantitative data to develop mathematical models based on regression analysis or test existing hypothesis. As macroeconomics deals with population's quantitative data, Statistical techniques is more comfortable with it.

Mathematical modelling is the process of expressing Real world phenomena in mathematical form of equations which can represent the characteristic of textual problem.

The process of constructing mathematical model can be considered as in traditional approach

1. Identify all the key elements
2. Write down the simplified equation
3. Solve the equation
4. Compare and analyze the result

If the results agreed ok or modify and repeat the process.

While studying economic models we should understand that it is Simply a Framework for representing Complex economic situations throughout of variables and quantitative relationship. The focus of model is to understand situations, observed pattern and predict the result.

Two mathematical discipline such as Algebra and calculus are widely used in studying economic model of microeconomics. Implicit differentiation is more important than many other mathematical techniques applied in economics. The reason for that is, many functions are defined implicitly by a system of equation in economic models. The form of Economic functions can not precise due to uncertainty of human behavior. Many assumptions have to be considered to reach mathematical formulation which gives incompleteness in comparison to physical science. But with some definite properties and restrictions functions can be constructed and analyzed by diagrams (curves) and numerically. Demand function, supply function, price function, revenue functions etc can be studied with graph as graph are possible for any functions

We have learned in calculus that when 'y' is a function of 'x', the derivative of y w.r.to x

i.e.,  $\frac{dy}{dx}$

measures the instantaneous rate of change of y with respect to x. In Economics and commerce

we come across many such variables where one variable is a function of the other. For example, quantity demanded is the function of price, as per such relationship demand D should be function of price i.e.  $D = f(p)$  but Marshall defined in other way as price is function of demand as  $p = f(D)$  and later on accepted by mathematicians also, same for supply as function of price  $S = f(p)$ . Calculus helps us in finding the rate at which one such quantity changes with respect to the other. Marginal analysis in Economics and Commerce is the most direct application of differential calculus. In this context, differential calculus also helps in

solving problems of finding maximum profit or minimum cost etc., while integral calculus is used to find the function when the marginal functions are given,

The derivative  $f'(x)$  of a function  $f(x)$  is a new function that relates each value of  $x$  to the derivative of  $f(x)$  in  $x$ .

**The derivative function is denoted  $f'(x)$  or  $y'$  or  $\frac{dy}{dx}$**

Consider the standard **macroeconomic** model for calculating national income in a closed economy assuming the following:

$$(a) Y = C + I$$

$$(b) C = f(Y)$$

Where (a) tells us that income is divided between consumption and investment and (b) defines consumption as a function of income, where,  $f'(Y)$  is marginal propensity to consume and it lies between 0 and 1.

1. Suppose that  $C = f(Y) = 96.08 + 0.612Y$ , use equation (a) and (b) to find 'Y' in terms of 'I'

2. Putting the expression for 'C' from (b) into (a) results in  $Y = f(Y) + I$ . In this equation 'Y' is defined as differentiable function of 'I'

Here  $Y = 96.08 + 0.612Y + I$ , solving for Y, it gives

$$Y = [96.08 + I] / [1 - 0.612] = 247.63 + 2.58I \text{ which means } \frac{dy}{dI} = 2.58 \text{ so if I increases}$$

by 1 billion then national income increases by 2.58 billion dollars.

Differentiating  $Y = f(Y) + I$  with respect to I, it gives

$$\frac{dy}{dI} = f'(Y) \frac{dy}{dI} + 1 \text{ which means}$$

$$\frac{dy}{dI} = 1 / [1 - f'(Y)]$$

$$\text{If } f'(Y) = 0.75 \text{ then } \frac{dy}{dI} = 4 \text{ and for } f'(Y) = 0.612 \text{ then } \frac{dy}{dI} = 2.58.$$

Since  $f'(Y)$  lies between 0 and 1  $-f'(Y)$  also lies between 0 and 1 therefore  $1/[1 - f'(Y)]$  is always greater than 1. Therefore, in this case, \$1 billion increase in investment result in more than \$1 billion increase in national income.

Derivative is the central concept in mathematical analysis which is used to describe the rate of change of a function. Differential calculus has been the foundation for the development of modern science. It has also been of central importance to the theoretical development of modern economics (Knut Sydsaeter, Peter Hammond and Arne storm 2012).

For example, for an estimated cost function  $C = 65x + 52$  for I-land steel Corporation Limited (C is the cost in dollars per year and x is the production of Steel in quintals per year).

The slope,  $\frac{dc}{dx} = 65$  means if production increases by 1 quintal, then cost increases by

\$65. Similarly, for another estimated annual demand function  $q = -0.24p + 0.15$  for wheat (p is the price in rupees and q is the quantity per person).

The slope,  $\frac{dq}{dp} = -0.24$  means that if price increases by one rupee, then quantity demanded decreases by 0.24 units.

Various economic studies show that the quantity demanded of a commodity depends upon many factors, viz., price of the commodity, consumer's income, taste of the consumer, price of other related commodities etc. To simplify things, we will consider the relationship between demand and price of the commodity only, assuming that all other factors remain constant.

The price per unit and the quantity demanded at that price are usually related inversely — higher the price, lesser is the quantity demanded — or, higher the quantity demanded, lower is the price.

Demand function  $x = f(p)$  However, by tradition, price  $p$  is shown against demand  $x$ .

Thus,  $p = f(x)$

Economists use the following functions in their study of business.

$C(x)$  = cost of producing  $x$  items

$R(x)$  = revenue from the sale of  $x$  items

$P(x)$  = profit from the production and sale of  $x$  items

The equation relating these functions is  $P(x) = R(x) - C(x)$ . In words, profit is revenue minus cost.

An economist uses the word marginal to refer to the rate of change. That is, the word marginal means derivative. Thus,

$C'(x)$  = marginal cost

$R'(x)$  = marginal revenue

$P'(x)$  = marginal profit

A company sells pans for \$3 each, and the costs associated with these pans are given by  $C(x) = 1.25x + 0.01x^2 + 50$ . The marginal cost function is  $C'(x) = 1.25 + 0.02x$ .

The revenue function is  $R(x) = 3x$ . hence marginal revenue is  $R'(x) = 3$ .

Marginal profit is

$$P'(x) = R'(x) - C'(x) = 3 - (1.25 + 0.02x) = 1.75 - 0.02x$$

The value of the marginal cost at  $x = x_0$  is an approximation to the additional cost incurred in producing one unit beyond the  $x_0$  level of production. This is true because  $C'(x_0)$  is really the slope of the tangent line to the cost curve  $C(x)$  at the point  $x_0$ .

Thus, the derivative can approximate the change in the height of the function.

If  $f(x)$  is differentiated to obtain  $f'(x)$ , it may be possible to compute a derivative of  $f'(x)$ .

If  $f'(x)$  is differentiated, the resulting function is called a **second derivative** and can be written

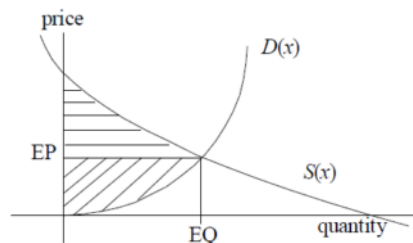
$f''(x)$  which is used in the concept of optimization.

we can take succeeding derivatives as long as the resulting functions are differentiable. In general, we represent the  **$n^{\text{th}}$  derivative** of  $f(x)$  in one of the following ways.

$$n^{\text{th}} \text{ derivative} = f^n(x) = y^n = \frac{d^n y}{dx^n}$$

In general, the price of an item determines the **supply** and the **demand** for the item. As price increases demand for the item usually falls. Conversely, as the price increases, the quantity producers are willing to supply will increase. We can view these relationships in a different light by letting the production variable,  $x$ , be the independent variable. Let  $P_c = D(x)$  be the price at which consumers are willing to pay if there is a quantity of  $x$  items produced. Let  $P_s = S(x)$  be the price at which producers are willing to supply items with a production of  $x$  items.  $D(x)$  should be a decreasing function and  $S(x)$  should be an increasing function.

**Equilibrium quantity** (EQ), and the corresponding price is called the **equilibrium price** (EP). The actual point of intersection is called the equilibrium point. We assume that the market establishes itself in such a manner that the equilibrium point is achieved. There are consumers willing to pay more than the equilibrium price for the product. When the product sells at the equilibrium price, these consumers realize a savings. The difference between what these consumers would be willing to pay and what they have to pay is called the **consumers' surplus**.



Geometrically, this represents the area shaded with horizontal lines above. This area is calculated with an integral as

$$\text{Consumers' surplus} = \int_0^{EQ} [D(x) - EP] dx$$

Similarly, we can talk about the producers' concerns. At an established equilibrium price, there are producers who would be willing to supply the item at a lower price. The difference between what the producers earn and what they would have been willing to accept is called the **producers' surplus**.

Geometrically, this represents the area shaded with slanted lines in the previous graph. This area is calculated with an integral as

$$\text{Producers' surplus} = \int_0^{EQ} [EP - S(x)] dx$$

Suppose the supply curve is given by  $D(x) = 2 - \frac{x}{2}$  and let  $S(x) = \frac{x^2}{4}$

Setting the two functions equal to find the equilibrium points gives us

$$2 - \frac{x}{2} = \frac{x^2}{4} \Rightarrow x^2 + 2x - 8 \Rightarrow (x+4)(x-2) = 0$$

We select the positive solution  $x = 2$  and this forces  $y = 1$ . The consumers' surplus is given by the following calculation.

$$\text{Consumers' surplus} = \int_0^2 \left[ \left( 2 - \frac{x}{2} \right) - 1 \right] dx = \int_0^2 \left[ \left( 1 - \frac{x}{2} \right) \right] dx = 1$$

The producers' surplus is calculated below.

$$\text{Producers' surplus} = \int_0^2 \left[ \left( \frac{x^2}{4} \right) \right] dx = \frac{4}{3}$$

Another useful application of calculus can be seen in the national income model. Let us consider a simple two-equation national income model for an economy that does not have government and trade relationship with other countries. For such an economy, the national income consists of the following two equations

$$Y = C + Y_0 \dots \dots \dots (1)$$

$$C = a + bY \dots \dots \dots (2)$$

Where, Y is national income, C is consumption, I<sub>0</sub> is autonomous investment, a and b are constants. We should note that in national income model, total production and total income generated in the process of production is considered to be equivalent. Thus, Y can be taken as either the total value of production or total income (national income). In this model, the total expenditure that can be incurred on the goods and services produced is the summation of the consumption expenditure and the investment expenditure, that is, C + I<sub>0</sub>. Equation (1) gives the condition for the equilibrium level of income. It states that national income will be in equilibrium, when, the planned production (Y) is equal to the planned expenditure (C + I<sub>0</sub>). In

otherwords, for equilibrium, the plan of the producers (suppliers) should match that of the buyers (demanders). Equation (2) presents consumption as a linear function of income with some restrictions on the constants (parameters)  $a$  and  $b$ .

The restrictions are  $a > 0$  and  $0 < b < 1$ . It is clear from equations (1) and (2) that  $Y$  and  $C$  are to be determined from the model whereas  $I_0$ , the autonomous investment, is given from outside the model. The variables which are determined from within a given model are called endogenous variables. Thus,  $Y$  and  $C$  are endogenous variables. The variables whose values are given from outside, are called exogenous variables. Here in this model, investment ( $I_0$ ) is an exogenous variable. Thus, investment virtually acts as a constant here. Let us try to solve this model for the two endogenous variables  $Y$  and  $C$ .

Rearranging (1) and (2), we get

$$Y - C = I_0 \dots\dots\dots (3)$$

$$-bY + C = a \dots\dots\dots (4)$$

We should note that in the rearranged equations, the endogenous variables figure on the left-hand side of the sign of equality. Writing equations (3) and (4) together in the matrix form

$$\begin{bmatrix} 1 & -1 \\ -b & 1 \end{bmatrix} \begin{bmatrix} Y \\ C \end{bmatrix} = \begin{bmatrix} I_0 \\ a \end{bmatrix}$$

which can be solved by matrix inversion method.

Differential equation in general expresses rate of change of one function with respect to other function as a relation to function itself which is called growth model in economics for example if  $y(t)$  represents GDP of a country at time  $t$  at some constant rate  $k$  then we have

$$\frac{dy}{dt} = k y(t), \text{ having solution } y(t) = c e^{kt}$$

Some famous models in economic growth theory may be seen as mathematical thinking of Economists twentieth century.

**Harrod – Domar growth model** - it was discovered independently by Roy Harrod in 1939 and Evsey Domar in 1946 to analyze business cycle but later it was used to explain economic growth rate through savings and productivity.

If  $y = f(k)$ ,  $k$  is a function of stock  $k$ , with marginal productivity,  $\frac{dy}{dt} = \text{constant } c$ , then

$$\text{output growth rate } \frac{1}{y} \frac{dy}{dt} = sc - \delta, \text{ having solution } y(t) = y_0 e^{(sc-\delta)t},$$

which shows the positive economic growth with the increasing investment through savings and productivity but with the assumption that labour and population size should not be taken in to consideration

**Conclusion:-** Relationship between economic parameters of GDP and consumption. conjointly in comparative static analysis the study compares totally different equilibrium outcomes exploitation equations and mathematical operational tools within which equilibrium value falls and equilibrium amount increases as an impact of increase in provide. Another mathematical thought known as compound result or exponential which is extremely vital mathematical process utilized in economic analysis of population growth. This tool helps us to forecast economic parameters in an exceedingly higher approach as a result of it takes more youngsters in future and also the population won't grow at same or constant rate. For advancement, arithmetic has become the mode of communication within the helps to spot the properties of those relationships. Elementary political economy uses straightforward mathematical techniques to explain and focus models having properties of good competition, complete info and no different uncertainties which will exist within the universe business and economic atmosphere. Whereas looking on the far side introductory political economy, intermediate as well as advance small political economy and economics drop these text studious assumptions. Hence, the mathematical demands to economic models become wide high. Some business analyst or social control social scientist that applies mathematical tools and techniques to unravel business connected issues criticize mathematical modelling

ineconomics. Firstly, these mathematical models and techniques don't have any relevance the important world business issues or choices that have to be compelled to be created. Secondly albeit these models are ready to build rare relation with the important world decision making then conjointly there's not enough needed information offered on the relevant variables to use these mathematical techniques.

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## Research Scope in the field of Self – Compacting Concrete

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**ABSTRACT:-** The flow able concrete having ability to compact due to its own weight i.e., Self - compacting concrete is become popular now a days due to its wide range of applications. It became therefore necessary to carried out a research work in this sector to increa se the work ability of SCC along with the strength properties with minimizing its cost, hence to make SCC more feasible. Concrete construction has been transformed by the invention of self -consolidating concrete (SCC), which is capable of achieving complet e compaction without the need of mechanical vibration while maintaining a consistent quality. Construction time, cost, and noise are all reduced significantly when SCC is used. Research to understand and control SCC's fresh and hardened characteristics is becoming more critical as its use grows. The report outlines SCC's future rheology, construction, and sustainability research requirements. Specifically, the goal of this study is to learn more about the behavior of recycled coarse aggregate combined with natural fibers when used in the production of self-compaction concrete. In SCC recycled coarse aggregate and stone powder are substituted for natural coarse aggregate and sand, respectively. These properties included workability, compressive strength, spli t tensile strength, modulus of rupture, and flexural toughness. The concretes were intended to have a “compressive strength” of 60MP a in order to with stand earthquakes. Thixotropy processes must be understood in addition to yield stress and viscosity, wh ich are critical properties for flow ability and stability. Cement-based systems' rheology must be investigated at various scales to have a better understanding of the processes that drive it. Pumping, cast -in-place bridge components, and rock-filled concrete are three SCC constructionsresearch topics addressed. Finally, it is emphasized that further sustainability study is required.

**Key Words-**Self compacting concrete, Recycled Aggregates, Natural fibers

**INTRODUCTION:-** SCC “Self-consolidating concrete”, sometimes known as “self-compacting concrete”, is a non-segregating, a fluid substance that distributes into the desired location. It decongests clogged formwork without causing mechanical vibration. It flows easily into complicated forms and difficult-to-reach places, reducing voids in the process. The SCC is self-supporting and may be used even if reinforcement is crowded. It's a type of concrete that's both incredibly fluid and incredibly stable. The low yield value of the concrete has ability to segregate and maintain the homogeneity for transportation, ensuring the proper curing in order to Performa balance between stability and deformability. Since Japan was an earthquake-proneregion, the earthquake resistant structures were built by the strong beam- column joints using SCC where congested reinforcement exhibits. Since its introduction in Japan in the late1980s, self-consolidating concrete (SCC) has shown

significant commercial advantages for the construction industry in terms of ease of placement, negligible or no vibration, enhanced form finish, and the ability to use heavily congested reinforcement and form work with limited access.

Okamura and Ouchi have introduced the Self-Consolidating Concrete (SCC) into the concrete industry during 1988 focusing on durability aspects of concrete in their mind. They coined the name initially as high-performance concrete (HPC) because of meeting durability requirements. Later they modified the name as SCC. SCC was developed to satisfy the unskilled labor problems faced by the Japan construction industry at that time. In specific, a project called the construction of “Akashi-Kaikyo” bridge of Japan; there was a severe durability problem at the anchor age of bridges because of improper compaction of concrete. Hence to overcome the above issue, SCC at green state with higher flowability was used and elimination of compacting effort was investigated by them.

SCC is commonly popular in the preparation of:

- Concrete use for architectural purpose.
- Various horizontal elements
- Densely reinforced PC/PSC elements with a spacing of less than 1.5 in.
- PC/PSC components with 1.5 - in spacing are highly strengthened.