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Digital Reference Services in the ICT Based Agriculture Environment: A Study

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Abstract: - The digital reference service refers to the task of providing assistance to the library users in fulfilling their various information needs. The digital reference service has become an important part and parcel of the library services in the changing technological environment. The paper is an attempt to provide an overview of the digital reference services in agriculture libraries in the present day world.

Key words: Digital reference services, information communication technology (ICT)

Introduction: Digital reference service is the provision of the personal assistance of librarian to users involving collaboration between library users and librarian in a computer based medium. It includes the utilization of various media including e-mail, web forums, video chats etc. The first and the foremost objective of the library is to provide various types of services to users in order to meet their various information needs..The various types of library operations including classification, cataloguing, shelving, maintenance, serial control etc. are carried out to assist the users so that they can find the pertinent information with ease that too in least possible time. In the same scenario the task of providing personal assistance to users for satisfying their information needs refers to the reference service. Now a days in modern ICT based environment the reference service is not confined to only providing personal assistance to users but providing information services to the users/remote users whenever & wherever they need it and that too digitally available at their fingertips.(Chandwani, 2018)

Scope: The scope of the study is confined to the digital reference services in the present ICT based environment.

Methodology: A review based method was adopted for gathering of the required data necessary for the completion of the study. The literature search was carried out and the previous literature available on the digital reference services was thoroughly studied, reviewed & presented.

Objectives: The objectives of the study are enlisted below:

- 1 To provide an overview of the digital reference services
- 2 To study the importance of the digital reference services in libraries in ICT based environment.

Introduction: - The terms "virtual reference," "digital reference," "e-reference," "Internet information services," "live reference" and "real-time reference" are used interchangeably to describe referenceservices that utilize computer technology in some way.

Digital reference (or virtual reference) service is a service by which a library reference service is provided online and the reference transaction is a computer-mediated communication between the user and the librarian. **(Digital reference, 2018)**

Digital Reference is a service that provides users with answers to questions in a computer mediated environment.

Digital reference refers to a network of expertise, intermediation and resources put at the disposal of a person seeking answers in an online environment.

Digital Reference Services are Internet based services that employ human experts or intermediaries to provide information to users.

The terms "electronic reference" and virtual reference are often used synonymously with "digital reference", although virtual reference limitless by distance and physical space. In other context it is the "Contact between the right user and right information at the right time and in right personal way through electronic media". Virtual Reference work includes the direct personal aid within a virtual library to persons in search of information for whatever purpose & especially designed for making information as easily available as possible to users.

(Arya & Mishra, 2012)

Elements of Reference Service

There are three basic elements of the reference service:

- The user
- Information or Knowledge base

- Informational professional/librarian
- Electronic resources (including web resources, CD based resources & other digitized materials)

Types of Reference Services

There are two types of Digital/Virtual reference services:

1. Asynchronous Virtual Reference Service: It is a type of virtual reference service in which user/patron/client submits a question and the librarian responds after some time. In other words there is a time delay between the question being posed by the user and the answer being given by the librarian. Asynchronous virtual reference service takes the form of the following:

Email reference service: In this type of reference service a user sends a request in the form of email to librarian or specifically designed reference email Id by reference service section of the library. The user specifies his/her specific information need in the email. The librarian responds to the query accordingly. This is the simple, cheap & cost effective method of virtual reference service. Email reference service is the most widely service used among users as users can pose a question even if library is closed & it doesn't require any additional software to use the service. This service is available free of cost and no additional effort is required on the part of the librarian to implement the service. The email reference service is very much useful for the users have poor oral communications skill

Reference through Web: It is evident that even though the e-mail reference service is beneficial for users in its own way but there are several shortcomings of the service & the information professional's face a lot of problems as it is not a structured form of service. It does not provide complete details regarding the information needed by the user. In this regard new innovative technologies have been developed to add additional features to the service. Likewise Ask a librarian website has been framed out which is designed to provide a structured web form where user is asked to reciprocate to particular queries, in addition to their information needs. The web based form has to be accessed from library home page or reference web page. The required fields then have to filled in by the user and ultimately the

form is reverted back to the library through e-mail. web forums are created for digital reference services to help the users to be more productive to ask their queries.

2.Synchronous: In synchronous digital reference service the exchange of information takes place in 'real time' with an immediate response to the question. In this case there is a live interaction between the user and the reference librarian. It is therefore called as real-time digital reference service.

Chat using instant messaging: Instant messaging or online chat is one of the most common forms of web communication. It is more instant than an email reference service. The exchange of information between user and reference librarian takes place in real time i.e. there is live communication between user and the reference librarian. In this case same scenario is adopted to answer the question as in real reference desk. The digital reference librarian prefer web based electronic resources or electronic resources as these sources are easy to access, easy to keep & easy to share with the users. Speed of this service is faster than e-mail service as the users do not need to wait for the response. This service can be offered round the clock. Reference librarian tries to keep the interaction short to prevent the system from logging off and users from getting bored while introducing themselves. This should be taken into consideration by the reference librarian since average time of an interview in digital setting is ten minutes. Also this service needs instant messaging software to be installed on the users & librarians desktop to communicate with each other.

Video based reference service/video conferencing/web camera service: It is a video based virtual reference service. It is also called as video help. It was introduced to overcome the communication problems inculcated in text based services. This mode of communication involves visual elements where the reference librarian and the user can use both text and voice transactions & they can see & hear each other in the same manner as in face to face interview. Video conferencing is useful in distance learning, online lectures, and research and reference applications. It is also useful in off campus library services of university libraries. Now a days viva voce examinations & interviews are conducted via video conferencing.

2. Digital/Virtual Reference Robots: It is an artificial intelligence based service & is used to respond the questions during the unavailability of the reference librarian. The service involves the use of software to search the databases.(Chandwani,2018)

Implementation & maintenance of Digital reference service

- 1. Staff Training:** Staff training includes the virtual reference training. The library staff is being trained regarding the fundamentals of virtual reference services & the means by which it is provided to users.
 - 2. Recruiting new librarians:** The new recruitments are made in the libraries taking into consideration the new comers which possess extra ordinary skills in terms of providing digital reference services.
 - 3. Interface Design:** Interface design or an online reference desk is designed to allow the users to access various resources. The interface allows providing expertise to greater number of people irrespective of their language, technical capabilities & physical impediments.
 - 4. Prototype:** Creating & Testing the Service Virtual/digital reference service needs to be pre-tested before final implementation and making it available tousers.
- i. **Legal Issues:** It is mandatory for all information professionals to familiarize themselves with the current state of public information legislation in their state and when & where it affects the scope of digital reference services offered to share the information with their users.

Methods of evaluation of Digital/Virtual Reference Service

The evaluation of the service is an essential and necessary step in making the service a boon in the digital era. There are various methods of evaluation of digital reference service. They include

User feedback: The users are asked to give their feedbacks regarding the digital reference service provided by the library.

Rating: The faculty members and staff are asked to give ratings to the services provided by the library and accordingly we can evaluate a service.

Survey and Questionnaire: Survey by means of collecting data through questionnaires is also used as a method of evaluating digital reference service.

Interviews: Interview method can also be used to evaluate a particular digital reference service.

Case Studies: Case studies can also be used as an effective method of evaluating digital reference service. (R. Shimray, 2018)

Conclusion: - Digital reference services form a backbone of the information services in the libraries. They have transformed the entire skeleton of the reference services. The digital reference service has proved to be an efficient information service in the present digital era serving the users to their expectations.

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Effects of COVID-19 pandemic and role of the social media in Education

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Abstract:- Man is a social and rational animal on the planet. Man, always brags that no anyone can stop him from doing his activities and development. But since last two years his delusion was demolished by micro virus i.e., covid-19. Due this virus the globe become static and it creates paralyzes all the human activities and man feels helpless never before. The human life was influenced by this covid-19 pandemic and human being was under burden of this dangerous pandemic and struggling for the survival. In the beginning of this covid-19 pandemic the man thinks that the critical situation will be comes under control soon. But it takes too long tenure and still it will take some time to normalize situation. In this situation the human being was in lockdown of this pandemic. In the lockdown no anyone can come out form the home to meet others and communicate freely. In this critical situation the human being under the threat of covid-19 pandemic. In this critical situation the previous development in every field of human activity done by the man comes to an aid to control and overcome the situation. The development in Information and Communication Technology (ICT) and Social Media platforms emerges and powerful mean for human being to control the situation. Social Media networks, Internet plays vital role in sharing their feelings, to communicate each other, in this critical situation. It supports to provide to meet the emotional, intellectual informational needs of peoples, students, and research scholars, layman and all those who need to perform their duties in this pandemic lockdown. Social media like WhatsApp, Facebook, twitter, YouTube, Instagram, and snap chat are major source for spreading information and news in public.

[Key words: COVID-19, Pandemic, ICT, social media, Education]

Introduction: - Nature is the biggest educational institution as well as the teacher of human being. The human being experienced a lot form the nature. Human evolution was a long journey in which the man had learned a lot. The man had developed different things with his experience and rational thinking. The process of education is as old as the human being. From the beginning experience and education was the base for human development. So the education has the prime importance in the life of human being. In the course of development in different fields, there are some factors which force to mold and change accordingly and some of the factors pressurize to

mold accordingly to adopt the change. COVID-19 Pandemic influenced over the world to adopt the change in whole life style of human being. It affects each and every field of human activity and education is not exception for it. The covid-19 pandemic creates a critical situation for human being and posed a challenge for the human being for survival. It necessitates changing the lifestyle of human being and mold according to time required in covid-19 pandemic. In this critical situation those who change accordingly the requirement for survival they survived and those who are not changed accordingly they are suffered a lot for survival. Social, political, economic, health, education and cultural world of globe are under burden of COVID-19. In this context ICT plays very important role to handle the situation. In this critical situation the social media came forward to provide the educational services to the students to keep them busy in educational activities throughout the long period of lockdown which is very important for the academic career of the students.

Education:

Wikipedia defines–“Education is the process of facilitating [learning](#), or the acquisition of [knowledge](#), [skills](#), [values](#), morals, [beliefs](#), [habits](#) and personal development. Educational methods include [teaching](#), [training](#), [storytelling](#), [discussion](#) and directed [research](#). Education frequently takes place under the guidance of educators; however, learners can also [educate themselves](#). Education can take place in [formal](#) or [informal](#) settings, and any [experience](#) that has a formative effect on the way one thinks, feels, or acts may be considered educational”.

Social Effects of Covid-19 on education:

Educational Institutions Closed:–In the covid-19 pandemic all the educational institutions are closed. To avoid the covid-19 spreading the doors of the educational institutions are closed during the lockdown, resulted in break down the academic process and progress of the students. How much it hampers the academic progress and performance of the educational institutions and the students will be seen the coming period.

Break in Teaching –Learning Process:–Due to lockdown the educational institutions are closed. It causes the break in the teaching and learning process. Teaching and learning process in the classrooms are essential for the academic progress of the students. The teacher-student interaction is essential it will better possible in the class. It also affected by the covid-19 pandemic lockdown.

Break in Consistency in Learning:-Consistency is essential in learning process. The syllabus and the academic programmes are correlated with the standards or classes of the students. The syllabus for the students at different level is mostly based on the previous level. So to grasp and understand and for better performance consistency in learning process is essential to avoid the break in this process.

Isolation from educational environment:-The educational Institutions are closed due to covid-19 pandemic lockdown because of that the students are isolated from the educational environment. At the first stage of covid-19 pandemic lockdown they become totally isolate form their academic activities. Later on the educational institutions made the efforts to start the online classes to bridge the isolation gap to the students.

Psychological break in knowledge gaining process:-The whole world was under the burden of covid-19 pandemic and thinks about the covid-19 pandemic critical situation. In such a condition the student only thinks about covid-19.They are mentally under the burden of the covid-19 pandemic and they became isolate form their study. The students are also psychologically under pressure of the situation and not in condition to do the academic activities. The situation is also responsible to break in gaining the knowledge.

Social Media:-Social Media is one of the most important products of Information and Communication Technology. At present the whole globe is connected through this medium of communication. The people throughout the world are using this social media platform to interact with each other. In covid-19 pandemic lockdown people can came out form the home, meet and interact with each other freely. In such critical situation social media platforms emerged out as a powerful means to share the feeling with friends, relatives, interact with them during the covid-19 pandemic lockdown situation.

Definition:

Merriam-Webster Dictionary:-“**Social Media** is a form of electronic communication (such as websites for social networking and micro-blogging) through which users create online communities to share information, ideas, personal messages, and other content (such as videos)”.

Role of social media in Education in COVID-19 Pandemic:-Social Media is a powerful mean for mass communication based on ICT. In this information society also, there are two but opposite steams of thinking. One is shouting that social media is hampering on the reading and

academic activities of the students and responsible for declining the academic performance. At present the parents of students are doubtful about the use of social media for educational activities. But in covid-19 pandemic the picture is different and social media plays very important and unavoidable role in educational environment.

Social Media in Teaching Learning process:-Due to covid-19 lockdown all the educational institutions were closed for long period and teaching-learning process breaks. At beginning the people are supposed that it does not go for longer time and it will be controlled soon, but it was not happened and it takes long period to control the situation and still it is going on. So, the educational institutions were decided to start the teaching-learning process through online mode. In such critical situation social media became indispensable tool for teaching and learning process. There are restrictions for free moving in covid-19 lockdown no anyone cannot come out from their residence in this condition social media networks are only means to perform the teaching-learning process and it plays key role in online teaching -learning process.

Study from Home:-In COVID-19 Pandemic lockdown no one can come out and go to the work. In this situation most of the educational institutions are closed, but after some days, it became essential to carry out the educational activities. In this critical situation ICT come to aid to the educational institutions, teachers and the students to perform their tasks from their home. With help of ICT and Social Networking sites most of the institutions performed the educational tasks from home.

News Updating:-In covid-19 pandemic lockdown print media is totally closed and electronic media is only source of news and getting the new updates about covid-19 pandemic. In this situation social media played key role to interact with the Government missionaries NGO's, Volunteers, and the people in keeping the update about the pandemic situation. The people throughout the world became lonely and isolate and social media is only mean through which the people can share their feelings with friend's relatives to get some relief from this stressful situation. It is challengeable situation for the government as well as for the people to handle the critical situation social media networks, ICT, Internet, TV all these electronic media come to an aid.

Online Seminars /Conferences/Webinars:-In the COVID-19 Lockdown the whole world was closed. The most activities of human being were restricted due to pandemic. The intellectual world also had some restriction to meet, interact and communicate throughout the globe. The ICT and the social media make it possible to conduct the meeting, seminars, conferences, and webinars through online mode. In this pandemic situation ICT is at the Center of all human activities, because no nay one can come out from the home.

Library services:-Libraries always play an important role in overall development of human being. In pandemic situation libraries also closed at the beginning. But later the libraries started to provide the services to the users accordingly and as per the capacities with available resources with ICT and Social media Networks as and when possible. The library services are provided with aid of ICT and social networks. The libraries played active role in online teaching-learning process.

Newspapers/Periodicals:-The printing of the newspapers, periodicals was also affected and disconnected due to covid-19 lockdown and the newspaper reading is the habit of students. The transportation and circulation of new papers was also locked. In these situation e-newspapers, e-periodicals are provided by the libraries to the students to keep update about happening around the world.

E-resources:-Covid-19 pandemic lockdown restricted the free movement and meeting of the people. As the educational institutions were closed and students are also locked in the houses. At the beginning it was supposed that the situation will become normal and people will free to move, but it was not happened and the tenure of lockdown was increased. In such a situation people, students and parents became isolated and disturbed and reading is the best solution to make the idle minds engage. In the later period of lockdown, the educational institutions were started to provide the education to the students through online mode and libraries were also started to provide the e-newspapers, e-books and other e-resources to the students which is very important education.

Research Work:-Creativity and solutions are results of research which depends upon the information. The generation and usage of information is important for research and research is the original source of information. The free flow of information is very important for research

activities to avoid the waste of time, money and efforts. In the covid-19 pandemic most of the research activities throughout the world was hanged. In this situation the social media networks also play very important role in providing necessary information as and when possible.

Conclusion:-The man created a lot of things through his course of evolution. He achieved a lot through his creativity and development on the basis of his power of thinking. But during the covid-19 pandemic he lived under the pressure never before in the history of human civilization though he made the development in each and every field of activity. The covid-19 pandemic makes man forceto think about the situation and mold accordingly to control the situation though he had made the tremendous development in the field of science and technology. Consequently, it is also true that the development that he had made in this field come to an aid to overcome the critical situation.The social media plays key role to control the situation created by the covid-19 pandemic, when the man feels himself helpless. Social media played an effective role in engaging the people, parents, students during the lockdown period. It played active role in awareness about covid-19 pandemic, health care, social and physical distancing, and situation throughout the world. It played major role to bridge the gap between the students and education in the covid-19 pandemic which is very important because student is the future of the nation.

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Routing Protocol for Underwater Wireless Sensor Network: Survey Paper

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ABSTRACT:-To build affordable and portable IOT devices for underwater wireless sensor network (UWSN) is possible due to technological advancement in the field of IOT and Wireless sensor network (WSN). It is hot research area for researchers because of its application areas like collection of data, Ocean sampling, disaster prevention, geological processes supervising, underwater equipment monitoring etc., which are used for monitoring purpose. For making these applications feasible there is need of underwater devices communication within less time. To make this communication easy it is possible with designing of routing protocol. Here from that point of view various aspects of routing protocol for UWSN are observed and written.

KEYWORD - routing protocol, energy efficient, underwater, wireless sensor network, network life

1. INTRODUCTION

In protocol designing, network topology plays an important role. As the USWN faces many design challenges like low battery life, error rate is high, attenuation is high, and consumption of energy is more. Therefore to elongate the lifetime of UWSNs, many energy efficient routing protocols have been proposed. In this paper there is a brief review of routing protocols related work carried out in the field of UWSN. To design energy-efficient routing scheme for UWSNs and efficient data routing mechanisms WSN consist of low cost nodes with limited battery power and the battery replacement is not easy for WSN with thousands of physically embedded nodes, so there is need of employing routing protocol which is energy efficient and can offer a long life work time. As per need Section 2 describes the existing work of various routing mechanisms. Paper concludes at section 3.

2. RELATED WORK:-Here in this section we are going to review few of the existing work carried out in the field of routing protocols for under water wireless sensor network. Here in [1]

another recent hybrid clustering protocol for wireless sensor network has been proposed. This hybrid scheme makes use of common characteristics of HSA and PSO algorithm which are useful for energy efficient cluster head selection. The proposed algorithm exhibits high search efficiency of HSA and dynamic capability of PSO which improves the lifetime of sensor nodes. In this system the particles are moving from one region to another region with updation of velocity and position at the end of every round. High dimensional optimization limitation faced by PSO was overcome due to use of HSA by utilizing its high searching computational capability. HSA works in a particular region which was its limitation which was overcome by use of PSO as PSO can move from one region to another so as to find optimum solution. This algorithm works in two phases first is Parameter initialization and second is Particle position and velocity initialization with hybrid matrix and fitness function. However the hybrid solution leads to complexity and clustering overhead in network.

In [2], the recent approach for PSO (Particle swarm optimization) based clustering is proposed. PSO-UFC is fault tolerant and unequal clustering protocol. This protocol is introduced to address the problem of fault tolerance and imbalanced clustering issues in the existing energy-balanced protocol for enhancing the lifetime of the network operation. Authors have introduced a clustering mechanism based on PSO for solving the issues of hot spot in WSN. There is use of cost function derivation for balancing energy consumption of inters cluster and intra cluster in case of unequal clustering. So as to overcome fault tolerance problem there is surrogate CH election is done. To assure the connectivity in the master cluster heads of network, multi hop routing tree construction is done. The working of protocol is divided in two rounds which works with two phases in every round i.e. set up phase and steady state phase. However, using the PSO may take longer convergence time as well as poor accuracy of optimum solution estimation.

[3] As there is big challenge of reducing energy consumption and to improve packet delivery ratio in case of underwater wireless networks due to deploying of multi hop scheme. Keeping this in mind authors have introduced routing scheme for underwater called as AUV-aided Underwater Routing Protocol (AURP). This is an Autonomous Underwater Vehicle AUV-aided Underwater Routing Protocol (AURP) with autonomous underwater vehicles as relay nodes with short range and huge value of data rate for transmissions in underwater channel. Communicating between the underwater sensor nodes to the sink relies upon relay nodes which are analogous to

AUV with controlled mobility. Data from gateway nodes is collected by relay nodes and then it is passed to sink nodes. Large amount of data transfer is possible in a short range with high transfer rate is possible due to AUV with controlled mobility. The data transfer is done through different ways like using direct acoustic links, in multi hop way and the combination of multi hop and direct acoustic links. There is use of Pheromone for determination of path from underwater sensor nodes to sink nodes which are also useful for finding path length. So that path length can be reduced. Results are carried out with NS2 simulator by incorporating different movement pattern of AUVs and realistic underwater channel model. As per result it is a good protocol for routing to achieve less energy consumption and high data delivery ratio. Also it is practically applicable for highly reliable data transmission in large quantity. However, the extra energy cost involved by AUV makes this protocol unsuitable for UWSNs.

In [4], an Energy efficient routing protocol has been proposed for underwater wire-less networks .It is based on the forwarding criteria of depth, residual energy and optimal distance from the source. The source node provides flexibility in transmission power according to the destination so that the signal reaches with the same transmit-ted power. Sender node maintains a priority list of forwarder nodes as per forwarding criteria .Too choose the next forwarder node it makes the use of energy minimization information of optimal hop position. The optimal hop position based energy efficient routing is divided into two phases. In the first initialization phase it checks the node identity, position of forwarders then priority has been assigned with residual energy value. In the second data forwarding phase, it checks the availability of packets for forwarding and forwards checking its packet history buffer to avoid redundant packet forwarding and provides the correct priority based on the residual energy and distance. When the packet is forwarded to next node it will remain there for some time, those nodes which are having high residual energy and hop position as an optimum value HAS minimum holding time. By making use of optimal hop selection there is less energy consumption in network results in prolonged network life. Here in this paper comparison of proposed protocol is done with EEDBR and simulation results shows about its better performance than EEDBR. The protocol uses courier nodes which are similar to Autonomous Underwater Vehicle (AUV) and in turn increases the excess energy cost rather than focusing on internetworking with sensors.

In [5], Authors have introduced a state of art routing protocol for UWSN which is geographic and opportunistic called as GEDAR. This protocol is based on void nodes depth adjustment within controlled network topology. For routing data to the destination it uses the mechanism of greedy opportunistic routing. In this local maximum routing recovery uses a network energy consumption model based on the communication range (nodes within the transmission range) and carrier sensing range (nodes that exclude the other nodes within the communication range), where the carrier sensing range was greater than the communication range. When a node has been struck with voids, it increases its communication range by adjusting its transmission power to overcome voids. Initially, each node tries to route towards a node with minimal hops and energy consumption. As per simulation result with comparison of other scheme GEDAR has provided improved packet delivery ratio. As a future work they have thought to cover more area through sensors through impact of nodes depth adjustment. The problem with this type of approach was increasing the communication range also increases the interference from other nodes.

In [6], Weighting Depth and Forwarding Area Division DBR (WDFAD DBR) protocol with multi-sink architecture and anchor nodes, relay nodes and sink nodes has been discussed. The relative coordinates of nodes are being available based on the RSSI (received signal strength indicator). It uses the criteria of depth of the present forwarder and then anticipates depth of the adjoining hop of forwarding node with lower depth. Packet holding time has been calculated by weighting of the aggregate which is between 0 to 1 weight value and the depth difference of the two hop neighbour. Efficient use of energy consumption has been optimized by dividing the forwarding area which has been classified as primary forwarding area and auxiliary forwarding area using nodal density and channel state it avoids duplicate packet transmission. As per authors this approach is unique in terms of forwarding nodes selection, neighbour node prediction and routing performance analysis. Proposed system is unique than other system in terms of selection forwarding nodes, prediction of neighbouring nodes and routing performance analysis. In case of selection of forwarding nodes for hops depth difference weighting sum calculation nodes depth considered are not only current nodes depth but also next expected nodes are considered. In case of neighbour node predication and forwarding area division approaches used are designed in such a way that to reduce consumption of energy due to neighbours request and duplicated packets. Channel contending is considered in terms of consumption of energy, average of end to

end delay and packet delivery ratio, for theoretical routing performance analysis. Validity and effectiveness of this proposed protocol is simulated with NS3 simulator. The problem with this protocol imposed the design on RSSI which determines the relative distance between the node and any deviation will lead to communication void.

In [7], author proposed energy efficient chain based routing protocol for underwater wireless sensor networks (E-CBCCP). Underwater have many of complex features like dynamic environment, network topology, mobility of nodes etc. By considering all these factors authors have proposed this routing protocol. While at the time of data transmission there is consideration of role changing of relay nodes, cluster heads and cluster coordinators to maintain the other nodes load. As per proposed system complete network is divided in to clusters. Each of this cluster is nothing but sub region. Here each of sub region consists of cluster head and relay nodes. Each of cluster head collects data and transmit that data to next higher level sub region. In higher sub region transmitted data is submitted to cluster coordinator. To forward data normal nodes cooperate with local sub regions relay nodes. To avoid the transmission of duplicate data packets cluster heads and relay nodes are allowed to store that data. Here communication is location free which is based on nodes hop count and confidence level.

In [8], novel routing protocol for underwater networks proposed to solve the routing problem voracious routing systems as a basis. They achieved new routing by VBF algorithm improvement, where route pipe radius is considered as base. This algorithm uses radius of routing pipe as function. There is consideration of various parameters like number of nodes and range in this function. If any of parameter is changed routing pipe radius also get changed. Proposed method assumes that sender's node energy required for packet receiving is less than that of recipient node then consumed energy can be reduced. There is chance to get selected as guiding node if radius of routing pipe get reduced for other nodes. NS2 simulator is used for result comparison with other protocols like HHVBF ,VBVA and original VBF protocol. The parameters used for comparison are delivery of nodes and consumption of energy if network size. The proposed system achieves better performance in case of less energy consumption for more size of network and successful delivery of packets.

In [9], this paper there is proposal of EECOR protocol which is helpful to improve consumption of energy. As per proposed system data packets are forwarded to sinks on the surface. Based on

forwarder local information, source node first determines the forwarding relay set. Then by considering probability of packet delivery and consumption ratio of energy there is selection of best relay is done. This selection is done by use of FLRS ie. Fuzzy logic based relay scheme. The lifetime of network can be improved. Due to collision occurrence in between the sensor nodes much of energy is wasted. So as to avoid this authors have introduced concept of timer to every forwarder. Authors have carried out simulation results by use of underwater simulator called aqua-sim which is NS2 based. By comparing these results with various existing algorithms they proves that EECOR gives better performance related to consumption of energy, delivery ratio of packets, end to end delay and lifetime of network. As a future work authors have suggested to make use of fixed and mobile nodes ie. Hybrid network with various ML based algorithms for getting better performance.

In [10] Here authors have introduced a routing protocol called as BEAR(Balanced Energy Adaptive Routing) . Main objective of this protocol is to enhance the lifetime of UWSN with energy efficiency. They have introduced concept of IOT enabled devices concept in BEAR. The problem of inefficient and imbalanced utilization of energy is solved with the use of this protocol. Here the network is logically divided into sectors like intra sector and inter sector for balancing consumption of energy. The functionality of BEAR protocol consists of mainly three phases: 1) initialization 2) Construction of tree and 3) Transmission of data. In the first phase ie. Initialization phase information about location and residual energy level is shared by nodes. This information is used by BEAR protocol for selection of neighboring nodes in second phase ie. Tree construction phase. Based on cost function the same information of location and residual energy level of nodes is useful for selecting the successor and facilitating nodes. The criteria for choosing the best successor and facilitating node is that those nodes which are having more residual energy than that of a average residual energy of network. This will help to balance the consumption of energy in all the successor and facilitating nodes. However the problems with this are: (a) this protocol consider only two parameters such as residual energy and location of nodes while forming the tree; however the other parameters such as packet delivery probability and nodes degree not considered which may creates the data loss problem and unreliable communications. (b) The UWSNs are large-scale and may consist of 1000s of sensor nodes, the BEAR protocol may failed to achieve the efficiency for such networks due to their complex steps of data transmission.

In this paper for randomly deployed and grid based UWSNs authors have introduced two multimodal acoustic-RF adaptive routing schemes. They have taken into consideration about reliability and end to end packet latency. For selection of for-warding node in next hop, algorithms discussed here are balancing the routing channel quality, distance of that node to sink and residual energy. As a future work authors have mentioned to work in real test beds for improvement of protocols performance [11].

As per study of shadow zones are responsible for reducing the routing protocols performance. To address this problem here in this paper authors have introduced SZAR protocol [12]. To control the mobility of node, the deployment of nodes is done in lower and upper depths. As per name this protocol avoids the shadow zones by back routing acknowledgement method along with selection of forwarding nodes with optimal route. As per result analysis when it is compared with VARP and VHGOR it performs well.

There is biggest issue of energy consumption while at the time of designing a routing protocol. This issue is addressed here by author with introduction of EE-OR protocol for UWSN [13]. Consumption of energy and delivery ratio of packets are the attributes used for checking the performance of this protocol. Here the main focus was given on said attributes while at the time of selection of candidate set. By comparing with DBR protocol which is standard protocol, this gives better result.

Main focus of this paper [14] is to address the problem of improving node link quality and battery lifetime. CMSE2R works in four different phases like setup of network, formation of the cluster, for related cluster development of multipath and at last to forward the data. By keeping courier nodes fixed node link quality can be improved. Also it reduces the consumption of energy by cumulative distance calculation. As per author they have compared this protocol with CBE2R and EMGGR for addressing said problems and it is observed that proposed protocol gives better performance. AUV based one more energy efficient routing protocol ie. ARPA is introduced here [15]. Here this protocol works in two stages like forming network layer and transmission of data. AUV act as destination node. Vertical and horizontal mechanisms are taken into consideration for selection of forwarding node. As per comparison with attributes like transmission of data, delay in network this protocol give better efficiency and stability.

3. CONCLUSION:-Thus we have seen various existing routing protocol for UWSN. These protocols are getting more and more better performances as compared to previous system. In today's era there is need to work on such a routing protocol which gives better performance and can be applicable for all situations. There can be use of new technologies like Machine learning algorithm, AI or IOT in the area of UWSNs for getting better performance.

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Need of An Intelligent and Smart Water Management: A Survey

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Abstract :- According to a United Nations estimate, 50 percent of the world's population will face severe water scarcity. Countries in Africa and Asia that are still developing, such as Cambodia, Bangladesh, China, and India, are more prone to confront water scarcity. It is estimated that 70% of India's population will depart the city by 2050. It is difficult to feed and provide resources such as water and energy to such a large population due to dwindling water reservoirs, limited rainfall, and other factors. Water resources can be controlled and preserved for future use using sensors and information and communication technology (ICT). Sensors enable real-time hydraulic data monitoring, as well as automated control and alarms in the event of an occurrence.

Keywords: - ICT,IOT, Smart Water Management & Machine Learning

1. Introduction:-Water scarcity in India is an ongoing water crisis that affects nearly 1 million people each year. In addition to affecting the huge rural and urban population, the water scarcity in India also extensively affects the ecosystem and agriculture. India has only 4% of the world's fresh water resources despite a population of over 1.3 billion people.^[2] In addition to the disproportionate availability of freshwater, water scarcity in India also results from drying up of rivers and their reservoirs in the summer months, right before the onset of the monsoons throughout the country.



Fig:1 People crowd around a water-tanker and Women carry pitchers filled with drinking water in Ahmedabad

The crisis has especially worsened in the recent years due to climate change which results in delayed monsoons, consequently drying out reservoirs in several regions. Other factors attributed to the shortage of water in India are a lack of proper infrastructure and government oversight. and unchecked water pollution.

2. Litreature Review

Andrea Zanella, Nicola Bui, Angelo Castellani, Lorenzo Vangelista ,(2014) addresses specifically to an urban IOT system for a specific domain because IOT is very complex technology and discussed the comprehensive survey of the enabling technologies, protocols and architecture for an urban IOT .Also presented the technical solutions and best practice guidelines adapted in the Padova smart city project, Italy [1].Anjana et al(2015), presented an IoT design that eliminates the typical manual method for real-time water flow metering and quality monitoring. The inquiry looks on new difficulties in the water sector, such as billing ease, fair billing, supply versus consumption data analysis, and monitoring water quality indicators with pH and ORP sensors [4].

Kulkarni and Farnham (2015) conducted case studies in situations involving two European utilities to address issues including as leakage management, demand management, and asset management. The research attempted to see how wireless connections affected the overall performance of IoT water management technologies [5].

Koo et al. (2015)proposes a conceptual design for an IoT application for collecting Big Data from a large number of water clients Data mining is defined as the process of identifying key indications from the water system, such as pressure, flow, illegal water consumption, and the location and quantity of water breaks and losses[6].

Navarro-Hellín et al. (2015) developeda water supply management architecture for an irrigation system Wireless nodes with GPRS connectivity are included in the architecture. To achieve autonomy, each wireless node makes use of solar energy. It installs sensors to monitor a wide range of soil, plant, and atmospheric characteristics. These data are then transferred to a remote database and stored, allowing for additional analysis[7].Kartakis et al. (2015) developed a tool for monitoring, regulating, and simulating smart water networks was developed. The water distribution network studies allow for the evaluation and identification of dynamic events (such as leaks) as well as energy optimization. Furthermore, the findings aid managers in making decisions [8].

3. Research Metholody:-An intelligent water system plays an essential role in finding out the solution to various challenges like water scarcity, quality of water parameters like pH ,presence of chlorine in water Due to that cancer problems increases leakage of water etc.Due to high energy costs related to water supply ,the impact of climate change on water scarcity and increased consumption resulting from improving life styles standards are challenges that government face every day. so there is need for a more appropriate way of optimizing water resources.

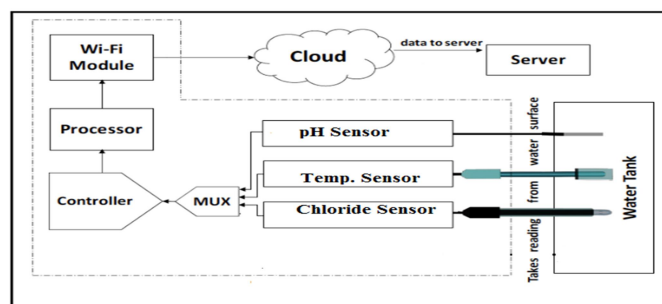


Fig:2 The flow of data from sensors to server

We offer an Internet of Things (IoT) enabled multi-parameter water quality monitoring and contamination event detection kit. The proposed kit may collect real-time data from the major water resource, analyze it, and display it on a simple platform for monitoring. It can monitor temperature (T), pH, and chloride concentration, which are all significant indicators of water quality. It may also pre process data before uploading it to the cloud to determine water quality using the onboard processor. Users can monitor water quality on a regular basis as a graph and in a variety of ways by login into their web account. We are estimating the future demand for water and its quality using a Machine Learning system. The Random Forest technique is employed in this case. Random forest is a flexible, user-friendly machine learning technique that, in most circumstances, produces great results even without hyper-parameter tweaking. It is also one of the most extensively utilised algorithms due to its simplicity and versatility (it can be used for both classification and regression tasks).

Random forest is a supervised learning algorithm. It makes a "forest" out of a collection of decision trees.

Random forest is a learning algorithm that is supervised. It creates a "forest" out of an ensemble of decision trees, which are commonly trained using the "bagging" method. The bagging method's basic premise is that combining several learning models improves the overall output.

Simply put, random forest combines many decision trees to produce a more accurate and stable prediction.

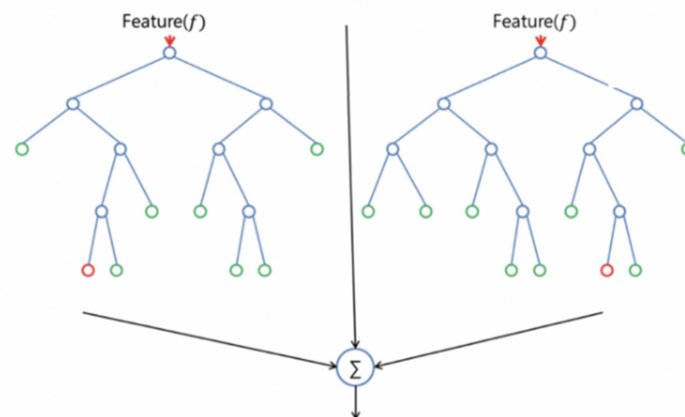


Fig:3 Random Forest Algorithm

4. Results

In this project we are going to use machine learning for future prediction of water demand.

We have created the Web based Server to control our whole system this server is designed using the PHP backed Programming Language. And HTML, CSS, JavaScript in frontend. we will also used solenoid sensors for managing the water demand.

5. Conclusion

The quality of water is a very serious factor that can affect the life of any living thing. In our system we are going to determine the water quality parameters like pH, Turbidity, temperature and Chlorides content in the water that are going to distribute in a particular area. Also we are going to implement an intelligent system that can predict the future demand and water quality for the future. Our system is real time based. We are comparing this real time data with the previous data and check the effectiveness of the project. In our project we are using IOT, Cloud and machine learning.

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USE OF BLOCKCHAIN TECHNOLOGY IN INDIAN HEALTHCARE
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ABSTRACT:-The study pioneers blockchain research by presenting a consistent and systematic review of current applications or integration of Blockchain technology in healthcare in India. Blockchain is essentially a new age peer to peer data system that manages data collation, certification, real time contact tracing /tracking through GPS & BLUE TOOTH using date & time stamped blocks through cryptography and works in a decentralized manner over the computing network. with advent of smart phones, India has tested and perfected API managed cross-platform **Arogya Setu** app on IOS & Android, besides numerous other platforms. One App that manages covid-19 vaccinations, contact tracing & alerts, shares real time data of infections, location and venues of vaccination centres, emergency health care numbers & inventory of RT-PCR testing, besides providing Vaccination Certificates that can be linked to Passports. In this paper, systematic literature review aiming to produce new source of evidence, signifying the use of Blockchain technology by Govt. of India initiative led Aarogya Setu, we identify potential applications of the blockchain technologies in healthcare in current scenario in India. The comprehensive review looks at how the **AAROGYA SETU** has transcended from sandbox to digital content mapping, storing and applying in real time recognising the potential of blockchain based approaches in the purpose of healthcare information and use of digital data. We identify how Aarogya Setu application implemented as ambitious project under collaborated efforts of **MOHFW, NITIAYOG, ICMR, PPP PARTNERSHIPS** and presents research opportunities, challenges for the future advancements and directions for the benefits of researchers and professionals.

Keywords: blockchain, healthcare, Aarogya-setu, covid-19 vaccine certificate, co-win

INTRODUCTION:- Blockchain is considered as a ledger system that assists in managing and storing data in time- stamped blocks that works mainly in decentralized manner over any computing networks and linking using cryptography. India launched contact tracing app **Aarogya Setu** and hosted cross-communication platform for 12 languages that are supported through the App, both on IOS as well as Android. The advantage of having initiated this revolutionary solution has gained success as India has administered over 100 crore Covid-19 vaccinations and digitally delivered certificates, with cross confirmation on both Arogya Setu App as well as on co-win app with time stamps. The breakthrough milestone has generated over 30% fully vaccinated certificates that allow restriction free travel for fully vaccinated individuals. Pioneered by PPP partnership with Blockchain technology that has gained recognition in the fin-tech area, the blockchain capabilities has a potential of wider application in various sectors and industries. Blockchain promises revolutionary changes across different industries, viz fin-tech, government, healthcare and covid-19 contact tracing individuals, that is perfected by geo-location (GPS) and bluetooth. The technology support is front ended by “BEL-YO, an entity that has been formed with I IIT. B funded by emphasis and developed jointly with Belfrics-BT and Yosync. The key takeaway is the runaway success of transforming Indian covid-19 scenario and the ability to convert paper assets to digital assets. The benefits include reduction

in costs and complexity of transactions between parties, enhanced security, improved transparency, certification and regulation.

Healthcare is predominantly a traditional industry that is considerably rigid to measure due to the facts of change and resistant to innovative practices. Blockchain technology, characteristics of decentralized ledger technology with greater transparency, improved security and privacy, increased traceability, boosted efficiency and reduced costs. Blockchain is defined as an aggregator in collection of records, usually referred to as blocks that are linked together using cryptography in such a way that does not allow modifications and promotes transparency and security.

Owing to its unique peer-to-peer networks, one of the benefits of using blockchain is, it updates with real-time, leaving no space for intermediaries and associated costs. Being resistant to change or edit, blockchain offers a transparent environment where health professionals as well as patients are able to access records seemingly and without added costs. It also increases security of the system by reducing the chance of lost records and manual errors.

OBJECTIVES

1. To evaluate the use of Blockchain technology in India with the effective use of Aarogya Setu App
2. To examine the seamless connectivity between all the stake holders engaged in tracing, vaccinating and certification through peer to peer communication channel.

HYPOTHESIS

1. Use of new age technology (Blockchain) to spearhead the battle with raging covid-19 pandemic
2. To have access to real-time data /results to achieve information on covid-19 infections /vaccinations and keeping India safe from covid-19 infections.

DATA COLLECTION METHODOLOGY:-The Secondary method of Data collection used and information obtained from various Newspaper Articles, Govt publications, Electronic Media, Visual Media, Aarogya Setu app , CO-WIN & W.H.O (World Health Organisation) websites, Scholarly Articles, Ministry of Health and Family Welfare (MOH&FW), Niti Ayog, Ministry of Electronics & information Technology (MEITY).

REVIEW OF LITERATURE

Blockchain is a decentralized ledger systems that allows independent agents to collaborate within the ecosystem ensuring transparency and time-stamped recording of the information to bring improvement in processing speed, revenue generation, security, while decreasing risk and costs. Blockchain uses a peer-to-peer (P2) network unlike traditional ways to store information on one central point, involves multiple copies of the same data that are stored in different locations and different devices. A peer interfaces a portion of computing resources or devices, to be used by other participants without the need for central coordination by servers. Such nodes tend to take different roles within the network while ensuring preservation, coordination and security of business data exchanges. **Aarogya Setu** displays a unique feature that communicates in over 12 Regional languages through smart phones. API can be downloaded on GitHub <http://www.gitbhu.com/aarogyasetu>.

WHAT IS BLOCK CHAIN

Blockchain Technology is all about removing manual interface and converting Paper Data to Digital data on real-time basis, increasing the security of various transactional activities in the healthcare space, while eliminating manual inefficiencies, improving quality of care and managing patient's data. Data that is available 24X7 to all the stakeholders . It also helps in

medical emergencies / accidents when the affected individual does not have a companion to provide information. Blockchain is a decentralized data of digital records linked together by cryptography. Each record is known as a "block". Every block contains a cryptographic hash of the previous block eg: a mathematical algorithm, a timestamp, and date of the transaction. Blockchain technology is developed to be a secure open ledger to record digital transactions, managed by a peer-to-peer network are advantages with implementation of blockchains in healthcare space.

Key concerns with blockchain applications in healthcare include: Network infrastructure security at all levels, identity verification and authentication of all participants Uniform patterns of authorisation to access electronic health information, DLT can be applied in virtually any healthcare areas, however, all activity within healthcare is not linked to transactions.

INDIA PIONEERS BLOCKCHAIN TECHNOLOGY WITH AAROGYA SETU APP

AAROGYA SETU app works simultaneously with 1. Testing Labs, 2. Analysed samples at Authorized Labs, 3. Its mandatory for the Lab to upload the test results to **ICMR** Portal. It is mandatory for Aarogya Setu to record, whether you have tested +ve, 4. if you test +ve, ICMR updates your details with Aarogya Setu App, 5. Aarogya Setu initiates Change your status to (RED) COVID +ve & activate contact tracing. The app then further demonstrates its efficacy by alerting other users in vicinity of covid-19 infections, through geo-location.

This revolutionary method perfected & adopted by the Ministry of Home & Family Welfare has been a boon for India to combat covid-19 pandemic in India. Aarogya Setu app is further wire-framed with Covid updates (with zero latency or delay), Vaccination details including instant downloads of Certificates and Co-win Portal. Such mastery on use of highly sophisticated processes have been cornerstone of success for the Govt of India, to have achieved enviable Milestone of administering over 1 Billion vaccines as on 22nd October 2021. Aarogya Setu has overcome language and education barriers in all class of people in India and is available in 12 Indian Languages. The government launched the Aarogya Setu contact tracing & covid-19 app in April to notify and alert users when they come in close contact with a Covid-19 infected person. The app also makes users aware whether they have chances to get infected with the virus. Few weeks after the app was launched, cyber law hackers and critics had said the app was too closed in nature and without adequate data protection measures. Following this, the government released the source code of the app in an attempt to promote transparency, on GitHub.

Applications in healthcare

Blockchains in healthcare can be interfaced in five primary areas:

1. Managing electronic medical record (EMR) data
2. Protection of healthcare data
3. Personal health record data management
4. Point-of-care genomics management
5. Electronics health records data management

Research

Currently, electronic health records allow automatic updating and sharing of medical information on a given patient within an organisation or network of organisations only. This could be extended if the information was organised such that a set of information on the topmost layer of the blockchain was only that which was not PHI or personally identifiable information (PII). This would allow researchers and other organisations to access this wide spectrum of data, with cohorts of hundreds of thousands of patients. The availability of massive database would greatly

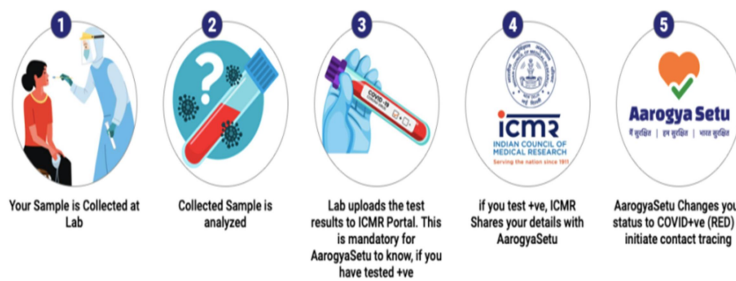
promote clinical research, safety event and adverse event reporting and identification, and public health reporting.

Seamless switching of patients between providers- The same information on the blockchain could allow individual patients to easily unlock and share their health data with other providers or organisations, through a shareable private key, created during block creation. This could greatly benefit to make health information technology interoperable and collaborative between different users.

Faster, cheaper, better patient care:-Blockchain creates a single system for stored data, constantly updated, health records for secure and rapid retrieval by authorised users. By avoiding manual intervention between different healthcare professionals, involved in caring for the same patient, innumerable mistakes can be prevented, faster diagnosis and interventions become possible, and care can be personalised to each patient including during accidents / emergencies of various natures.

Interoperable electronic health records:-The blockchain provides a single transaction layer where Govt /organisations can submit and share data through one secure system, by storing a specific set of standardised data on the chain, with exclusive encrypted links to separately stored information such as radiographic or other images. The use of smart contracts and uniform authorisation protocols can immensely support seamless connectivity.

— How AarogyaSetu Knows about your COVID-19 positive status?



Home Latest Updates Resources Awareness District-wise COVID-19 test positivity rates Search:

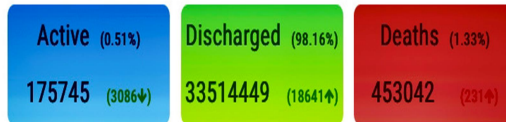
Helpline Number :+91-11-23978046 Toll Free : 1075 Helpline Email ID : ncov2019@gov.in Covid-19 facilities in States & Union Territories



For Information on COVID-19 Vaccine

India COVID-19 Vaccine Tracker

COVID-19 INDIA as on :
22 October 2021, 08:00
IST (GMT+5:30)
(11 Status change since
yesterday)

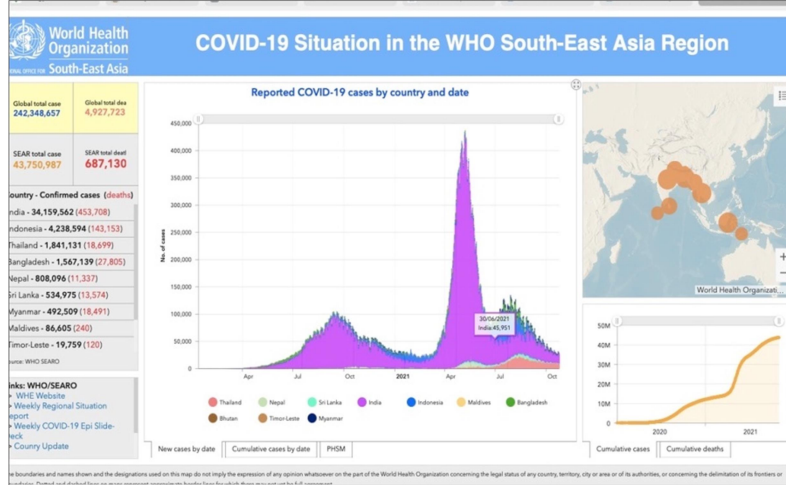
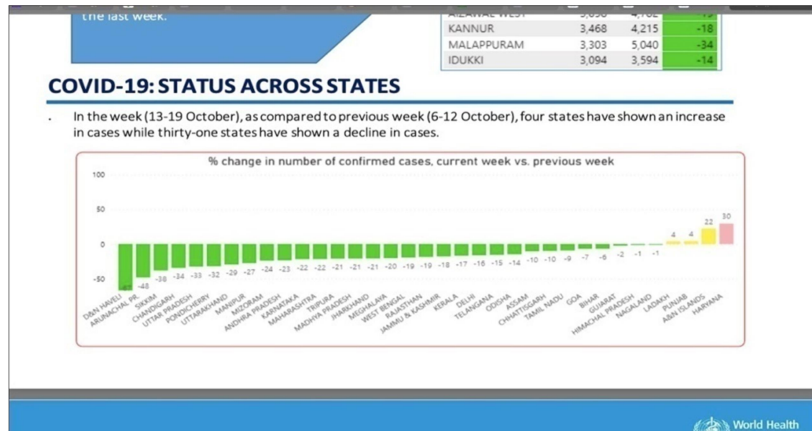


Resources
State Data

COVID-19
Vaccination as on :
22 October 2021,
08:00 IST
(GMT+5:30)



Vaccination
State Data



SUGGESTIONS AND RECOMMENDATIONS:-The health insurance ecosystem in India consists of multiple key stakeholders viz. insurance companies, beneficiaries, provider hospitals, third-party administrators (TPAs), intermediaries, reinsurers, Insure Techs, start-ups, diagnostics, pharmacies, value-added service providers, government regulators and the government as a buyer of social insurance schemes. These stakeholders interact through a complex network of interdependent and paper-/data-intensive workflow mechanism. However, the interaction amongst different stakeholders is usually not accurate or marred by piecemeal flow of information. To improve the interaction process, it is important to develop a trusted blockchain network that would improve execution of processes through multiple nodes in a decentralized manner with audit-ability, traceability and immutability.

Integration of Blockchain technology could be the ideal disruptive mechanism to maintain records and execute transactions through participation of all stakeholders in an accountable way. Blockchain automatically collects records of patient's agreements such as policy terms, agreed tariffs and relevant information, linkage information and execute using smart contracts based on pre-defined business rules in a transparent, immutable and non-disputable manner. The records will be accessible and they are secure & tamper-proof, the concerns related to data security and privacy would be duly addressed. Adopting Blockchain technology may go a long way in ensuring continuous trust, improving customer experience and thus aiding in the further growth of health insurance penetration. Blockchain technology has gained popularity as a solution for health data management and health information exchange.

The study recommends the use of Blockchain technology in Indian Healthcare systems as it's rampant with scattered data and mostly misplaced too. It's imperative for the Govt. of India to consider implementing similar Blockchain technology in various healthcare schemes like Aayushman Bharat and many more to come, as the result ensued after the launch of multi-tasking Aarogya Setu App is phenomenal.

Wire-framing health care services with a single App may ensure credible data and that can be assessed by all through smart phones. This game changing use of technology might lead to saving lives during accidents casualties at numerous locations.

CONCLUSION:- India has engaged with the covid-19 pandemic in a novel way, unleashing latest digital technology and managed a staggering number of vaccinations - 1 Billion and still counting. This feat is being felicitated worldwide including World Health Organization. Setting a benchmark of using Blockchain technology for Healthcare, India has demonstrated extraordinary leadership in combatting covid-19 pandemic. As regards to the security of Data, the security of the blockchain is implemented using cryptographic keys, a distributed network and a network servicing protocol by recording information in a block. Once information e.g. a transaction request is validated, subsequently meta-data is recorded in a block and cannot be disputed, removed or altered without the knowledge and permission of those who created the record as well as the network. When a block is added to the chain of other blocks it remains unchanged. Aarogya setu has proved to be the game changer in combating covid-19 pandemic.

INDIA ACHIEVES 1 BILLION VACCINATION MILESTONES ON 22ND OCTOBER 2021

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EARLY SKIN-TO-SKIN CONTACT WITHIN FIRST HOUR OF BIRTH IS IMPORTANT FOR MOTHER & HER BABY

Abstract: - The newborn baby placed on mother's chest with skin-to-skin contact could also be regarded as attempting to initiate breastfeeding. When newborn babies placed on mother's chest with skin-to-skin contact would naturally make predictable movements or crawl towards the breast and are likely to initiate and successfully continue breastfeeding afterwards. 'Early skin-to-skin contact and the opportunity to suckle within the first hour or so after birth are both important. However, contact and suckling are so closely interrelated the infant should be left with the mother continuously from birth, and allowed to attach spontaneously to the breast whenever she shows signs of readiness to do so. A practical minimum recommendation is for skin-to-skin contact to start within at most half-an-hour of birth and to continue for at least 30 minutes. Crawl is an inherent impulsive action of the human neonate. The child is able to suck on his own when he is lying upside down on his mother's abdomen. Every neonate has this ability immediately after birth as soon as he is placed on the mother's breast and decides for him/her self when to breastfeed. In the first hour of birth, this process of feeding the mother's milk in an organized manner is being considered all over the world. In the beginning, the newborn starts sucking and rooting activity on its own and takes its hands in its mouth then together it starts the process of sucking very fast, which starts sucking the breast.

Keywords: -Skin-to-skin contact, Birth, Mother, Newborn, Crawl

Introduction:-Mother milk is the best diet for a baby. Breastfeeding is the only suitable natural food for the baby. It is an automatic way of providing food to the baby. Breastfeeding can save a lot of life; approximately 1.3 million babies are a year. Mother's milk contains all those nutrients which are necessary for the development of the child. An increased rate of breastfeeding can save the lives of more than 3500 baby's every day. Initiation of Breast feeding is the time just after birth when mother attempted to initiate breastfeeding regardless of whether breast milk had arrived or not. A mother putting her baby directly to her breast and trying to get the baby's mouth to latch to the nipple is an attempt to initiate breastfeeding. Similarly, having the newborn baby placed on mother's chest with skin-to-skin contact could also be regarded as attempting to initiate breastfeeding. When newborn babies placed on mother's chest with skin-to-skin contact would naturally make predictable movements or crawl towards the breast and are likely to

initiate and successfully continue breastfeeding afterwards. The breast crawl was described 20 years ago, but it has failed to reach the beneficiaries (i.e. mothers and baby). WHO, UNICEF and BFHI have evolved 'ten steps to successful breastfeeding' were described in 1989. Through the 4th step remains unchanged, the interpretation has changed with time. The initiation of breastfeeding comprises of two components i.e. skin-to-skin contact and suckling. 'Early skin-to-skin contact and the opportunity to suckle within the first hour or so after birth are both important. However, contact and suckling are so closely interrelated the infant should be left with the mother continuously from birth, and allowed to attach spontaneously to the breast whenever she shows signs of readiness to do so. A practical minimum recommendation is for skin-to-skin contact to start within at most half-an-hour of birth and to continue for at least 30 minutes. Revised BFHI guidelines (UNICEF/WHO, 2006) interpret 'step 4' as 'place babies in skin-to-skin contact with their mother immediately following birth for at least an hour and encourage mother's to recognize when their babies are ready to breastfeed, offering help if needed. When a newborn is placed on the mother's abdomen immediately after birth, they have the ability to automatically find the mother's breast. He decides on his own when to breastfeed the first time. It is called breast crawl. It was first narrated in 1987 at Karolinska Institute in Sweden. Previously, after the birth of the baby, standard care example drying, suctioning, administration of vitamin K was done thereafter they hand over the baby to the mother for breastfeeding.

Crawl:-Crawl is an inherent impulsive action of the human neonate. The child is able to suck on his own when he is lying upside down on his mother's abdomen. Every neonate has this ability immediately after birth as soon as he is placed on the mother's breast and decides for him/her self when to breastfeed. In the first hour of birth, this process of feeding the mother's milk in an organized manner is being considered all over the world. In the beginning, the newborn starts sucking and rooting activity on its own and takes its hands in its mouth then together it starts the process of sucking very fast, which starts sucking the breast.

Natural flairs Behind Breast Crawl:

1. Sensory input

A. Olfactory:- apart from milk formation, there are some glands in the breast of the mother, which produces an attractive aroma. The newborn is able to recognize the unwashed breast of

the mother more than washed because it probably not smells. Later Veranda et al (1987) coat amniotic fluid on the mother one breast and one remain the same, as soon as the baby placed on mother's abdomen the baby is able to recognize breast coated with amniotic fluid. This seduction seems to be built on olfactory signals. In this way like natural fragrance, the amniotic fluid attracts towards mothers breast.

- B. Visual:-**Within a minute after birth, the baby follows a face like a pattern more than other patterns of similar brightness Illing worth (1987)A newborn can recognize their mother's face (Bushnellet al, 1989) and can follow it for a short distance (Brazelton and Cramer, 1990). Some babies start sucking activity soon after when the baby is placed near the mother's breast, but lots of babies start licking and staring at the nipple. It seems that the baby is eager to see the mother's face, especially the mother's eyes, even if the nipple is very close to the lips. If the baby is in the middle of the mother's breast, where baby relaxes for some time before starting and remains calm alert, and appears as he is happy to see the mother's face. It is a very beautiful moment when the mother looks into the eyes of her baby and the baby also tries to see her. On the basis of these findings researcher hypothesized that, if the child can admire her mother's face, then of course he can also see the areola and nipple (baby distinguish a black mark in a light) Lllingworth (1987) stated that a newborn baby shows more interest in a black and white pattern than in a blank grey card. Perhaps that is the main reason why the areola is hyper pigmented.
- C. Taste:-**The child sucks his hands, so he knows the taste of amniotic fluid present on his hands. The baby is able to recognize the taste and smell of amniotic fluid. In a mother's nipple, some lipids are present with help of the baby is able to identify the taste. (Klaus and kennel 2001)
- D. Auditory:-**When the baby is in the uterus, he may be able to hear different voices, and he reacted to the sounds. Baby recognizes the mother's voice, it is seen that the voice of the mother gives a very audile signal in the amniotic atmosphere. Neonate and fetus, whenever they hear the sound of speaking, their heart rate starts to decrease. When the neonate hears the mother's voice, then he sucks louder and longer. The mother's voice naturally encourages the neonate. The ability to hear the baby's voice helps in starting the breast crawl.

E. Touch: Skin-to-skin touch enhances warmth and a lot of tactile activity in the newborn. The voice of the mother's heartbeat also helps the baby to calm down. It maintains body temperature. It helps to initiate breastfeeding immediately.

2. Motor output

- a) **Orofacial:-** Half an hour after birth, the baby starts moving the mouth as if tasting with lips and sucking hand, once the newborn attached to the breast he will continue breastfeeding for 20 minutes.
- b) **Lower limbs:-** Stepping reflex poses the baby forward and helps him to wiggle on the mother's belly. Head and foot move after 49 minutes.
- c) **Upper limbs:-** horizontal movements are achieved by using pushups and lowering one arm in the direction they wish to go. Muscular strength in the neck, shoulders, and arms helps newborns to bounce their head and do small pushups.
- d) **Salivation:** salivation occurs in anticipation that the food is in close proximity.

3. Neuro-endocrine component

After delivery in the mother's brain oxytocin hormone is secreted by the pituitary gland. It causes muscle contractions that will help to push out the newborn and to expel out the placenta. It is also known as a hormone involved in social relationships, bonding, trust, and love. When a baby's mouth feeds rhythmically and the heart and breathing rates are steady this –swallow-breath trio works in perfect harmony and baby-feeds. Metabolizes and sleeps with ease.

Benefits of Breast Crawl: Early initiation of breastfeeding can save neonates from death. There are various benefits for the baby as well as for the mothers. Some are listed here:-

I. For the newborn:-

Researches proved that if the newborn is given to the mother for skin-to-skin contact in the early hours of birth results in better body and skin temperature. It gives warmth and protects from hypothermia. Immediately after birth, if the newborn placed in contact with the mother's skin, it helps the baby to adjust from intrauterine life to extra uterine life. Studies prove that newborn is understood to e starts crying, Gets silent as soon as the baby adjusted to the environment. It is seen that cry is related to “separation distress call”. The babies who are not started breast crawl at birth are at greater risk for transient acidosis, as compared to the baby's started breast crawl just

after because it would help to keep head up and maintains blood sugar. It was also observed that if the baby gets continues to breast crawl for 1 hour that is more likely to have a good attachment as compared to the baby's get interrupted breast crawl only for 20 minutes. Baby's mouth should be properly attached to the breast for effective suckling.

II. For Mothers:-

Breast crawl build up the bond between mothers and baby this stimulates the release of oxytocin and this will help to contract the uterus, the expulsion of the placenta, and closing of many blood vessels in the uterus. It will also reduce blood loss and prevent anemia.(When the baby crawls on the mother's abdomen, it will increase the uterine contractions; it will also promote the secretion of oxytocin which will help in the release of the placenta and closes blood vessels). Moreover crawls improve good attachment and if the baby will suck properly, there may be no chance of any nipple pain and breast engorgement. When the baby is kept on a mother's abdomen there is an increased amount of oxytocin which will also be known as the love hormone. Eye contact between mother and baby will help to generate a good bonding between mother and baby.

Stages of breast crawl:-there are nine stages of breast crawl given by BFHI and UNICEF newborn baby go through nine distinct stages after birth within the first hour or so:-

- 1) **Birth Cry:** intense crying just after birth.
- 2) **Relaxation Phase:** -infant resting and recovering no activity of mouth, head, arms, and legs or body.
- 3) **Awakening Phase:** - infant begins to show signs of activity, small thrusts of head: up, down, from side to side small movements of limbs and shoulders.
- 4) **Active Phase:** - infant moves limbs and head is more determined in movements, rooting activity, pushing with limbs without shifting body.
- 5) **Crawling Phase:** -pushing which result in shifting body.
- 6) **Resting Phase:**-infant rests, with some activity such as mouth activity, suck on hand.
- 7) **Familiarization:** -infant has reached areola /nipple with mouth positioned to brush and licks areola/ nipple.
- 8) **Sucking Phase:** -infant has taken a nipple in the mouth and commences sucking.
- 9) **Sleeping Phase:** - the baby has closed his/her eyes; the mother may also fall asleep.

Dos and don'ts for success of breast crawl:-**For the mother:-**

- Use drugs for labor analgesia judiciously.
- Do not wash/ wipe your breast before feeding.
- Raise mother's head on a pillow to facilitate mother-baby visual contact.
- Do not move mother out of labor room until completion of the first breastfeed.

For the baby:-

- A baby who has cried well does not need oro-nasal suction.
- Dry the baby thoroughly except for the hands.
- Do not pass orogastric/ nasogastric tube or do gastric suction as a routine.
- The baby and the mother should be covered together with a cloth so that they keep warm while continuing with skin-to-skin contact.
- Delay the injection of vitamin K, weighing, routine measuring, and wrapping till after the first breastfeed.
- A baby bath is bestly delayed to be 24 hours.
- Continue the first skin-to-skin contact till the completion of the first breastfeeding.

Conclusion:-Early skin-to-skin contact and the opportunity to suckle within the first hour or so after birth are both important. However, contact and suckling are so closely interrelated the infant should be left with the mother continuously from birth, and allowed to attach spontaneously to the breast whenever she shows signs of readiness to do so. Researches proved that if the newborn is given to the mother for skin-to-skin contact in the early hours of birth results in better body and skin temperature. It gives warmth and protects from hypothermia. Immediately after birth, if the newborn placed in contact with the mother's skin, it helps the baby to adjust from intrauterine life to extra uterine life. Whereas for mothers, breast crawl build up the bond between mothers and baby this stimulates the release of oxytocin and this will help to contract the uterus, the expulsion of the placenta, and closing of many blood vessels in the uterus. It will also reduce blood loss and prevent anemia. An practical minimum recommendation is for skin-to-skin contact to start within at most half-an-hour of birth and to continue for at least 30 minutes.

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Aerodynamic Simulation Effects on different parameters of Vertical Axis Wind Turbine systems: A Review

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ABSTRACT:-In this study of VAWT various design parameters and its effect on performance and power generation capacity has been analyzed. Various design configurations has been considered and measured in terms of their performance improvement capacity is measured. Like side by side placement of turbine, curved-outline wind gathering device for wind, start-up process effect, offshore or floating turbine, application of actuator cylinder, fluid interaction with turbine, rotational speed, flow-deflecting-gap blade etc and their impacts were studied.

Keywords: VAWT, Aerodynamics, CFD.

1. INTRODUCTION:-As a renewable and widely distributed clean energy resource, wind energy has attracted attention in the past decade because of its potential use in the power generation [1]. Based on the direction of rotation, it can be divided into two types: vertical axis wind turbine and horizontal axis wind turbine. Since the beginning of the research in the field of wind turbine horizontal axis wind turbine was investigated for its development and now commercialised with high utilization rate. But, HAWT is having some objection, first steering device need to maximize the swept area, which leads design of complicated structure; second blade root under high speed rotation intent to fatigue failure, results in high maintenance cost. VAWT overcomes above problems and perform better in turbulent flow field. But the drawback includes the complex flow field structure, low efficiency and construction difficulty of large scale turbine putting challenges to the popularity of VAWT. Presently, it is limited to small scale equipment to generate small amount of power supply and experimental study.

2. a. TWO TURBINES PLACED SIDE-BY-SIDE:-The twin vertical-axis wind turbine (VAWT) system is a high-performance design in which two turbines are placed side by side with a variable gap distance [1]. In this paper, the large eddy simulation and the sliding mesh technique are employed to numerically study the aerodynamic performance of the dual-rotor configuration. First, the reliability of this CFD model is validated, including computational stability analysis, time-step dependency study, and grid convergence verification. The turbine power coefficients under different tip speed ratios are calculated and results exhibit a satisfactory agreement with the available experimental data. Then, the wind energy utilization of side-by-side placed twin VAWTs under different gap ratios and various azimuth angle shifts are investigated, respectively. The results reveal that compared with two isolated turbines, the power coefficient of a twin-turbine system has a significant enhancement. Moreover, the paper analyzes the mechanism for obtaining gains. In regard to the study of azimuth angle shifts between two adjacent turbines, this paper demonstrates that the blade azimuth angles of twin VAWTs do not need to be synchronized. The azimuth angle shift has little effect on the aerodynamic performance of the twin-turbine system.

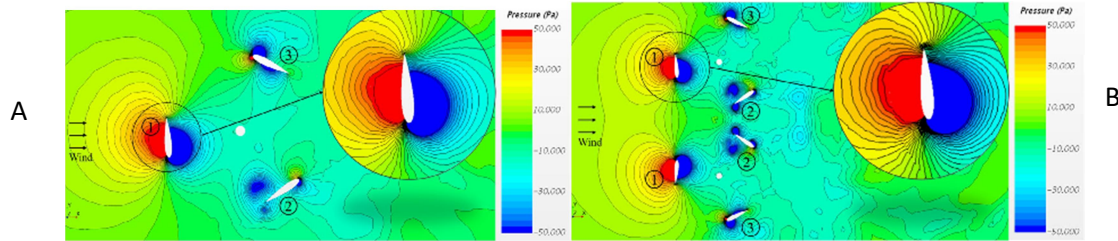


Fig.1(A) Pressure contour of Isolated Turbine(B) Twin-turbine system L/D ratio 1.2

2.b. SBVAWT CURVED-OUTLINE WIND GATHERING DEVICE

To improve the dynamic performance wind gathering device (WGD) is used in the SBVAWT on the upper and lower side of the rotor to extract more energy [2]. B- Spline curved was used to draw the characteristics of WGD. Structure parameters of the WGD; radius ratio of the upper and lower plan, inlet angle and the outlet angle. Firstly, based on quadratic rotary orthogonal combination design, the static performance effects of these parameters of WGD on SB-VAWT were researched by three-dimensional numerical simulation and combination of optimum curve parameters was obtained. WGD's influence with various structure parameters on starting characteristics of rotor. Hence forth, the wind tunnel tests were carried out on rotor with and without WGD. The results showed that both the static and dynamic performance of SB-VAWT was increased in some degree by adding the WGD. The maximum starting moment of SB-VAWT could be increased by 14.8%. This research can be useful for the performance improving of SB-VAWT.

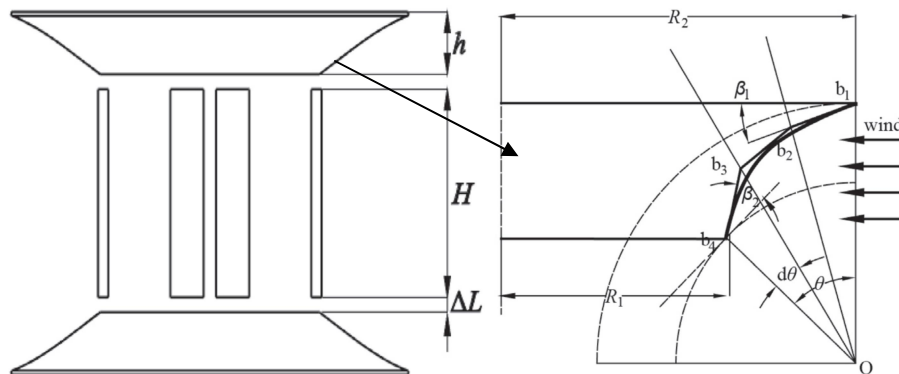


Fig.2. Vertical axis wind turbine with curved-outline WGD set up and down of rotor.

3. a. START-UP PROCESS OF H-TYPE VAWT

CFD start-up model has been built after conducting the sensitivity studies to evaluate the self-starting behaviour of the H-type vertical axis wind turbines (VAWTs) [3]. The self-starting behaviour is used for the model validation, and the details of aerodynamics of the start-up process have been examined. Finally, the effect of the moment of inertia and the blade number on the aerodynamic behaviour of the self-starting and power performance analysed. Critical region, where $TSR < 1$, drag contribution to torque generation plays a significant role in the second and third quarters of the rotor revolution, where the azimuthal position varies between 100° and 253° . Results show that increasing the turbine inertia did not show a noticeable effect on the start-up behaviour of the turbine and final rotational speed. The current findings also show that an increase in the blade number makes the turbine easier to start-up; but, reduce the turbine power coefficient.

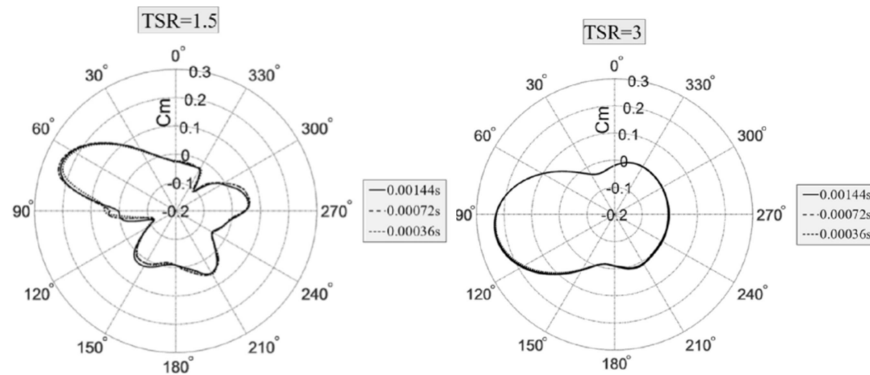


Fig.3. The moment coefficient as a function of azimuthal angle for the time step size study at TSR = 1.5 and TSR = 3.

3. b FLOATING VERTICAL AXIS WIND TURBINES ACTUATOR CYLINDER

Among the aerodynamic models of VAWT, double multiple stream tube (DMST) and actuator cylinder (AC) models are the favorable methods for fully coupled modeling and dynamic analysis of floating VAWTs in view of accuracy and computational cost [4]. Development of aerodynamic code floating VAWTs using the AC method developed and includes the tangential load term when calculating induced velocities, addresses two different approaches to calculate the normal and tangential loads acting on the rotor, and proposes a new modified linear solution to correct the linear solution. Effect of dynamic stall is considered, developed code is verified to be accurate, numerical models and experimental results. Including the tangential load term when calculating, induced velocities on aerodynamic loads is very small. The proposed new modified linear solution can improve the power performance compared with the experiment data.

4.a. FLUID-STRUCTURE INTERACTION VAWT

Full-scale, 3D, time-dependent aerodynamics and fluid-structure interaction (FSI) simulations of a Darrieus-type vertical-axis wind turbine (VAWT) are presented [5]. A structural model of the Wind-spire VAWT is developed, shell and beam/cable formulations. A moving-domain finite-element-based ALE-VMS (arbitrary Lagrangian-Eulerian-variational-multiscale) formulation is employed for the aerodynamics in combination with the sliding-interface formulation. The sliding-interface formulation is augmented to handle non stationary cylindrical sliding interfaces, which are needed for the FSI modeling of VAWTs. The computational results presented show good agreement with the field-test data and transient VAWT response and the issues related to self-starting.

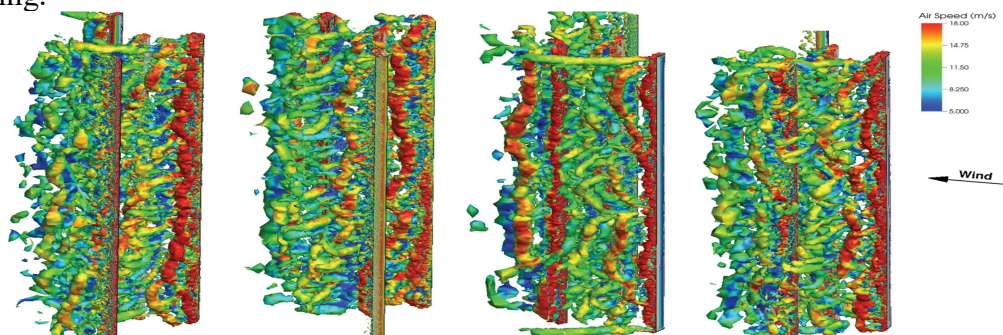


Fig.4. Vorticity is o surfaces of vorticity colored by velocity magnitude for the 4 rad /s case. Zoom on the rotor. From left to right: vorticity at 1.12 s, 1.24 s, 1.40 s, and 1.50 s.

4.b. VAWT IMPROVED DELAYED DETACHED EDDY SIMULATION

The results of the aerodynamic and aeroacoustic assessment for a vertical axis wind turbine (VAWT) [6]. The Improved Delayed Detached Eddy Simulation (IDDES) technique and Ffowcs Williams and Hawkings (FW-H) acoustic analogy method are adopted to simulate instantaneous flow field and to perform the noise prediction in the far field. The CFD model is verified against available experimental data for the power coefficient. The acoustic pressure spectra of thickness, loading, and quadrupole noise are presented, and the mechanisms and contributions of different noise are discussed. The effects of increasing rotational speed, receiver distance and turbulence intensity are studied. The results indicate that the thickness and loading noises are the dominant noise sources, while the influence of quadrupole noise is not negligible when the Mach number increases. Higher tip speed ratio and increased loads on blades will generate larger thickness and loading noise. In addition to the changes in lift and drag forces, higher turbulence intensity will make stronger interaction between vortex structures and blades, thereby induces a higher level of noise

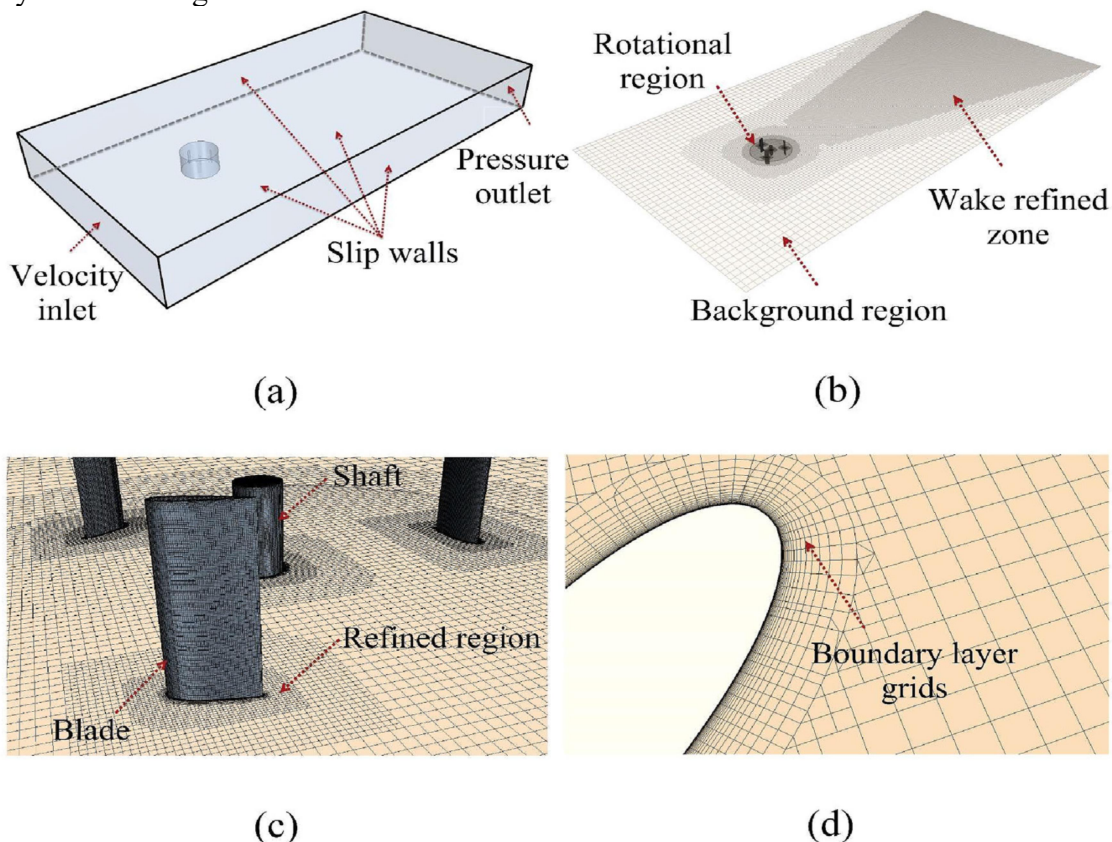


Fig.5. (a) Computational model; (b) A cross section of the computational domain;
 (c) Mesh topology around the blade; (d) Boundary layer grids.

5.a. VAWT WITH BOUNDARY LAYER SUCTION

Vertical axis wind turbine (VAWT) has become a research hotspot because of its structural advantages and omni-direction capability [7]. While a further performance improvement is needed for its lower power coefficient and complex flow on blades for VAWT. Boundary layer suction (BLS) as an effective separation control method for airfoil can be a potential way to enhance the performance of VAWT. The current study first investigates boundary layer suction momentum on NACA0021 airfoil by numerical simulation. Suction momentums from 0.001 to 0.4 are investigated systematically using steady simulation with SST $k-\epsilon$ turbulence model.

Three zones are concluded by the corrected lift-drag ratio with suction momentum. The corrected lift-drag ratio can be increased to more than 8-14 times higher. The percentage increase in power coefficient for BLS applied on VAWT can reach to about 34.25% at the optimal tip speed ratio (TSR) for boundary layer suction VAWT at $TSR = 2.33$ for $C_{\mu} = 0.0075$.

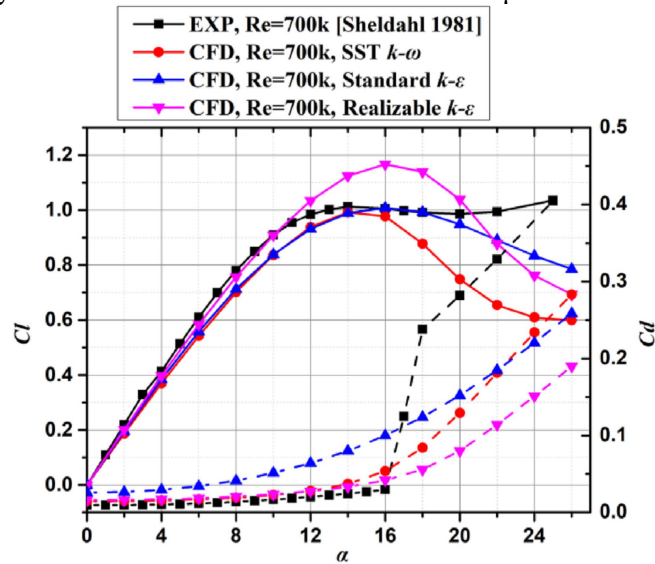


Fig.6. Simulation validation of lift and drag coefficient by various turbulence models (solid lines: lift coefficient, dash lines: drag coefficient).

5.b. INFLUENCE OF ROTATIONAL SPEED ON AERODYN. PERFORMANCE

A two dimensional vertical axis wind turbines model was established and two dimensional unsteady incompressible N-S equations and Realizable $k-\epsilon$ turbulence model were solved with software FLUENT [8]. SIMPLC algorithm was applied, combined with the sliding grid technology; the influence of rotational speed to the flow structure of vertical axis wind turbine was discussed. The wake velocity restored gradually away from the rotational part. There was much larger turbulent kinetic energy near the tail of the wind turbines blade. The value of turbulent kinetic energy reduced gradually away from the rotational part, and the flow restored the stratospheric state gradually. The results showed that the flow structure of vertical axis wind turbines rotational process could be revealed effectively by numerical simulation, provided theoretical reference for the engineering design of the vertical axis wind turbine.



Fig.7. distribution of turbulent kinetic energy (m^2/s^2)

5. C.IMPACT OF OPERATIONAL PARAMETERS

Vertical axis wind turbines (VAWTs) have received growing interest for off-shore application and in the urban environments mainly due to their omni-directional capability, scalability, robustness, low noise and costs [9]. However, their aerodynamic performance is still not comparable with their horizontal axis counterparts. To enhance their performance, the impact of operational parameters such as tip speed ratio (λ), Reynolds number (Re_c) and turbulence intensity (TI) on their power performance and aerodynamics needs to be deeply understood. The

current study, therefore, intends to systematically investigate the effect of these parameters in order to provide a deeper insight into their impact on the aerodynamic performance of VAWTs. For this investigation, a Darrieus H-type VAWT has been employed. High-fidelity computational fluid dynamics (CFD), extensively validated with experimental data, are employed. The results show that (i) variable-speed operation maintaining the optimal λ at different wind speeds improves the turbine power coefficient, e.g. up to 168% at 4 m/s, while keeping an almost constant thrust coefficient, (ii) the turbine performance and wake are Re-dependent up to the highest Rec studied, (iii) large TI ($> 5\%$) improves the turbine performance in dynamic stall by promoting the laminar-to-turbulent transition and delaying stall on blades, however it deteriorates the optimal performance by introducing extra skin friction drag.

5.d. EFFECT OF FLOW-DEFLECTING-GAP BLADE

In order to improve stall characteristics more effectively or eliminate dynamic stall in a revolution of vertical axis wind turbine, three kinds of novel flow-deflecting-gap (FDG) blade were designed and investigated numerically, including two-side FDG blade, toward-outside FDG blade and toward-inside FDG blade [10]. Firstly, the aerodynamic characteristics of isolated flow-deflecting-gap blade were obtained and its effect was illustrated. Then, the investigation on aerodynamic characteristic of novel SB-VAWT was conducted. The obtained results indicated that compared to clean airfoil, FDG enhances the stalling angle of attack (AOA) by 2° and increases lift-drag ratio at high AOA. For a vertical axis wind turbine, toward-inside FDG can efficiently decrease the optimal tip-speed ratio and improve the aerodynamic performance at low tip-speed ratio. Additionally, an increase of 10.21% of torque coefficient is caused by toward-inside FDG. The central shaft is an inseparable part of a vertical axis wind turbine (VAWT) [11]. For small turbines such as those typically used in urban environments, the shaft could operate in the subcritical regime, resulting in large drag and considerable aerodynamic power loss. The current study aims to (i) quantify the turbine power loss due to the presence of the shaft for different shaft-to-turbine diameter ratios δ from 0 to 16%, (ii) investigate the impact of different operational and geometrical parameters on the quantified power loss and (iii) evaluate the impact of the addition of surface roughness on turbine performance improvement. A maximum power loss of 5.5% compared to the hypothetical case without shaft is observed for $\delta=16\%$. For an optimal dimensionless equivalent sand-grain roughness height of 0.08, the turbine power coefficient at $\delta=4\%$ improves by 1.7%, which is equivalent to a 69% recovery of the corresponding turbine power loss. In this paper, a new type of blade model driven by single input for vertical axis wind turbine was developed, and it could achieve synchronous active deformation for both of blade leading edge and trailing edge [12]. Firstly, by taking the concept of ribs and by taking NACA0012 airfoil as an example, the mechanical structure and skin with adhesion mechanism of pre-tightening force was adopted based on the continuous deflection and deformation mode of the blade leading and trailing edges with constant thickness. Secondly, the experimental platform for measurement of wind tunnel force and flow visualization was built up, where the smoke wire instrument, seven-hole probe, two-component balance were applied for measuring of quasi steady force and flow visualization under different deformation quantities. When exceeding the critical camber, the friction resistance becomes a dominant factor effecting blade aerodynamic performance.

6. CONCLUSIONS:-Above study has given good idea for the development of new turbine and their performance improvement of VAWT by applying different methods, different design parameters and configurations used for the performance improvement and power generation coefficient of floating as well as offshore turbine. Various factors as mentioned above has been

applied and their effects were studied and optimum value of factors has been tried to found out. A graphical result shows the actual visual explanation of various results. Furthermore, this study was helpful to understand the overall things as well as about H-rotor vertical axis wind turbine.

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Assessment of Pesticide residue in stored grain and Bat faces in Shekhawati Region of Rajasthan.

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Abstract:-IPM is the future of farming. It not only reduces the pesticide residue in crops which are to be consumed by humans level can also open the gates for international market for residue free IPM produces. Thus bringing financial prosperity to the farmers of Rajasthan. With the increase in diseases like cancer, pesticide poisoning etc. in young generation, IPM provides foolproof solution. Many big players have already paired with farmers to produce IPM cumin for both Indian and International markets. IPM is an efficient and environmentally focused method to effectively control the pest. IPM doesn't completely rule out the use of pesticides but emphasizes on the judicious use of them The aim of IPM is to cause least damage to people, agricultural fields and the whole environment. Rajasthan is the biggest state area wise in India. Most of its land is barren due to the prevailing arid conditions. Around 20 Lack hectare land is available for cultivation. A big example of successful IPM practices in Rajasthan is SIFS (Sustainable Integrated forming system) in southern Rajasthan's Aravali Mountain Ranges. IPM is much more approachable and efficient method then earlier. The farmers are not reluctant to use pesticides on their crops having known the harmful effects and more importantly IPM is helping farmers fetch more money thus bringing financial stability to them.

Introduction:-IPM usually has a four tiered approach.

- 1st step is to determine an action threshold where the pest control must be done. A particular level of pests has to be present on the crops for the effectiveness of IPM.
- 2nd step is monitoring the pests. All the insects present on the crops are not pests so the particular harmful pest has to be identified so that cured pesticide can be used.
- 3rd step is the prevention of the pests from becoming a potentially damaging threat for this may cultural methods come into play like rotation of crops, sourcing resistant varieties etc.
- The last step is control. This uses a range of methods which are both efficient and cost effective, causing no or very less damage to the ecosystem. Examples of such methods include use of pheromones, trapping the pest using lamps, if these methods are not found to

the controlling the pest populations then targeted pesticides and be used. The use of wood spectrum pesticide is considered the last solution in IPM.

Impact of IPM has been validated in some cases like a case of Banswara Dist. The study was done on 50Ha land in Kharif crop season of 2001 & 2002. It was seen that the IPM reduced the population of Aphids, Whitefly, Thrips and bollworms. The positive outcome was the increase in populations of *Coecineellids* and *Chrysoper lacarnea* and other spades. They are the beneficial insects and cause no harm to the crop. Thus the insect biodiversity of the area was conserved.

Another study shows the impact of pesticides used in vegetable crops on the health of consumers. The study was focused on two district of Rajasthan namely, Sri Ganganagar and Jaipur. The data was collected during 2015-2016 with a very low average botanical pesticide usage. The frequency of spray of the chemical insecticides was also very frequent ranging from 11-22 sprays in different crops. The study concluded that due to improper use of pesticides, lack of safety tools and no proper training among farmers was responsible for chronic diseases. This study also highlighted the reduction in the number of insect pollinators and bees after the spray of pesticides. Thus it can be concluded that IPM can pave the way for a sustainable crop production causing waste damage to with the health and biodiversity of the ecosystem.

Statistical Database of Consumption of Pesticides in Rajasthan:-If we look at the recent trends in India for the consumption of chemicals in units of MT Tech. Grade, it is found that in year 2016-17 a grand total of 58634 chemicals, year 2017-18 total of 63406, 2018-19 total of 59670, year 2019-20 a total of 61702 and finally in year 2020-2021 a total of 62193 chemicals were consumed. Out of these chemical consumed Rajasthan state reported consumption of 2269 in year 2016-17, 2307 in year 2017-18, 2290 in year 2018-19, 2088 in year 2019-20 and 2330 in year 2020-21. So it can be interpreted from the data that the consumption of chemicals in Rajasthan is more or less in the range of 2200-2300 MT Tech. Grade. This shows that the crop produce in the state is highly dependent on the chemicals. The dependence of chemicals has to be reduced to lower the pesticide load on the environment. IPM can provide an effective solution in such situation.

Methods:-For this study two categories of samples were collected. One category was the sample of infested stored grain and other category was the bat faeces sample. The analysis was done using HPLC and mass spectrophotometer.

The major chemicals found in two samples are given below-

SAMPLE 1- Bajra stored grain

SAMPLE 2- Wheat stored grain

	SAMPLE 1	SAMPLE 2
Allethrin($\mu\text{g}/\text{kg}$)	BLQ	BLQ
Butachlor($\mu\text{g}/\text{kg}$)	63.2	63.8
Chlorpyrifos($\mu\text{g}/\text{kg}$)	56.21	56.1
Esfenvalerate($\mu\text{g}/\text{kg}$)	36.25	36.5
Flucythrinate($\mu\text{g}/\text{kg}$)	39.25	38.9
OP-DDE($\mu\text{g}/\text{kg}$)	41.02	41.0
Phorate($\mu\text{g}/\text{kg}$)	50.21	50.32
Diuron($\mu\text{g}/\text{kg}$)	BLQ	BLQ
Prothioconazole($\mu\text{g}/\text{kg}$)	26.02	26.05

LOQ:10 $\mu\text{g}/\text{kg}$

BLQ means $5 \leq 10 \mu\text{g}/\text{kg}$

SAMPLE A and SAMPLE E are bat faeces collected from different sites in Shekhawati region.

	SAMPLE A	SAMPLE E
Allethrin($\mu\text{g}/\text{kg}$)	BLQ	BLQ
Butachlor($\mu\text{g}/\text{kg}$)	BLQ	BLQ
Chlorpyrifos($\mu\text{g}/\text{kg}$)	11.2	11.3
Esfenvalerate($\mu\text{g}/\text{kg}$)	BLQ	BLQ
Flucythrinate($\mu\text{g}/\text{kg}$)	BLQ	BLQ
OP-DDE($\mu\text{g}/\text{kg}$)	BLQ	BLQ
Phorate($\mu\text{g}/\text{kg}$)	BLQ	BLQ
Diuron($\mu\text{g}/\text{kg}$)	BLQ	BLQ
Prothioconazole($\mu\text{g}/\text{kg}$)	ND	ND

LOQ:10 $\mu\text{g}/\text{kg}$

BLQ means $5 \leq 10 \mu\text{g}/\text{kg}$

Discussion:-The analysis of samples suggest the presence of pesticides in both the food grain sample and the bat faeces sample. Some of the major chemicals found are discussed below-

Butachlor has a role as a herbicide, an environmental contaminant and a xenobiotic. It may cause an allergic skin reaction, Toxic if inhaled, Very toxic to aquatic life with long lasting effects.

Chlorpyrifos is used to control many different kinds of pests, including termites, mosquitoes, and roundworms. It affects the nervous system. Researchers studied the blood of women who were exposed to chlorpyrifos and the blood of their children from birth for three years. Children who had chlorpyrifos in their blood had more developmental delays and disorders than children who did not have chlorpyrifos in their blood. Exposed children also had more attention deficit disorders and hyperactivity disorders.

Esfenvalerate is a pyrethroid insecticide registered as aerosols for space treatments inside mills, processing facilities, and food warehouses. The compound may produce nausea, vomiting, headache, temporary nervous system effects such as weakness, tremors, and incoordination at acute exposure levels in humans. Esfenvalerate is a strong eye irritant, producing tearing or blurring of vision.

Flucythrinate can cause hair loss, scabbing, and open lesions.

Di chlorodi phenyl di chloro ethylene (DDE) is found in breast milk of mothers. It leads to bioaccumulation.

Phorate is highly toxic. Bans for some of this pesticide have now been announced by the Central Government in 2020.

DCMU (3-(3,4-dichlorophenyl)-1,1-dimethylurea) is toxic for aquatic species.

Prothioconazole is a broad-spectrum systemic fungicide used for the control of diseases caused by ascomycetes, basidiomycetes, and deuteromycetes.

Conclusion:-All these chemicals that are found in the research work have shown effects on the biological life systems. Some are chronic and others are showing acute effects. More research has to be conducted to analyze the effect and chronicity on both the flora and fauna of the Shekhawati region. With the study it can be concluded that there is a lot of insecticide and pesticide residues in the ecological system of this area and this has to be closely monitored. More laboratory work and chemical analysis has to be done to find the accurate results. But one thing is for sure that IPM can only reduce the pesticide load on this area of Rajasthan.

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Appraising information seeking behaviour of students during the Covid-19 pandemic

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Abstract:-The Covid-19 pandemic has proved to be an unforeseen event which has affected the lives of the people all over the world and will probably the scenario will remain the same for a couple of years, that is what the experts claim. The doors of various educational institutions are temporarily shut all over the world for the student community. The traditional sources of information have mostly been print media and mass media and in the recent years online sources had started making their presence felt as a substitute to the traditional mediums, however because of the current pandemic situation, the internet has been the most used source with no much sources available and use of print media has almost stopped. The study will deal with the information needs, availability of information, information seeking behaviour and the use of information sources by the students. In this study it is predicted that the students feel lost at times in the online information world. They do not understand the techniques to retrieve the information from the most authentic source of information. The COVID-19 outbreak has had a significant impact on the daily lives of those who live in affected areas post-covid, as well as on society as a whole. It is found that some students have been facing certain barriers to access the electronic resources. The internet connection is the primary issue to use the electronic resources systematically. The time required to access the electronic resources is more due to the poor broadband. There is a need to increase the capacity of the broadband.

Key Words:- COVID-19, Learning, Information, Mass media, Electronic resources

I. Introduction:-Information seeking behaviour was initially associated with computer access, computer training, internet admittance and rate of use. A complete set is truly required to build the capacity of care providers on computer-related skills in today's times. The print media transmits information through physical media such as books, magazines, journal, reports, newspapers or pamphlets etc. The best collective stages for mass media are newspapers,

magazines, radio, television and the internet. Mass media refers to a diverse range of media technologies that reach a large audience via mass communication. Digital media includes both, the internet as well as mass communication. Internet media comprises services such as email, social media sites, websites, and Internet-based radio and television. The online information resources are electronic resources that contain data and programs. The databases comprise of special kind of material like store or controlled resources. Online information resources are the common form of electronic resources. The electronic resources help store information electronically, which can be accessed with the help of network environment and electronic system. The electronic resources are in different formats like online journals, website information, online newspapers, electronic books, online magazines, online archives, online thesis etc. The information communication technology has been changed over the years. Information hubs, databases and web technologies change the creation, manage, acquiring and dissemination of information and knowledge to students. The Open access resources offer a chance to admittance full text resources from anywhere and at no cost involves to accessing these resources. These resources may be repositories, journals, magazines, e-books and databases on diverse disciplines. In order to get access to certain information resources, the user requires some authentication or login; it is also known as subscribed resources. However information seeking behaviour of students during Covid-19 pandemic has been truly affected all over the world due to various factors.

II. Review of Literature

Oh et al., (2020) showed that perceived personal risk of contracting Middle East respiratory syndrome was related to risk information consumption on social media and motivated preventive behaviours.

Fung et al., (2018) Uncertainty was measured by asking respondents to indicate their level of uncertainty when judging their risk susceptibility. Although considering uncertainty as a metacognition for risk perceptions is not entirely novel, explicitly stating this in its definition is useful for theorizing its relationship with risk perceptions and investigating how they influence risk information seeking together.

Janssen et al., (2018) considered uncertainty in terms of "don't know" responses to risk perception questions; this however, implied that individuals do not experience uncertainty if they can indicate a risk judgment. A theorization is required not only to clarify the conceptual distinction between risk perceptions and uncertainty, but also to allow for the study of the two in tandem.

Fung et al., (2018) the extended RISP proposed a chain of events in which risk perceptions lead to emotional appraisals, which in turn trigger uncertainty and influence information seeking.

Luttrell et al., (2016) the metacognitive confidence in a risk experience is highlighted by risk uncertainty. It is a self-reflection on how certain people feel about risk judgments. It denotes the polar opposite of certainty, perceived correctness, or firmness.

III. Methodology:-The data is collected through systematically planned open ended questionnaire. The researcher selected 100 students across the Goa State. The questionnaires were distributed among the students to get the correct and authentic data which will improve the quality of research.

Goa is the smallest state of Indian Union, on the West coast of India located between Sahyadri Mountain range on the east and Arabian Sea on the west. Goa was constituted as the 25th state of Indian Union on 30th May 1987 with a total land area of 3,702 sq. kms. In 1961, Goa was liberated from the clutches of the Portuguese, since then Goa has seen an impressive progress in the field of education. The state had achieved 82% literacy in the year 2001 and at present, it has literacy rate of about 89%. Konkani is the official language of Goa. The Goa Government considers education as the foundation for Human Development.

Goa presents an ideal tourism profile, which is identified as a major industry followed by the mining industry. The total population of Goa is around 1.5 million and attracts almost six million tourists every year. It has a colourful history, its scenic beauty; culture and social ethos are something that fascinates the tourist. It is a tiny paradise with the loveliest beaches, temple, churches with historical monuments and fantastic kaleidoscope of unparalleled beauty.

IV. Objectives of the Study

1. To investigate the information requirement of the user.

2. To observe the behaviour of students while searching the information.

V. Findings and Conclusions:

1. Availability of online information resources to the students is primarily important to the all educational institutions. To use the online information resources, A sort of endorsement and admission procedures are required to subscribe the online information resources. Some students even access the sources through their friends' login account. The students share personal login detail to others for resource sharing. It is the prime responsibility of the institution to provide the access to their online resources to the students and faculty members. The Students want online information resources for their academic purpose. The study shows that due to the covid -19 pandemic the use of Online Information Resources is speedily common among students, researchers and faculties.

2. Major problem of approachability of online information assets is the internet; many students face the internet connectivity issues, and some lack skills and equipments to access their required data.

3. The selection of the required information is the main task with the students since the data is vast and to retrieve the required information from this vast data requires skills. The study shows that the students need to be trained to use these electronic resources, different platforms are available for the students to access the required information; however a skill is must to retrieve the required information. Rather than copying everything from the available sources, the information seeker must be sharp enough to select, the content and information for his/her use, and that can come only with practice and regular use.

4. In this study it is pointed out that more than 80 percent of the students get busy in finding the required information, but a lot of time is wasted in searching the information, so it is revealed that the proper time planning is a must.

5. The most important problem faced by the students in this online searching of the information is the network issues. The proper network is not available to most of the students. To overcome this problem there should be increased in the band width connectivity.

6. To access electronic resources most of the students use their electronic gadgets such as smartphones, laptops, tabs and desktop etc. the study shows that more than 86 percent students are more comfortable with their smartphone rather than laptop and desktop. It is because of the easy internet connection to the smartphones, that students prefer them. It is also faster than the other electronic gadgets. It is easy to handle and carry the smartphones without any problem, anywhere.

7. The result of the research shows that the social media is not the proper media to obtain the authentic data. It is suggested that social media should not be used to collect the data for the academic purpose. The social media may be only used to pass the messages about the academic calendar.

8. The study shows that it is very necessary for the students to gain the knowledge to access the electronic resources from the librarians and teachers. They will guide the students in the proper direction. So it is advisable to the students to be in touch with the them.

VI. Limitations of the Study:

- i. Since the study is conducted using small groups of the student-community, their opinions on the information seeking behaviour of students should not be generalised.
- ii. The data is collected from the students of the Goa State.

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Conflict of Interest

The author certifies that the study was conducted purely for the academic purpose and not for the financial interest.

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A SURVEY ON BIOMEDICAL DATA WITH PREDICTIVE DATA MINING AND DATA PROCESSING

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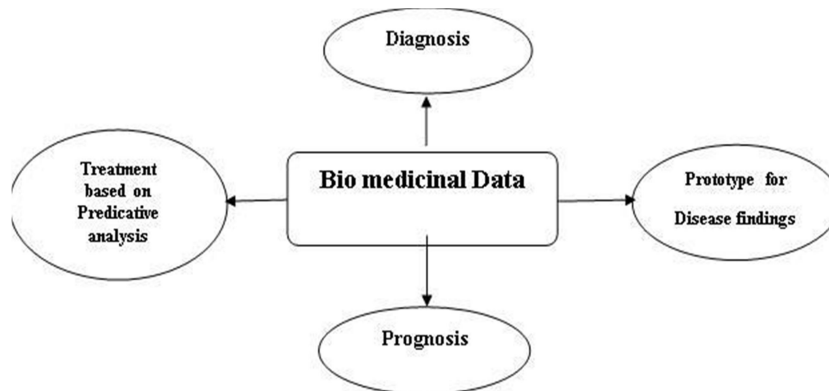
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Abstract: - Data processing is an academic degree rising range of machine intelligence that gives novel concepts, methods as well as tools for method large volumes of knowledge. The foremost emphasis of this work is to enlarge sympathetic of ecologists, medicinal experts and researchers would have the good thing about processing and statistical methods in cancer survivability using prediction and prognosis. Victimization of R statistical computing tool and machine learning tools. During this document we tend to state prediction analysis and relative study of the knowledge mining and machine learning techniques. Machine learning and processing techniques have established to be wonderful tools for data extraction in clinical and genomic data has become an extremely necessary topic in analysis. Brobdingnagian tries are being created by laptop experts and mathematicians to vogue as well as algorithms implications, practices for economical storage, management, processing, and analysis of Medical data.

Keywords: classification, clustering, Data mining, cancer, predictive analysis

INTRODUCTION- The biological datasets are helpful for locating machine learning data system and biological information system were accustomed the prediction degree of every element and relative studies of the algorithms were completed therefore on draw the optimum classification model. Algorithms for classification are the foremost shared processing and implications of algorithms used for machine learning techniques, mostly used for data analysis in every trade as well as domain. This paper introduces a complete knowledge implication of Statistical learning, data mining, and machine learning algorithms, such as AdaBoost, Support vector machines (SVM), Random Forest, Bagging and Boosting, call Trees, Artificial Neural Networks (ANN), Principal Component Analysis (PCA) and theorem-based classifiers were examined. The great development of the quantity of bio medicinal data increases a couple of problems: on first side economical information storage and management and on second side, the removal of suitable data from this information. The another downside is nothing but the foremost trials in machine learning for bio-medicinal data that desires an event of effective machine learning tool which is the disadvantage was presented throughout this study. The soul hopes this study would improve the prediction of malignancy in disease survivability and prognosis practice information and Statistical learning techniques and aiding medical scientists and physicians inside the method of cancer prognosis. KDD and data processing have found diverse applications in business and scientific domain. Valuable knowledge will be discovered from the knowledge mining techniques in care system. Throughout the learning, we tends for a shortly inspecting the possible usage of classification based mostly data processing techniques like rule based, called tree ,Naïve bays and artificial Neural network to huge volume of care knowledge. Clustering could be a method of separating dataset into subgroups consistent with their distinctive options.

A cluster could be a assortment of knowledge objects that are almost like each other among an equivalent cluster those are different to the items in other clusters. Whereas K-means algorithm will work on quantity of clusters required in recognized form. Therefore, associate formula is employed on similar or diss instances with clusters till associations stabilize around K-clusters.



LITERATURE SERVEY

The final discussion shows that previous work differs from the work exhausted this paper and can build a major contribution to the body of literature associated with data processing and applied mathematics learning techniques approaches to prediction of carcinoma survivability. Obeshain, (2004). "Using the info mining classification and applied mathematics learning techniques on carcinoma datasets, the medical practitioners will predict or accurately diagnose patients with carcinoma effectively and predict breast cancer survivability. The info community features a tendency to look at data processing techniques as additional sophisticated varieties of database queries (Obeshain, 2004).Data mining encompasses a large style of analytical techniques and ways, and data processing tools replicate this diversity (Han & Kamber, 2006; Kleissner, 1998; Obeshain, 2004).Data mining and applied mathematics learning is currently seeing broad use in a very wide range of fields, for instance, in search engines, personalized assistants, web bots, pc games, and scientific applications (Congdon, 2000).Data mining access of info differs from this ancient question access in many ways in which. Data processing will be enforced in a very massive dataset in fourteen machine-driven matter and generate an efficient result comparison to a conventional question. The choice tree algorithmic rule is that the hottest algorithm in data processing classification technique as a result of its straightforward to grasp however it makes predictions (Kleissner, 1998). Because of its simplicity and simple to implement, data processing classification or supervised algorithmic rule is that the most acquainted and hottest data mining techniques. SVM is extremely correct because of their capability to classify complex nonlinear call boundaries, less susceptible to drawback, however in keeping with Han & Kamber (2006), SVM is extremely slow comparison to different classification algorithms .Most call tree algorithms are supported a greedy approach, that was delineated within the below generic call tree algorithmic rule in figure one (Sattler & Dunemann, 2001).Ng, Liu & Kwah (1998) used call tree and applied mathematics deviation analysis to predict client attrition at Port of Singapore Authority and therefore the result was ninety nine.1% accuracy. within the tree-growing section the algorithmic rule starts with the entire knowledge set at the foundation node (Sattler & Dunemann, 2001).This procedure is recurrent recursively for every set till each subset contains solely members happiness to identical category or is sufficiently tiny (Sattler & Dunemann, 2001).The data set is partitioned off in keeping with a ripping criterion into subsets (Sattler & Dunemann, 2001).The C4.5 could be a supervised learning

classification knowledge-mining algorithmic rule accustomed build call trees and it uses Gain Ratio price to work out ripping attribute and missing data are neglected throughout the building method of decision tree. Ada Boost is associate degree reiterative procedure accustomed adaptively amendment the distribution of coaching examples so the bottom classifiers can concentrate on examples that are laborious to classify (Tan, Steinbach, & Kumar, 2006). They claimed the Modest Ada Boost outperforms Real Ada Boost, mild Ada Boost, C4.5 and SVM however they didn't mentioned the scale of the carcinoma dataset and didn't used completely different set of information with different range of attributes and tuples to check the performance of the algorithms. Boosting is one in all the leading powerful learning concepts introduced within the previous twenty years and it had been initially calculated for classification issues, however it's be extended to regression similarly (Hastie, Tibshirani, & Friedman, 2001). Thongkam, Xu, Zhang and Huang, (2007) used knowledge pre-processing RELIFE attribute choice, and modest Ada Boost Algorithms to retrieve data from the cancer survival database in Siam. Neural networks are software package systems sculptures queue when the process of learning and memory, they mimic the psychological feature medicine functions of the human brain (Mena, 2003). additionally as a result of its tendency to concentrate on coaching examples that are wrong classified, the boosting technique will be quiet vulnerable to over fitting (Tan, Steinbach, & Kumar, 2006). The learning of ANN (Artificial Neural Network) was impressed via makes an attempt to mimicking the brain practicality (Tan, Steinbach, & Kumar, 2006). The prediction from the ordinary classifier are merged afterwards with the help of weighted majority weight (Hastie, Tibshirani and Friedman, 2001) Rule based mostly methodology could be a data processing supervised learning algorithmic rule for activity classification and prediction by generate if-then rules that cowl all potential cases in a very dataset.

METHODOLOGY: - This manuscript compared the effectiveness and potency of information mining and applied math techniques want to classify cancer dataset survivability. The purpose of given learning is to discover the capabilities applied with statistical learning and data processing techniques employed in numerous cancer datasets. During this analysis study, a comparative study of multiple data processing and applied math learning classification algorithms was conducted for the express purpose of up current process techniques in prediction of carcinoma survivability and prognosis. The rail data processing tool and R applied math artificial language is use in testing the classification algorithms with cancer datasets. To come up with the predictive models, we've to method the cancer dataset in R, sent it to rail for analysis, then unreal the leads to R.

Overall approach that may be employed in predictive model is as follows.

1. Search and create training dataset as well as testing dataset.
2. Put on required data processing techniques and testing Bio-medical Datasets.
3. Focus on generation of predictive analysis model.
4. Examine model using defined test dataset.
5. Compare performance among the data mining and statistical learning techniques.

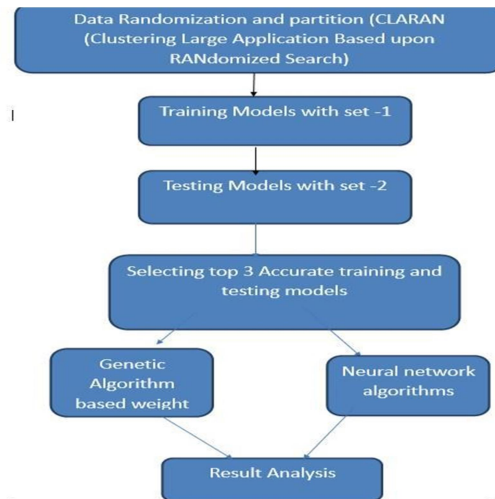


Fig 2: Proposed cancers Prediction System Methodology

1. Classification: a collection of classification rules is generated from the classification model, supported the options of the information within the coaching set, which may be went to categorify future knowledge and develop a stronger understanding of every class within the information.

2. Regression Analysis may be a methodology to map target knowledge victimization some identified variety of perform. It deals with estimation of associate degree output worth supported input values.

3. Time Series Analysis is that the worth of an attribute examined over a fundamental quantity typically at equally spaced time intervals. For instance, relying upon the conditions of a patient, values of bound attributes is also obtained on a daily or hourly basis. This could be went to predict future values or to see similarity between totally different time intervals.

4. Visualization Techniques visual image techniques are helpful ways of discovering patterns in an exceedingly medical knowledge set. Scatter diagrams in an exceedingly sheet of 2 fascinating medical attributes is wont to determine interesting subsets of medical knowledge sets.

5. Predictive Data Analysis: prophetic data modeling is a vital data processing task to see future data states on the idea of past and current values.

6. Neural Network: Once fascinating subsets are obtained, we tend to could use different data processing techniques on these subsets to get more information. this is often the foremost vital data processing technique, and diagnosing is a vital application of classification. Scatter diagrams in an exceedingly sheet of 2 fascinating medical attributes is wont to determine interesting subsets of medical knowledge sets.

7. Clustering: After the clusters are defined, objects are labeled with their equivalent clusters, and customary options of the objects are plotted for making category of cluster. Agglomeration is that the identification of categories or clusters for a collection of unclassified objects supported their attributes.

CONCLUSION: - Data mining and machine learning approaches to biological information system shows guarantees as a good and reliable technique to prediction of carcinoma survivability compared to traditional techniques like the Kaplan-Meier model. It's hoped that this study advances the understanding of the appropriateness and effectiveness of choosing the simplest data processing, machine learning and applied mathematics learning methodologies in prediction of carcinoma survivability. Rising the prediction's accuracy and exactitude rates is feasible by actions that embrace dynamic the dimensions of the variables, reducing the feature or choosing most reliable options victimization PCA, singular price decomposition (SVD), RELIEF or any strong feature choice algorithmic rule. Future analysis specific to applying applied mathematics learning and machine learning techniques in biological datasets must target selecting best algorithmic rule for a feature choice. The modification of information pre-processing techniques, adjusting runtime parameters, and generating ensemble strategies with totally different parameters could improve the exactitude and accuracy rates. Medical establishments trying to undertake data mining approach to get rid of bio-logical issue might be better with statistical learning progression for programmer, medicinal scientist and statisticians. Researchers have to be compelled to check up on their own biological information availableness for variables which may probably link to prediction of cancer survivability. Algorithms in R and Weka have built-in pre-processing capabilities that include discrediting numeric attributes, attribute selection; normalization of numeric attributes and binarization of nominal attributes.

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Role of Cloud Computing in the Modern Education System (21st Century)

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Abstract:-Cloud computing is a distributed computing technology which provides internet-based services. Cloud computing is dynamically scalable as mostly it is virtual. Due to the growing need of IT infrastructure; educational institutes spend a huge amount on Data servers, multiple software, Hitech devices etc. But cloud computing can provide cost effective, efficient & accessible solution to accomplish the needs and demands of the users. In this paper, we would discuss about an emerging technology of cloud computing that relies on existing technology such as Internet, virtualization, grid computing etc. This paper mainly concentrates on usage of cloud computing in education sector such as online compilers, Video conferencing using browsers, Cloud based data storage & ERP in education. This paper also explores usage of various applications of cloud computing with their advantages & disadvantages. The impact of cloud computing in education is evident which helps to accelerate collaboration between educational institutes and their students.

Keywords: - Cloud computing, virtual education, ERP, Data Storage, compiler

Introduction:-E-learning is a concept that integrates information technology in teaching and learning. The concept of teaching and learning is important to the educational institutions to expand learning and teaching methodologies. Over the past few years, advanced technology and cloud computing have caused an excellent variation in education and the way students get education. Students need not be present all the time in the school physically, as cloud computing offering them accessibility from anywhere as per their convenience.

Similar way, with the help of Cloud computing, teachers can also share notes, additional information from anywhere even after school time is over.

Cloud computing companies can promote their services in educational institutes with minimal usage of the local data centres. Accordingly, the cost of the infrastructure would be reduced with increase productivity, speed & security of data. Therefore, Cloud Computing is becoming a game changer, especially in education.

Models of Cloud Computing:-Cloud computing companies offer many type of services but following three are main categories of services.

- 1. SaaS (Software-as-a-service):** Service providers host the application which runs and interacts through web browser. There is no need to install the application on client's computer & hence simplifies maintenance & support. It is a method of providing software applications over the Internet according to the requirement on the basis of Subscription. SaaS helps you to manage the software application and handle any maintenance like software upgrades. Few cloud service providers of Saas are Yahoo mail, Gmail etc.

2. **Infrastructure-as-a-service (IaaS):** It can be used to satisfy the infrastructure needs of all stakeholders in education system with some specific hardware configuration for a specific task. This is a basic service which allows service provider to rent IT infrastructure on payable basis. Any education institute can access servers, storage space and connections, without purchasing and managing this internet infrastructure themselves. Service providers provide software along with Infrastructure required to run software. Amazon EC2, Gogrid are few service providers to provide IaaS services.
3. **Platform as a Service (PaaS):**-In PaaS service provider allows client to develop, test & manage software application. Client can create its own web or mobile application where he does not need to set up or manage infrastructure of servers, storage, databases needed for development. For the purpose of scalability sometimes PaaS clouds are created inside IaaS Clouds. Few examples of PaaS are Force.com, Windows Azure & Google app Engine.
4. **Database as a Service (DaaS):** This service provides client an access to database without actual set up of hardware & software installation. Here the provider maintains infrastructure & database & offers it as private cloud to client. DaaS or DBaaS services are beneficial mainly for small to medium sized educational institutes. Amazon Aurora, Dynamo DB, Google Cloud are few examples of DaaS category providers.

Advantages of Cloud Computing:

1. Cost effective solution

There is no need to buy Information technology infrastructure by Academic institute. In fact they have to pay only for the resources and services they consume and the storage require by them. The cost of purchasing licenced software for number of computers is reduced as they can take these software on rent.

2. Enhances collaboration in Work

Students, teachers and administrative staff can access any information from their computers. This flexibility in accessing data results into interdepartmental collaboration. Forms, text files, spreadsheets and presentations can be edited at the same time by different people from any computer. This helps to bring educators, students, and parents on the same platform.

3. Easy access & availability:

A cloud computing education platform also improves virtual and digital access to various applications and resources. Students are able to access the learning materials, notes and resources very easily and efficiently, irrespective of which devices & browsers they use. At the same time, students can also access to a repository of online books and materials, as the usage of online documents and digitized print media is increasing tremendously and the learners from different campuses can access the same material online.

4. Convenience in Time:

One of the biggest challenges for teachers is time. Since teachers and students can access materials from any place, teachers can save their time from making copies. It would be convenient for Teachers to compile material as all this information is stored on a cloud. Teachers can do grading & marking online & can also offer feedback on assignments and notebooks easily from their device. As every information is stored on large servers around the world with the help of cloud computing technology, even if teaching device like laptop is crashed, data would not be affected.

5. Backs up Information:

Information is stored on large servers around the world with the help of cloud computing

technology. This assures speedy access at any time, and help to take data backup in case of digital problem. Due to this Institutes store critical data on the cloud.

Disadvantages of Cloud Computing:

1. Dependency on Network Service Provider:

Cloud platforms are totally dependent on the network connection of an institution. The usage of broadband is directly proportional to volume of data managed through the cloud. As higher amount of data is managed, use of broadband will be increased which would turn to be costly. Even there could be a situation where due to break down of a server entire institute would go suddenly offline.

2. Less Control:

Since educational institutes are not having their own infrastructure, they have very limited control over data, updates & other services. Data is stored on the cloud offsite, so institute will have less control over the system and infrastructure setup. Cloud service provider controls & handles data.

3. Privacy:

When all the resources are stored online, there are few privacy risks. Cloud systems having lack of proper security measures, may be exposed to cyber-attacks, and data security becomes a big challenge. If a device with saved credential information gets stolen, the cloud platform and its resources become accessible to an unauthorized fraud user. To avoid these issues, we will need to undertake security steps.

Applications of Cloud Computing

1. Online Compilers:

Different programming languages require different compilers for compilation. Programmers generally download and install the required programming language along with dependencies, platform etc. into their devices like desktop, laptops etc. Since this installation is actually platform dependent, all pre-required specifications of the operating system need to be met therefore it is required to install as many number of compilers as languages you are using. But in cloud computing which is internet base service provides online compilers. Cloud Compiler is an online tool which supports users to compile and run their source code. Online compilers can perform the same task similar to locally stored compilers. In order to perform this task cloud compilers require the project's source code to be stored online and ask the user to access it via a web browser. The increase in awareness related to portability, compatibility, optimum utilisation of storage space & performance leads to rise in demand of providing an efficient cloud compiler. Cloud compiler is mainly provided in C,C++,Ruby, Python, PHP etc.

2. Video conferencing using browsers:

Video conferencing by cloud computing proved to be boon for entire education sector during ongoing pandemic but even before that it was used. It breaks traditional boundaries of classroom education. Getting education is right of every individual irrespective of region, sex, age & economical condition. Through video conferencing teacher's lectures can reach beyond classroom up to any interested individual who may not be available in the physical class. Particularly it is beneficial for students from rural areas who can also get quality education from the best tutors through cloud based video conferencing. Videoconferencing can be made more interactive by including various things like subject related videos, debates or group discussion between two or more groups etc.

3. Cloud based data storage:

In cloud based data storage you save your data at an off-site location which can be accessed by internet or private network. For educational institutes, student's related data like admission, Mark sheets, their personal information is vital. They also have financial data related to institute. It is always safe to keep this important data on cloud rather than keeping it on hard drive since it protects data from misplaced or stolen. Cloud providers also provide data backup service in case of disaster recovery.

Mainly there are two types of cloud storage, preconfigured storage which is known as unmanaged cloud storage & format able storage by client known as managed cloud storage. In managed cloud storage raw space is available where education institutes can store data as per their convenience. In unmanaged data, institute cannot format or install own file system.

Since education institutes have to maintain their data of past years also, their need of space of data storage is ever increasing. Education institute need not move their data from one location to other they can ask cloud service provider for an extra space to their storage environment. This scalability feature of cloud computing is important for education to reduce cost of IT infrastructure like servers, external storage device etc.

Another feature of cloud computing is multiple users can access stored data simultaneously. Since many stake holders like administrative staff, management, teachers & sometimes even students are involved. More than one user can access this stored data of education institutes. A single file access can be given to authorised persons to access & edit file from anywhere.

The data stored on cloud can be accessible from anywhere on any device & teachers or students need not be present physically in the school. This gives flexibility & convenience to students.

4. Enterprise resource planning in educational institutes:

Cloud based Enterprise resource planning or ERP's run on provider's cloud platform instead of on premises network. On premises ERP is software installed & managed by IT staff of education institute. Institute has to bear cost of maintenance, troubleshooting, updates etc. They also need to buy updated antivirus & other security softwares in case of onsite ERP's. Whereas in cloud based ERP's it is managed by service provider who is responsible for the application, data storage, security & features updates etc. Advantage of Cloud ERP's other than cost effectiveness is, it is less time consuming. Implementation time of cloud ERP's is less than on site ERP's since it does not require hardware setup or training of IT staff.

Important features of these ERP software's are secure access, real-time data update, event scheduling, remote logging etc. Education institutes require various modules, like Student admission, Examination result, Student Attendance, teachers & staff daily reporting & their leave management etc.

Conclusion:-Cloud computing is an emerging technology developed in last few years which could prove to be boon for educational institutes & Universities. Despite of certain drawbacks & limitations of cloud computing it is beneficial for all stakeholders like Students, teachers, Administration & Management. Cloud services offer flexibility, easy access & scalability to

teachers & students which makes E-learning more effective. By availing cloud services educational institutes can reduce their expenses on maintenance of IT infrastructure. In near future, cloud computing would replace storage devices, IT infrastructures at local level. The main objective of this paper is to draw attention towards this new technology which can be implemented effectively in education sector.

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STAGED CLASSIFICATION OF LUNG CANCER NODULES USING TWO DIMENSIONAL CONVOLUTIONAL NEURAL NETWORKS

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ABSTRACT: The disease of lung cancer is one of the largest reasons for deaths over the globe. The rate of survival of deaths due to lung cancer is 27% which can be extended to 50% if detected at an early stage. Lung cancer detection with the stage of the cancer is the research focus since last decade. The broad aim of the research work is the presentation of a model and examine the possibility of neural networks to predict the stage of lung cancer. The eight editions of TNM classification has been used for reference. The authors present a two-dimensional convolutional neural networks model for predicting the stage of the lung cancer. The dataset NSCLC-Radiomics-Genomics was used for experimentation with comparative ratios for training, testing and validation sets in the proposed model. The presented work achieved an accuracy of 99% with two-layered network. The authors also present the comparative analysis for validating the tuning of parameters and hyper parameters.

Keywords:-Convolutional Neural Networks, Lung cancer, Artificial Intelligence, Deep Learning, TNM staging, CAD systems

I. INTRODUCTION:-Combined genetic and not genetic changes, resulting from environmental factors which improperly enable or inactivate specific genes leading to neoplastic transformations or abnormal cell development, causes cancer. In the initial stage of cancer development, there is a lack of knowledge on key cellular events as well as environmental and internal factors that cause these changes [1]. The deaths due to lung cancer is always a major concern for any country over the globe. The latest study by the World Health Organization (WHO) [2] about cancer statistics states that lung cancer causes 18.4% of the total deaths in the world, but the crucial fact to note is nearly half of these deaths, i.e. around 9.4% are due to the poor prognosis. Also, according to the world cancer data, if we carefully analyze the world statistics, there are certain notable points. In the year 2017, nearly 49 million died because of 31 different reasons. However, nearly 18% of the people, i.e. 9.56 million people died due to cancer. Moreover, from 9.56 million, there were 1.88 million people suffering from lung cancer. In the last decade, there is not much increase in the rate of survival after lung cancer diagnosis. It is hardly round 9.3%. The average survival rate of any lung cancer patient is five year from the day of diagnosis. However, this rate is only applicable for the disease diagnosed at an earlier stage. The survival rate is 87% if detected at stage I while the rate is only 18 % if it is detected at Stage IV [3], [4], [5]. On the same note, the therapy and medication also depend upon the stage of the cancer. These two facts indicate how important it is to diagnose lung cancer at early disease.

In medical terms, an international standard of TNM staging system in the eighth edition [6] is followed worldwide for the staging process. This staging process gives a detailed indication about the exact state of the patient's disease. In this system, T represents the size and spread of

tumor, which is generally known as primary tumor, responsible to cause the disease. N represents the extent of disease spread to the nearby lymph nodes while M represents the spread of metastatic phase. This stage indicated whether the tumor has spread to the other organs of the body. With the advancements in technologies in the recent years, Computer Aided Diagnosis (CAD) [7] systems have gained interests of researchers as an aid of radiologists to detect the presence of cancerous lung nodule with the stage of lung cancer. The technologies like machine learning, artificial intelligence, and neural networks have proved as a sight of the future of predictions and diagnosis applications in healthcare industry. CNNs have always proved to be better in dealing with images than the traditional methods. In this comprehensive study authors present a two-dimensional CNN for predicting the stage of lung nodule. The division of this comprehensive study is as below: The section Material and methods explains the architecture and methods of CNN model. The experiments and discussion discuss the results and present comparative analysis. The authors then conclude with future insights.

II. MATERIALS AND METHODS

This section highlights the proposed methodology of the framework for staged classification.

2.1 Stages of Lung Cancer

Figure 1 represents the in-depth description of the lung cancer stages. The description of each stage is as follows:

TX: This is a primary tumor, with the appearance of the cells which are malignant in nature in the spaces between the bronchi which are not detected easily with the visual techniques

T0: no presence of primary tumor

Tis: carcinoma in situ

T1: The size of tumor is less than or equal to 3cm, which are in the midst of visceral pleura, not spreading in the nearby areas

T1a: Tumor is less in around to 2m or less in dimension

T1b: Tumor size varies in between 2 and 3 cm in dimension

T2: The size of tumor lies between 2 cm and 7 cm in dimension. The tumor is very large in size and grows to nearby hill areas without spreading to the whole lung area

T2a: Size of tumor lies between 3 cm and 5 cm in dimension

T2b: This stage characterizes the size of tumor within 5 to 7 cm in diameter

T3: The size of the tumor is more than 7 cm and covers surround areas: parietal pleural, chest, diaphragm, mediastinal pleura, phrenic nerve, tumor in the main bronchus, while carina or another separate nodule do not involve.

NX: Regional lymph nodes cannot be assessed

N0: No regional lymph node involvement

N1a: single station N1 involvement

N1b: Multiple station N1 involvement

N2a1: Single station N2 without N1 involvement

N2a2: Single station N2 without N1 involvement

N2b: Multiple-station N2 involvement, metastasis in ipsilateral mediastinal

N3: multiple station N2 involvement, metastasis in contralateral mediastinal

M0: No distant metastasis

M1: Distant metastasis

M1a: Separate tumor nodule in a contra lateral lobe, tumor with pleural nodules or malignant pleural

M1b: Distant metastasis

T/M	Subcategory	N0	N1	N2	N3
T1	T1a	IA1	IIB	IIIA	IIIB
	T1b	IA2	IIB	IIIA	IIIB
	T1c	IA3	IIB	IIIA	IIIB
T2	T2a	IB	IIB	IIIA	IIIB
	T2b	IIA	IIB	IIIA	IIIB
T3	T3	IIB	IIIA	IIIB	IIIC
T4	T4	IIIA	IIIA	IIIB	IIIC
M1	M1a	IVA	IVA	IVA	IVA
	M1b	IVA	IVA	IVA	IVA
	M1c	IVB	IVB	IVB	IVB

Figure 1. TNM Classification

2.2 Dataset

In the investigative study, authors have used the dataset from NSCLC-Radiomic-Genomics [8] which is a collection of 89 non-small cell lung cancer. The dataset is easily downloadable through the Cancer Imaging Archive (TCIA). The data provided is the CT scan, gene expression and the clinical data. The database of 1019 patient images with tumor phenotypes is created by the large number of quantitative image features. This has made possible to extract 440 image genomic features extraction. The class labels and clinical results are obtained from the experienced radiologists.

2.3 Steps in CAD system

A CAD system with an aim of classifying a lung CT scan into either stages or type of lung cancer consists of five sub steps, i.e., preprocessing, segmentation, detection, feature extract and classification. As the focus of the study is focused on the classification of the lung nodule into stages using CNN, the approach for other steps for CAD system are explained below.

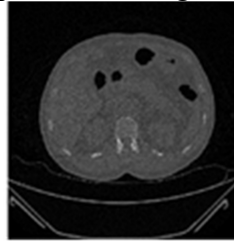
2.3.1 Image processing:

This is the initial step of a CAD system for enhancing the image [9] while maintaining the important and minute details of the image. The adaptive median filter is a non-linear filter that efficiently adapts the changing contrast in the grey-scale image. The proposed model has used the adaptive median filter for the purpose of enhancing the input image.

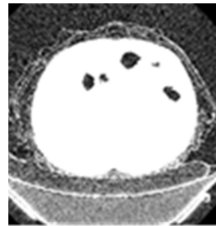
2.3.2 Image Segmentation:

Image segmentation [10] technique is used for the purpose of extracting regions with interests from the image in order to restrict the search space of the feature extractor model. This enhances the accuracy of the model and hence, segmentation output is of utmost importance in the system. The proposed model has used a combination of morphological operations for segmenting the lung structure from the CT scans eliminating the other details. Figure 2 depicts the output of the

image enhancement and segmentation step. Image segmentation [10] technique is used for the purpose of extracting regions with interests from the image in order to restrict the search space of the feature extractor model. This enhances the accuracy of the model and hence, segmentation output is of utmost importance in the system. The proposed model has used a combination of morphological operations for segmenting the lung structure from the CT scans eliminating the other details. Figure 2 depicts the output of the image enhancement and segmentation step.



(a)CT scan



(b)adaptive median filter



(c)segmented
lungs

Figure 2. Images after processing

2.3.3 Feature extraction and classification:

The output from the segmentation step is directly provided as an input to the CNN model. The CNN model automatically extracts the relevant features and use them for classification task. The type of classification used here is the multi-class classification as there are more than two classes in the target class labels.

CNN.CNN [11], [12], [13] is a special type of ANN with the feed forward step only which is specially used for image analysis. It learns through the building of relationships through the neurons. The pre-processing is very less and the focus is more on understanding the complicated patterns existing in the images. For images, while converting the image pixels to vectors it is important to hold the spatial information about the pixels which is done in pre-processing step known as convolution step. The further layers in the CNN are pooling layer, fully connected layer. The pre-processing steps holds the important data converting the images into vectors for efficient processing, the next step performs dimensionality reduction reducing the redundant data. Then the data is then vectored and multi-layer perceptron is applied to apply the

classification step. Convolution layer, a combination of mathematical operations. These functions are nothing but kernel function acting as filters to hold the important features with just the multiplication of each element. A window is sliced over the whole image to go through this operation producing a feature map of the image as a result. Whenever there is a strong correlation between the window and image pixel, the feature map contains a large value while when the relation is weak, the feature map contains a smaller value. There are three important hyper parameters in the convolution layer in CNN – kernel size, number of kernels and stride. The kernel size is the controllable parameter that determines the weight of the model. For example, a 4X4 kernel will have 16 neurons for connections. The kernel dimension is the same size as that of the input images. The features in the images are controlled by the kernel size. The more the number of kernels, the more features are captured from the images, and more accurate is the model. Each kernel, when sliced over the entire image creates a feature map which are then concatenated at the end of the process. In order to have a similarity in the output tensor and input volume, there is also an option of padding. Padding is added to according to the kernel sizes, which are generally zeros or the value of the edges. Nonlinear activation functions. The outputs from the convolution layer are passed to the non-linear activation functions like we discussed initially. Previously, Tanh or sigmoid were used for the activations. However, these days rectified linear units are used that simply saturates the negative values to 0 for easy calculations.

Pooling layer. The pooling layer is the layer for dimensionality reduction, where the size of the convolution layers' output is down sampled for reducing the computation, complexity and training time. The position of pooling layer is between the convolution layer and the fully connected layers. There are no learnable parameters in this layer. However, pooling has certain hyper parameters, like strides, filter size, and padding, similar to convolutional layer.

Fully connected layers. This layer produces the rectangular shaped outputs. The layer is multiplied with weight matrix after converting it to vector. The fully connected layers allow the multiplication of the vectors with the weight vectors which is followed by the functionality of multi-layer perceptron. Following steps summarizes the steps for the proposed models.

Step 1: Load datasets for *staging* images

Step 2: Count each label to understand the distribution of the data

Step 3: Define number of training examples

Step 4: Define layers for CNN and their parameters

Step 5: Specify the training options with parameters like learning rate, epoch and so on

Step 6: Train the dataset

Step 7: Validate to calculate accuracy and other validation metrics

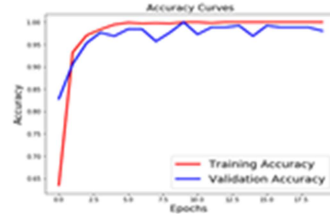
The following table represents the parameters and hyper parameters for the 2-D CNN model:

Table 2. Parameters and hyper parameters for the CNN model

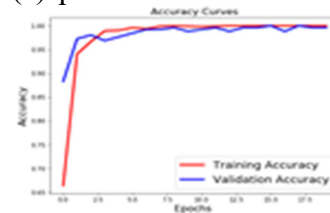
Parameter	Size
Convolution layer 1	3X8
Max Pooling layer 1	2X2
Convolution Layer 2	3X16
Max Pooling Layer 2	2X2
Fully connected layer	2
Learning rate	0.001
Epochs	25
Validation Frequency	20

III.RESULTS AND DISCUSSION

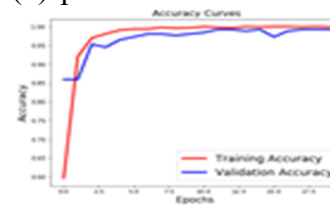
The main contribution of this research study is the classification of given nodules into stages of lung cancer. As mentioned earlier, in technical terms, there are seven stages of Lung cancer, .i.e. T0/Tis, T1a, T1b, T2b, T3, T4. Among these, the stage pTx is very complex to be determined from the given CT scan of images as a lot of more clinical information and its analysis is also required. Hence, we have specifically skipped that stage in our classification step. Unlike the first step of classification, this is a multi-class classification problem as there are more than two classes for classification. The dataset we used for experimentation, i.e. the NSCLC dataset contained variation in the number of samples available under each of the stages. Using such non-uniform number of samples gave very vague results in the numerical experiments. Hence, we have skipped the samples which are enough in number for studying this step. After eliminating these samples, we were finally left with only five samples of classes, i.e., pT1, pT2, pT2b, pT3, pT4.Using the model as described in Table 2, the accuracy obtained was 98%. Hence, the experiments were then further continued for validation the split ratios. Four split ratios for training, testing and validation were used: 50-40-10, 60-30-10, 70-20-10, and 80-10-10. The training and testing graphs are illustrated in the following figure.



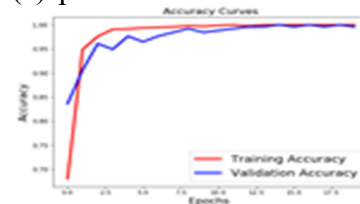
(a)split ratio 1



(b)split ratio 2



(c)split ratio 3



(d)split ratio 4

Figure 3. The curves for accuracy for training and validation datasets

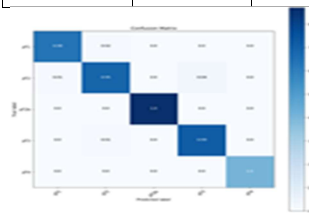
From the graphs, we can see that the training and validations accuracies of graph 3 has almost converged giving good results. Following figure illustrates the confusion matrices for the models with their accuracies in Table 3.

The accuracies found were depicted in the following table.

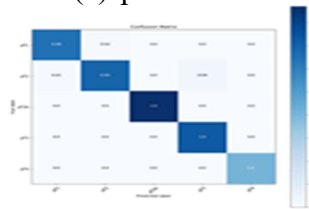
Table 3. Comparative analysis of the split ratios for the CNN model.

The confusion metrics in figure 4 of all the models represents how well that model has performed all the target classes in the model. There is only 1% difference among these models. However, when we consider a large amount of data and precision in terms of detection of the diseases, the minute accuracy is very crucial in aid of the radiologists. From table 3, it is validated that the split ratio 70-20-10 is stable in all the performance measures. Hence, authors have used the ratio in the final architecture.

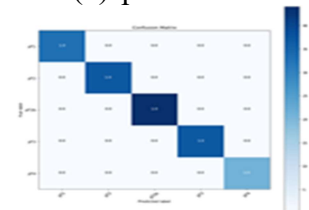
Measurement	50%-40%-10%	60%-30%-10%	70%-20%-10%	80%-10%-10%
Accuracy	0.98	0.98	0.99	0.98
Precision	0.99	0.99	0.99	0.98
Recall	0.99	0.99	0.99	0.98
F1-score	0.99	0.99	0.99	0.98
Time (s)	129	122	130	120



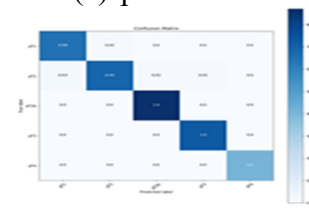
(a)split ratio 1



(b)split ratio 2



(c)split ratio 3



(d)split ratio 4

Figure 4. Confusion matrices for multi-class classification

IV. CONCLUSION:-The final model of CNN gave accuracy as 99%. The classification of given lung image can be classified into the stage of lung cancer is the main contribution of this research. The accuracy of CNN model for second stage classification was also 99 with +_ bias of 2%.

V.FUTURE SCOPE:-In future, the CAD system can be generalized and can be used for other types of cancers.

ACKNOWLEDGEMENTS

Conflict of Interest: The authors declare no conflict of interest.

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Knowledge Regarding Root Cause Analysis Tools among Students studying Basic B.Sc. Nursing

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Shri Jagdish Prasad Jhabarmal Tibrewala University

ABSTRACT: - Nursing is a noble profession considers being the integral part of the health care delivery system in every country. There is a huge demand for nurses worldwide and to fulfill this demand there is need for the successful completion of the Basic B.Sc. Nursing course by the nursing students. It is observed that a great number of students drop this courses due to various factors. The aim of the study was to enable the nursing students to understand the root cause analysis tools and its implementation to find out the root causes of their poor performance in the course of nursing studies. The objective of the study was to assess the knowledge of the nursing students regarding root cause analysis tools. A quazi experimental pre-test, post-test control group design was used to achieve this objective. Demographic variables and the knowledge was assessed using basic sociodemographic proforma and the structured knowledge questionnaire respectively. After the assessment of pre-test knowledge an awareness programme on Root cause analysis was implemented. On the 7th day after the intervention the post test was conducted. Analysis was done using descriptive and inferential statistics. Frequency and percentage was used to describe the variables. Paired t-test was used to check the effectiveness of integrated training program on knowledge of the students and showed to be very be effective. The study findings revealed that there is an association between knowledge scores. The study concluded that the training program on Root caues analysis is found to improve the knowledge among students studying Basic B.Sc. Nursing.

Keywords-- Root Cause Analysis, Basic B.Sc. Nursing students

INTRODUCTION:-Root cause analysis is a six sigma quality improvement tool used world-wide to in various fields to improve the quality of products. Root cause analysis is also used in hospital settings for prevention of various errors or near misses in the patient care. RCA is used as a tool to identify the root causes of the adverse events or errors in hospital. The nursing students are the future of nursing field and it is essential for them to have a good problem solving and decision making capacity. RCA is also used in education fields to identify the causes of the students poor performance in health care related fields. It is very much important that the nursing students know about the implementation of RCA tools.

OBJECTIVES

- To assess the pre-existing knowledge regarding the RCA tools among the nursing students in experimental and control groups
- To develop and implement the training program on tools of RCA among students in the experimental group.
- To assess the post test knowledge scores among the experimental and control groups to assess the effectiveness of the training program.

METHODOLOGY:- The research approach used was quantitative in nature. Quasi-experimental research design was used. The study was conducted among 40 nursing students studying Basic B. Sc. Nursing in colleges of nursing in Maharashtra. They were assigned to experimental and control group using non-probability convenience sampling technique. Structured knowledge questionnaire was used to assess the knowledge regarding RCA tools and

baseline proforma to assess the socio demographic variables. It took around 20-25 minutes to collect data from each sample. The study was conducted in selected nursing institutes in maharashtra.

ASSUMPTIONS

1. The nursing students may have information regarding basic problem solving techniques.
2. Nursing students may be using some kind of problem solving method.

HYPOTHESIS

H0: There will be no significant difference in knowledge regarding root cause analysis tools among nursing students

H1: There will be significant difference in knowledge regarding root cause analysis tools among nursing students

VARIABLES

Independent Variable:-Training program on knowledge regarding Root cause analysis tools.

Independent Variable:-Knowledge of the nursing students regarding Root cause analysis tools.

STATISTICAL ANALYSIS

Descriptive Statistics

Frequency and percentage distribution was used to analyze the demographic data of nursing students.

Inferential statistics

Paired t-test was used to check the effectiveness of training program.

Results and Discussion:

1. Socio-demographic data of the sample
2. Pre-existing knowledge regarding Root Cause Analysis tools among nursing students
3. Effectiveness of the training program

1. Distribution of nursing students according to Socio-demographic data by frequency and percentage

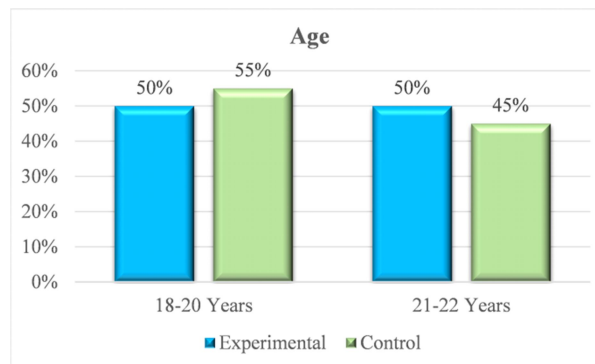


Figure 1. : Bar diagram showing the distribution of the age in the experimental and control group.

The above diagram shows the distribution of nursing students by age group. Majority of the samples were belonging to the age group of 18-20 years, in experimental group, 50% of the nursing students had age 18-20 years and 50% of them had age 21-22 years. In control group, 55% of the nursing students had age 18-20 years and 45% of them had age 21-22 years.

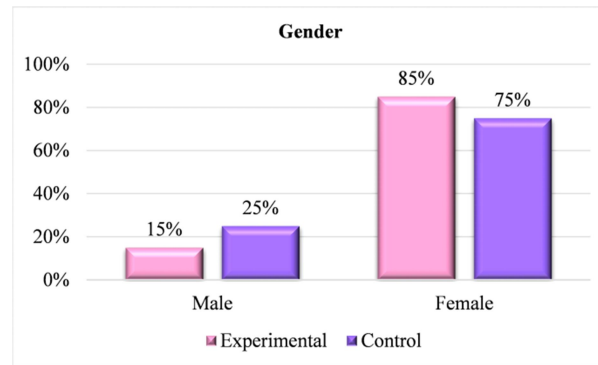
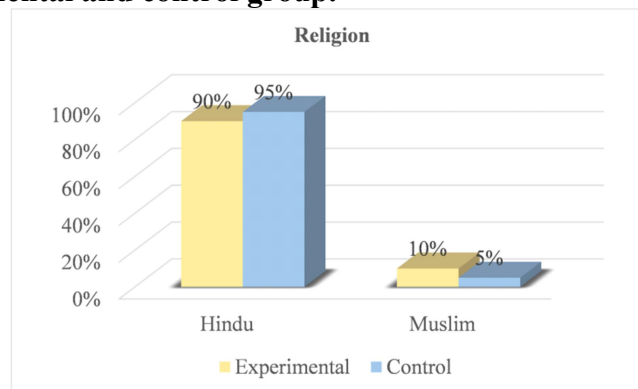


Figure 2 : Bar diagram showing the distribution of the nursing students according to their gender in the experimental and control group.



In experimental group, 15% of them were males and 85% of them were females. In control group, 25% of them were males and 75% of them were females.

Figure 3 : Bar diagram showing the distribution of the nursing students according to their religion in the experimental and control group.

In experimental group, 90% of them were Hindu and 10% of them were Muslim. In control group, 95% of them were Hindu and 5% of them were Muslim.

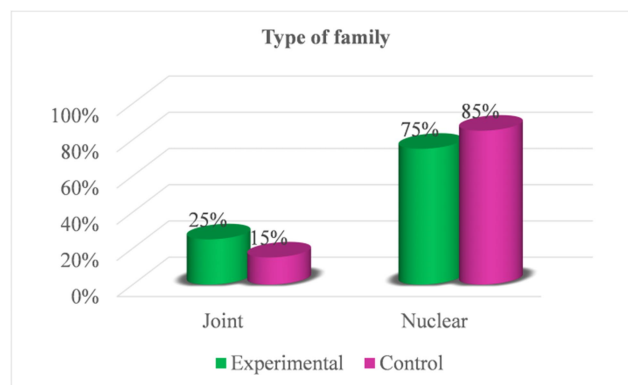


Figure 4: Bar diagram showing the distribution of the nursing students according to their type of family in the experimental and control group.

In experimental group, 25% of them had joint family and 75% of them had nuclear family. In control group, 15% of them had joint family and 85% of them had nuclear family.

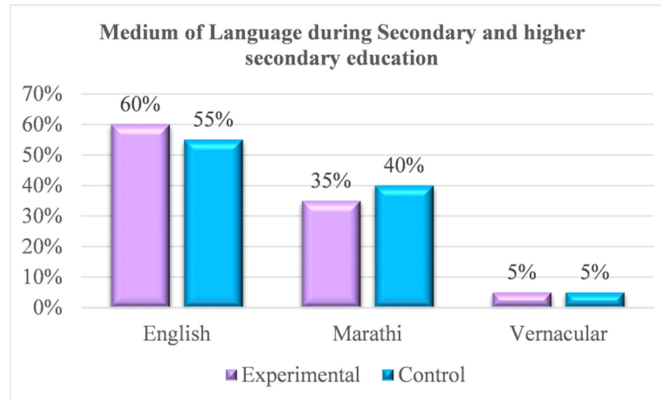


Figure 5: Bar diagram showing the distribution of the nursing students according to their medium of language in the experimental and control group.

In experimental group, 60% of them were from English medium, 35% of them had Marathi medium and 5% of them had vernacular medium during Secondary and higher secondary education. In control group, 55% of them were from English medium, 40% of them had Marathi medium and 5% of them had vernacular medium during Secondary and higher secondary education.

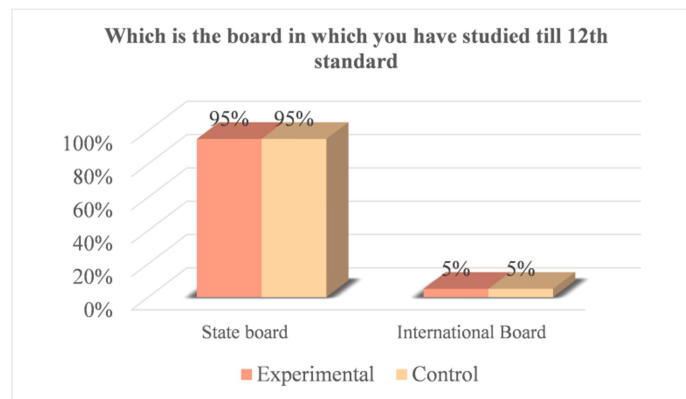


Figure 6: Bar diagram showing the distribution of the nursing students according to their board studied till 12th standard in the experimental and control group.

In experimental group, 95% of them had State board and 5% of them had international board till 12th. In control group, 95% of them had State board and 5% of them had international board till 12th.

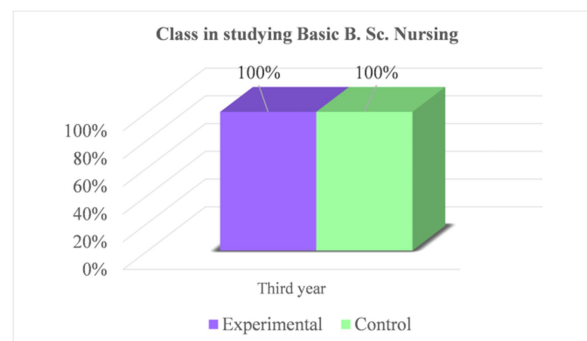


Figure 7: Bar diagram showing the distribution of the nursing students according to their class studying in Basic B.Sc. nursing in the experimental and control group.

In experimental and control group, all of them were from third year Basic B.Sc. Nursing.

Section 1: Analysis of data related to pre-existing knowledge regarding tools of Root Cause Analysis among nursing students.

Table 1: Pre-existing knowledge regarding tools of Root Cause Analysis among nursing students.

N=20, 20

Knowledge	Experimental		Control	
	Freq	%	Freq	%
Poor (Score 0-16)	6	30%	7	35%
Average (Score 17-32)	14	70%	13	65%
Good (Score 33-48)	0	0%	0	0%

In experimental group, 30% of the nursing students had poor knowledge (Score 0-16) and 70% of them had average knowledge (score 17-32) tools of Root Cause Analysis. In control group, 35% of the nursing students had poor knowledge (Score 0-16) and 65% of them had average knowledge (score 17-32) regarding tools of Root Cause Analysis.

Section 2: Analysis of data related to effectiveness of integrated training programme on knowledge regarding tools of root cause analysis in terms of improving academic performance among nursing students.

Table 2: Effectiveness of training programmers on knowledge regarding tools of root cause analysis among nursing students.

N=20

Knowledge	Experimental				Control			
	Pretest		Posttest		Pretest		Posttest	
	Freq	%	Freq	%	Freq	%	Freq	%
Poor (Score 0-16)	6	30%	0	0%	7	35%	8	40%
Average (Score 17-32)	14	70%	5	25%	13	65%	12	60%
Good (Score 33-48)	0	0%	15	75%	0	0%	0	0%

Section 3: Analysis of data related to comparison of the post-test knowledge with the pre-test knowledge regarding tools of root cause analysis among nursing students.

Table 3: Paired t-test for comparison of the post-test knowledge with the pre-test knowledge regarding tools of root cause analysis among nursing students.

N=20

	Mean	SD	t	df	p-value
Pretest	18.6	3.0	13.0	19	0.000
Posttest	34.5	4.1			

Researcher applied paired t-test for comparison of the post-test knowledge with the pre-test knowledge regarding tools of root cause analysis among nursing students. Average knowledge score in pretest was 18.6 which increased to 34.5 in posttest. T-value for this test was 13 with 19 degrees of freedom. Corresponding p-value was small (less than 0.05), the null hypothesis was rejected. An integrated training program was found to be significantly effective in improving the knowledge regarding tools of root cause analysis in terms of among the nursing students.

CONCLUSION:- The RCA tools are used worldwide in health care sectors to ensure patient safety in the hospitals. The student nurses should have basic knowledge regarding tools used for implementing Root cause analysis. The study concluded that there was improvement in the

knowledge level of the nursing students regarding the Root cause analysis tools. The study further recommends that the topic of root cause analysis should be included in the syllabus for Basic B.Sc. Nursing to enable student nurses to be prepared to face as well as solve the future challenges in nursing care.

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MULTICORE FACE TRACKING USING A PIPELINED MEMORY-EFFICIENT ARCHITECTURE

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ABSTRACT:-Using this enhanced abstract, we offer a multicore - compatible pipelined parallel architecture for face detection. Video frame acquisition and skin pixel identification modules operate sequentially on an image frame in the framework's design. Using Binarization and Morphological operations, and Connected Component analysis modules are all included. A multicore pipeline processes the successive lines in a frame. Multicore X MOS microcontroller embedded system realization executes drivers for photo detector as well as LCD interface on multiple cores, as well as images processed at various levels. For a 480x272 picture, the realization achieves an 8-frames-per-second frame rate. Because it uses a single X-MOS slice KIT with and a support for cameras, LCDs, & other devices, the system is also space-efficient.

Keywords:- Face Tracking, Multicore, Pipeline

INTRODUCTION:-Observation, fingerprinting, and robotics all require face recognition and tracking as a vital component of computer vision with artificial intelligence. The amount of work done and the number of methods presented is considerable [1]. Algorithms which use Haar, skin pixels and histograms are most common. It takes a lot of computing power to get the information you want out of a lot of video footage. Face detection also necessitates a high-performance implementation due to the need for real-time processing. Face detection embedded implementation is a difficult problem to solve. VLSI implementation of face detection has recently been studied in detail [2], [3]. Because it can quickly bring a parallel system to market compared to FPGAs, the multicore processor [4], [5] has recently attracted more attention.

The work on multicore face detection realization is still in its infancy.

[6] Proposes an ASIP-based multicore architecture for Viola and Jones' algorithm. Using Altera FPGA and external memory, a working prototype of the design was created. Another study [7] used a 64-processor multicore system with shared memory to implement the same technique. Because the complete video frame must be stored in memory, this method has a high memory need.

An X MOS multicores-based system for pipelined face identification is described in this expanded abstract. In order to provide a low space and low power solution, our system processes a stream of video with frames without keeping them in an external memory.

PROPOSED MULTICORE PIPELINED FACE DETECTION TECHNIQUE:-A skin-pixel detection algorithm is used in then a new face detection method. To identify pixels that correspond to faces, each pixel is compared to a typical range of human skin colors. Then an image is then thresholded to produce a binary-image. To locate the skin pixels, we use the skin

color detection approach reported in [8]. Morphological processing is applied to the binary picture, which removes any extraneous skin pixels & also fills in any holes in the skin-pixel components. Then a binary image is subjected to connected component analysis [9], which determines the location of the face using bounding box coordinates. This data can be used in a variety of ways, including biometrics and vision-based robotics motion control. This technology has been used to display a single face on an LCD panel. A multicore design was used to build the pipeline. As threads, the parallel tasks are conducted on the numerous cores. Our system's pipelined stages and servers, which interface with diverse devices like LCDs and image sensors, run in parallel. Figure 1 depicts the overall system's task breakdown. The entire system is built on seven cores. Internal memory is shared by all these cores to store temporary results. A core uses a moveable pointer to fetch a line from its previous one. There is only one memory block held by one core at a time, and that is where the movable pointer points to. Once a processing on that line is complete, the pointer is released. The previous processed line is likewise passed on to the next core by the core. As a result, each core has two buffers: one is currently being processed, while the other is being used by the core after it. Channels and shared memory are used to communicate between the cores. There is a constant stream of rows of every image frame between the various stages. To acquire rows of a full-color image, Bayer interpolation is applied to the raw data from the image sensor. Rows like this are subsequently analyzed via the image processing pipeline, which includes features like detecting skin pixels, performing morphological operations, and analyzing connections between components. By enclosing the area with a image's facing, the linked component analysis's result can be annotated. The previous frame's CCA results are used to annotate the current video frame. The LCD shows the image with the annotations. An LCD server keeps the screen up-to-date. All of these concurrent processes are made possible by the multicore architecture.

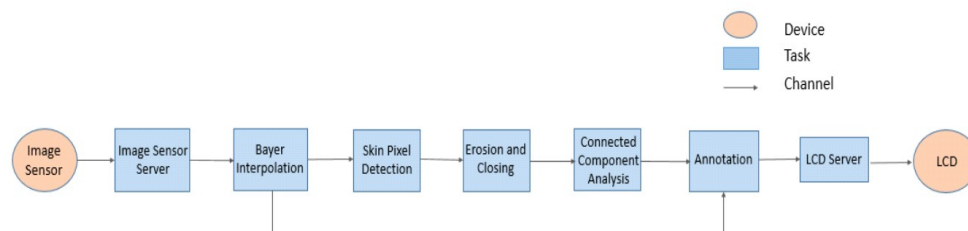


Figure. 1. Task Flow-diagram

CORE XMOS INPUT INTRODUCTION:-For the suggested face detection system; XMOS used an L16 slice KIT development board with a two-tile multicore microcontroller powered by 128 KB of SRAM and additional circuitry. Fig. 2 shows the x CORE architecture of each of the tiles. Due to its support for interface with numerous devices accessible as slices, slice KITs make rapid system prototyping simpler. Slices of LCD and image sensor are used in our solution. The photo editing pipeline is located on one tile, while the LCD server is located on another. A 272x480 pixel LCD screen is used in this device.

To make use of the pipelined architecture, the system was written in XC, a parallel programming language. Parallelism, reconfigurable ports, and event handling are all available on XMOS microcontrollers thanks to the XC programming language, which includes additional statements

that take advantage of these characteristics. For execution using the XTAG attached to USB port of the PC, binaries are imported to the XMOS device on slice KIT and are compiled using xTIME composer Studio programming environment. In addition to the onboard flash, the slice KIT contains a USB port for storing binaries so it can be used in stand-alone mode.

For achieves an eight-frame-per-second frame rate for photos shot at the LCD range of 272x480. Processing images on the LCD is not required in the majority of vision applications. In order to operate other devices like motors, the processing results are fed back to other devices for further processing. For processing, frame resolutions lower than the video rate is sufficient in these applications. The real-time processing needs might be met with an eight-frame per second frame rate.

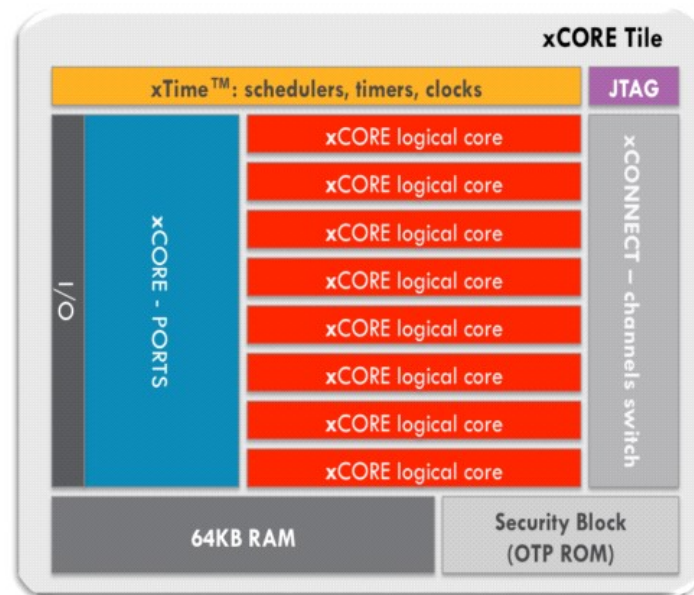


Figure. 2. X CORE Architecture

CONCLUSION:-We described a memory-efficient parallel pipelined face detection method that may be implemented on a multicore architecture in this extended abstract. Since the pixel stream is processed instead of the complete image, this reduces the amount of storage needed. According to our research, the system is built on an algorithm that detects skin pixels and related component analysis. A multicore XMOS processor implementation has been described. A seven-core processor and fewer than the 48 Kilo Bit of on chip memories are required for an implementation. Eight frames per second was the maximum processing speed for the embedded system, proving its capability for the recognition of faces in real time.

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A study to assess the health care on knowledge, attitude and practice (KAP) regarding diabetes mellitus and hypertension among elderly population in urban area of Dharwad Karnataka.

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ABSTRACT

BACK GROUND OF THE STUDY

India has a total population of 1028.61 million people, of which 7.46 percent (76.73 million) are above the age of 60. (NFHS III). Women accounted for 48.2% of the senior population, with widows accounting for 55%. 73 percent of the elderly were illiterate and relied on manual work. **Objectives:** To assess the knowledge about health care among elderly population with diabetes and hypertension, To determine the attitude towards health care among elderly population with diabetes and hypertension, To identify the practice towards health care among elderly population with diabetes and hypertension, To correlate the KAP on health care among elderly population with diabetes and hypertension, To find the association between KAP and selected demographic variable of elderly population with diabetes and hypertension. **Design:-**A descriptive design was used for the study. The study sample composed of 60 diabetes mellitus and hypertension clients in selected urban area of Dharwad district. **Result:-**The level of diabetes knowledge among elderly population in urban area majority 48 (80%) had moderate knowledge and the level of hyper tension knowledge among elderly population in urban area majority 51(85%) had moderate knowledge. The level of diabetes attitude among elderly population in urban area majority 34(53.33%) had Positive attitude and the level of hypertension attitude among elderly population in urban area majority 36(60%) had Positive attitude The level of diabetes practice among elderly population in urban area 32 (53.33%) had good practice and the level of hypertension practice among elderly population in urban area 36 (60%) had good practice.

Conclusion: Majority of diabetes and hypertension had moderate knowledge, most of the diabetes and hypertension had positive attitude and majority of diabetes and hypertension had good practice among elderly population in urban area.

Key Words:- Knowledge, Attitude, Practice, Diabetes Mellitus and Hypertension.

INTRODUCTION:-The world's older population has been steadily growing over time, it is the accelerated pace. The rate of growth is rapid with both overall numbers and proportions. This demographic transition is attributed to the decreasing mortality and fertility rates due to the availability of better health care services¹. Diabetes mellitus is defined as the fasting glycaemia $\geq 1.26\text{g}/1(7.0\text{ mmol}/\text{L})$ or glycaemia (75g) $\geq 2\text{g}/1(11.11\text{ mmol}/\text{L})$. People with postprandial or post loading glycaemia between 1.40 and 1.99g/1 (7.78-11.06 mmol/L) suffer from a reduction in glucose tolerance. Diabetes mellitus is a metabolic disorder of multiple aetiologies. It is characterized by chronic hyperglycaemia together with disturbances of carbohydrates, fat and protein metabolism resulting from defects of insulin secretion, insulin action or both. It is

classified into two types i.e., Type-1 diabetes and Type-2 diabetes². Type 2 making up about 90% of the cases. According to the Indian Heart Association, India is the diabetes capital of the world with a projected 109 million individuals with diabetes by 2035. Similarly, High blood pressure is a major public health problem in India is rapidly increasing among both urban and rural populations. In fact, hypertension is the most prevalent chronic disease in India. Among urban dwelling men and women in India, the prevalence of hypertension is 25.5% and 29% respectively whereas it is 14% and 10.8% respectively in rural communities¹. Overall, Hypertension entraps 26.4% of the global population, affecting about 972 million individuals and is projected to comprise 29.2% of the world population in 2025. The prevalence increases with advancing age, such that as much as half of individuals aged between 60 to 69 years are hypertensive and this increases to 60% to 70% in people above the age of 70.³

Objectives of the Study

1. To assess the knowledge about health care among elderly population with diabetes and hypertension.
2. To determine the attitude towards health care among elderly population with diabetes and hypertension
3. To identify the practice towards health care among elderly population with diabetes and hypertension
4. To correlate the KAP on health care among elderly population with diabetes and hypertension
5. To find the association between KAP and selected demographic variable of elderly population with diabetes and hypertension.

II. MATERIALS AND METHODS:-The descriptive survey approach has been used in view of accomplishing the main objectives of the study. A total of 60 elderly populations with diabetes and hypertension in selected urban Dharwad Karnataka were selected by purposive sampling technique. The nature of the study was explained to the subjects and written consent was obtained. They were assessed for the level of knowledge, attitude and practices regarding health care of diabetes mellitus and hypertension by using structured questionnaire for knowledge, structured attitude checklist and structured practise checklist was created. The tool consists of fifteen questions obtain socio demographic data, fifteen structured knowledge multiple choice items each related diabetes mellitus and hypertension. Fifteen each structured attitude checklist items of diabetes mellitus and hypertension and fifteen each structured observational checklist items for assessing the practice of diabetes mellitus and hypertension. The tool was validated by experts in field of public health nursing doctors and dietician. The collected data was organized and analysed based on the objectives by using descriptive statistics.

III. RESULTS

SECTION-I

A. Frequency and percentage distribution of diabetes mellitus and hypertension clients according to their selected demographic variables.

The study sample composed of 60 diabetes mellitus and hypertension clients in selected urban area of Dharwad district. The selected demographic variables are described under sub headings

viz. age, gender, religion, educational status, monthly income of the family, economic dependency, dietary pattern, exercise, physical activity, marital status, type of family, family members, occupation, family history of diabetes mellitus and hypertension and routine health check-up in Table 1 and Figure

Table: 1**n= 60**

S No	Demographic Variable	Samples	
		Frequency	%
1.	Age in Years		
	a. 60-64	25	41.6
	b. 65-69	10	16.7
	c. 70-74	15	25.0
	d. 75-79	10	16.7
2.	Gender		
	a. Male	38	63.3
	b. Female	22	36.7
3.	Religion		
	a. Hindu	36	60.0
	b. Muslim	14	23.3
	c. Christian	05	8.3
	d. Jain	05	8.3
4.	Educational Status		
	a. No formal (illiterate)	32	53.3
	b. Primary incomplete	12	20.0
	c. Primary complete	06	10.0
	d. Secondary incomplete	2	3.3
	e. Secondary complete	2	3.3
	f. PUC	2	3.3
	g. Degree	2	3.3
	h. Professional	2	3.3
5.	Marital Status		
	a. Single	15	25.0
	b. Married	30	50.0
	c. Divorced	08	13.3
	d. Widow/ Widower	07	11.7
6.	Type of family		
	a. Nuclear	40	66.6
	b. Joint	20	33.3
7.	Family Members		
	a. Spouse	12	20.0
	b. Spouse and children	12	20.0
	c. Children only	14	23.3
	d. Living alone	10	16.6
	e. Relatives	12	20.0
8.	Occupation		
	a. Unemployed(Retried) Pensioner	13	21.6
	b. Farmer	12	20.0
	c. Merchant	19	31.7
	d. Labor	10	16.7
	e. Other specify(house wife)	06	10.0
9.	Monthly income of the family		
	a. ≤ 5000	30	50.0
	b. 5001-10000	20	33.3
	c. 10001- 15000	5	8.3
	d. ≥15001	5	8.3
10.	Economic Dependency		
	a. Dependent	35	58.3
	b. Independent	25	41.7
11.	Dietary Pattern		
	a. Vegetarian	38	63.3

	b. Mixed	22	36.7
12.	Exercise		
	a. Routine	35	58.3
	b. Occasional	10	16.7
	c. Nothing	15	25.0
13.	Physical Activity		
	a. Sedentary	25	41.7
	b. Moderate	20	33.3
	c. Heavy	15	25.0
14.	Family history of diabetes mellitus and hypertension		
	a. Yes	35	58.3
	b. No	25	41.7
15.	Routine health check-up		
	a. Primary health center	20	33.3
	b. Private clinic	20	33.3
	c. Private hospital	10	16.7
	d. ESI	10	16.7

SECTION – II A. The Mean, Median, Standard Deviation Of Regarding Diabetes Mellitus Among Elderly Population In Urban Area.

Tools	Mean	Median	S.D
Knowledge	9.26	10	1.91
Attitude	18.13	18	1.58
Practice	12.36	16	1.59

Table 1.2 reveals that the knowledge mean score of diabetes in elderly populations was 9.26 with standard deviation of ± 1.91 , median of 10.

The item related in the Table 2 showed that the attitude mean score of diabetes mellitus in geriatric population was 18.13 with standard deviation of ± 1.58 , median of 18.

Table 1.2 shows that the practice means diabetes mellitus score in geriatric population was 12.36 with a standard deviation of ± 1.59 , a median of 16.

SECTION – IIB. The Mean, Median, Standard Deviation Of Regarding Hypertension Among Elderly Population In Urban Area.

Tools	Mean	Median	S.D
Knowledge	8.26	9	1.81
Attitude	12.14	13	1.38
Practice	12.36	14	1.63

The result of the study revealed geriatric population knowledge mean score on hypertension was 8.26 with a standard deviation of ± 1.81 , a median of 9.

Statistical analysis indicated that the geriatric population attitude mean score for hypertension was 12.14 with a standard deviation of ± 1.38 , a median of 13.

A result obtained implies which each practice average of hypertension in the geriatric population was 12.36 with a standard deviation of ± 1.68 , a median of 14.

SECTION IIIA – Knowledge Regarding Diabetes Mellitus among Elderly Population in Urban Area

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 distribution of study subjects according to the level of Knowledge among elderly population in urban area majority 48(80%) had moderate knowledge and Inadequate knowledge 7 (11.66%) Adequate knowledge only 5(8.33%) of elderly population in urban area.

SECTION III B – Knowledge Regarding Hypertension among Elderly Population in Urban Area.

n=60

Level of hypertension & Score	Frequency	Percentage
Inadequate (1-8)	04	6.66%
Moderate (11-18)	51	85%
Adequate (21-28)	05	8.33%
Total	60	100%

The distribution of study subjects according to the level of Hypertension among elderly population in urban area majority 51(85%) had moderate knowledge and Inadequate knowledge 4 (6.66%) Adequate knowledge only 5(8.33%) of elderly population in urban area.

SECTION – IV.A Attitude regarding diabetes mellitus among elderly population in urban area.

n=60

Levels of attitude	Frequency	Percentage
Negative attitude	11	21.66%
Moderate attitude	15	25%
Positive attitude	34	53.33%
Total	60	100%

The Distribution of study subjects according to the level of attitude among elderly population in urban area majority 34(53.33%) had Positive attitude and moderate 15(25%) and 11 (21.66%) had Negative attitude.

SECTION-IV.B Attitude regarding hypertension among elderly population in urban area.

n=60

Levels of attitude	Frequency	Percentage
Negative attitude	10	16.66%
Favourable attitude	14	23.33%
Positive attitude	36	60%
Total	60	100%

The distribution of study subjects according to the level of attitude among elderly population in urban area majority 36(60%) had Positive attitude and 14(23.33%) Favourable attitude only10 (16.66%) Negative attitude of elderly population in urban area.

SECTION – IV.A Practice regarding diabetes mellitus among elderly population in urban area.n-60

Levels of attitude	Frequency	Percentage
Poor practice	13	21.66%
Moderate practice	15	25%
Good practice	32	53.33%
Total	60	100%

The distribution of study subjects according to the level of practice among elderly population in urban area 32 (53.33%) had good practice and 15 (25%) Moderate practice only13 (21.66%) of elderly had poor practice.

SECTION – IV.B Practice regarding hypertension among elderly population in urban area.

n=60

Levels of attitude	Frequency	Percentage
Poor practice	10	16.66%
Moderate practice	14	23.33%
Good practice	36	60%
Total	60	100%

The distribution of study subjects according to the level of practice among elderly population in urban area 36 (60%) had good practice and 14 (23.33%) Moderate practice only 10 (16.66%) of elderly had poor practice.

SECTION – V CORRELATION BETWEEN KNOWLEDGE, ATTITUDE AND PRACTICE SCORES.

Knowledge	Attitude	Karl Pearson's coefficient of correlation.
13.9	31.9	0.48
Knowledge	Practice	
12.8	30.7	0.46
Attitude	Practice	
09.3	12.4	0.11

Reveals that $r = 0.48, 0.46(0 < r < +1)$, hence there was moderately positive correlation between knowledge and attitude, Knowledge and practice since there was positive correlation research hypotheses is accepted. Negative correlation between Attitude and practice research hypothesis is rejected.

SECTION - VI Chi-Square Knowledge, Attitude and Practice Values Elderly According to Their Selected Personal Variables.

Chi square value is significant between Level of knowledge attitude and Practice regarding Diabetic mellitus among elderly population in urban area. With personal variables there was significant association among the like educational status, type of family; exercise and rest all were not significant at 0.05 levels.

Chi square value is significant between Level of knowledge attitude and Practice regarding hypertension among elderly population in urban area. With personal variables like age, occupation, type of family, diet and rest all were not significant at 0.05 levels. Therefore, the finding rejects the null hypothesis and accepts the research hypothesis.

NURSING IMPLICATION

Recommendations:

The following suggestions must be made based on the findings of this study:

- A similar study on the influence of the IEC package on high blood sugar and blood pressure levels may be conducted.
- On a similar topic, a retrospective study may be conducted to identify the risk variables.
- For better outcomes, comparison research may be undertaken to control each success of video teaching as-well-as pamphlet teaching in the same environment.
- Other intervention techniques can be used to perform a similar evaluative research study.

CONCLUSION: -The study's major goal was assessing the health care on knowledge, attitude and practice (KAP) regarding diabetes mellitus and hypertension focused on elderly population in urban regions. The level of diabetes mellitus among elderly population in urban area majority 48(80%) had moderate knowledge and the level of knowledge in hypertension among elderly population in urban area majority 51(85%) had moderate knowledge. Level of diabetes mellitus among elderly population in urban area majority 34(53.33%) had positive attitude and level of attitude in hypertension among elderly population in urban area majority 36(60%) had Positive attitude. Level of practice among elderly population in urban area 36(60%) had good practice.

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Synthesis and IR vibrational properties of Metal Chelate of Nickel with 2-amino-1,4-naphthoquinone 1-oxime

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Abstract:-The 2-amino-1,4-naphthoquinone 1-oxime nickel chelate was synthesized using Nickel Sulphate and 2-amino-1,4-naphthoquinone 1-oxime. Gaussian og program is used for measuring the number of Ni chelate vibration waves with 2-amino-1,4-naphthoquinone 1-oxime. Gaussian og software is used for measuring the number of Ni chelate vibration waves with 2-amino-1,4-naphthoquinone 1-oxime. The experimental values are compared with Gaussian og software code using RHF / SDD base set and IR data. This records the predicted intensities of the infrared and Raman activities. The calculated frequencies agree with experimental values in good condition. The geometrical parameters calculated will also be given. The research is being expanded to measure the energy difference between HUMO and LUMO. Potential for ionization (I) electrical affinity (a) global hardness (sometimes), chemical potential (μ) and global electrophilicity (sometimes). The determined HOMO-LUMO energies show the transfer of charge occurs in the molecule. Optimized title compound geometric parameters are in accord with similar reported structure.

Keywords:- 2-amino-1,4-naphthoquinone 1-oxime, IR, HF, Energy gap.

Introduction:-Coordination of the compound chemistry has a number of developmental disciplines. These new compounds have application in biology. The quinone and amine group used for chelating ligand in the field of chemistry coordination and metal complex requirement has been of immense interest for so many years. Chelates made from quinone and amine metals are biologically active. (1). Naphthoquinone is widely distributed in nature, and plays a vital role in some cellular functions. Because of the large variety of geometries of coordination, numbers and types of interaction with the complexes of their ligands metals or generally chelate give access to various fields of pathways, in the treatment of cancer than the organic compound. The discovery of Cisplatin's anticancer properties was a landmark event in relation to interest in metal complexes (2). IR and UV are tested for structure of 2-amino-1,4-naphthoquinone 1-oxime. It gives a good relationship between calculated theoretical IR wave numbers and observed values for mid far IR data.

This paper describes the synthesis and vibrational spectrum of 2-amino-1, 4-naphthoquinone 1-oxime Ni chelate, determined by base set HF, data is compared with experimental values, geometric parameters, mulliken atomic charges, and chelate energy gap HOMO-LUMO.

Material and methods

The ligand 2-amino-1,4-naphthoquinone 1-oxime is synthesized from 1, 4 naphthoquinone. 1,4 naphthoquinone is supplied by Fluca chemicals. A stock solution of Nickel sulphate $\text{NiSO}_4 \cdot 7\text{H}_2\text{O}$ (Make : Merck) is prepared by using AR grade chemicals. Dionized water is used during synthesis.

2.1.1: Synthesis of ligand 2-amino-1,4-naphthoquinone 1-oxime from 1,4 naphthoquinone.

1,4 naphthoquinone solution prepared with Tetrahydrofuran and water, further saturated Sodium Azide was added, which further acidify with glacial acetic acid and kept for about 5 hours under string. Solidify by evaporation to get 2-amino-1,4-naphthoquinone.

Synthesis of 2-amino-1, 4-naphthquinone 1-oxime :-To 2-amino-1,4-naphthoquinone in NaOH solution, hydroxyl amine hydrochloride solution was added; which further heated with stirring for about 1 hour at 50-60⁰C. Solution was cooled in the ice bath, Acidify with dilute Hydrochloric acid to get brown precipitate of 2-amino-1,4-naphthoquinone 1-oime.

2.1.2: Synthesis of Ni chelate with 2-amino-1,4-naphthoquinone 1-oxime:-The chelate was prepared by combining in a ratio of 2:1 the ligand solution and the metal salt. Dissolving in methanol prepared the ligand solution, and the metal solution was prepared by dissolving in water to form a liquid solution. Slowly metal solution was added to the ligand solution under reflux at around 60-700C. Solution pH was maintained by dilute ammonia solution in between 5-6. The solution had been heated to magnetic stirrer under reflux for three hours. Cooled and filtered further solution to get colored compound.

2.2 Instrumental analysis :-IR spectra recorded in KBr matrix with range 4000-400cm⁻¹ UV spectra on Perkin Elmer instrument was recorded in solvent DMSO on Shimadzu instrument.

2.2.1 Computational details :-In the present work performed at Hartree-Fock CHF / SDD base set in Gaussian og software code, the calculation was carried out. At Hartree-Fock, the geometrics were first determined to use the SDD basis set (3, 4). The theoretically determined wave number value includes proven systematic error due to the incompetence in the correlation of electrons. The 0.9393 scaling factor value is used for setting HF / SDD basis. In the calculated vibration spectrum, the absence of imaginary value number confirms that the structure corresponds to the minimum energy. The energy distance between HOMO-LUMO and other related molecular parameters is determined. (5)

Results and discussion: -The IR frequency of absorption of chelate is analyzed for characteristic modes of hydroxyl, carbonyl, C = N, N-O, and Ni-O vibration. The calculated IR vibrational wave number with intensity is used to unambiguously classify modes. Table-I provided the harmonic vibrational frequency measured for chelate at HF using SDD basis package. It should be remembered that measured effects are the frequency of harmonics while the observed frequency often includes unharmonic contribution. Due to anharmonic relation between the measured and the observed vibration spectra, the value of the wave number is lower than the shape, which allows us to stand the observed spectral frequency underneath.

Table-1: Infrared wave numbers of chelate

Sr. no.:	Cald. Cm ⁻¹	Intensity	Raman activity	Exp. cm ⁻¹	Int.	Assignment
1	79.55	13.04	7.48	-	-	N-H B
2	104.37	1.72	5.24	-	-	N-H B
3	114.63	12.94	39.78	-	-	C-H B
4	147.34	20.48	76.89	-	-	C-H B
5	156.30	24.32	14.37	-	-	N-H B
6	196.67	61.95	11.55	-	-	N-H B
7	212.91	10.87	11.66	-	-	N-H B
8	227.61	19.21	63.52	-	-	C-H B
9	266.96	16.84	164.58	-	-	C-H B
10	303.02	1.25	4.15	-	-	O-N B
11	313.16	1.41	30.27	-	-	N-H B
12	324.83	6.20	22.17	-	-	C=O B
13	355.52	72.03	45.24	-	-	N-H B
14	369.46	6.25	5.61	-	-	C-H B
15	379.57	19.61	43.51	-	-	N-H B
16	390.20	20.15	99.82	-	-	C=O B

17	411.16	0.98	4.22	-	-	C-H B
18	413.03	6.86	0.84	-	-	C-H B
19	435.30	26.43	64.92	-	-	C-H B, N-H B
20	474.61	16.55	15.86	-	-	C-H B
21	484.87	43.18	59.40	-	-	N-O B
22	492.02	168.67	291.23	-	-	N-H B
23	500.93	12.43	3.27	500.83	92.02	C-H B
24	503.75	46.73	107.08	506.86	94.10	C-H B, N-H B
25	535.18	105.29	22.04	-	-	Ni-O B
26	542.25	9.14	35.79	552.40	95.98	C-H B
27	572.75	5.78	12.36	576.74	87.23	N-H B
28	610.58	104.40	1.27	620.06	86.45	C=O B
29	622.39	24.66	35.81	-	-	N-H B
30	629.55	18.51	17.43	-	-	C-H B
31	660.05	0.93	7.40	-	-	Ni-O S
32	665.76	8.59	13.63	664.85	78.35	C-H B
33	666.36	1.02	13.38	670.00	81.84	C-H B
34	692.34	24.82	23.37	685.50	66.21	C-H B
35	693.47	8.00	9.20	700.56	83.25	C-H B
36	723.45	34.30	26.32	-	-	C-H B, N-H B
37	730.01	9.00	120.65	729.52	63.08	Ni-O S
38	745.59	72.15	5.10	-	-	C-H B
39	747.14	55.37	1.87	750.31	81.72	C-H B
40	775.28	16.25	0.30	767.18	71.86	C-H B
41	775.90	9.34	6.03	-	-	C-H B
42	784.08	9.21	55.81	-	-	C-H B, N-H B
43	788.18	1.37	26.42	793.05	80.30	N-O B
44	800.73	17.40	55.26	801.40	76.56	N-H B
45	835.93	39.49	20.10	814.11	80.42	N-H B
46	848.57	39.82	56.98	845.07	56.31	C-H B, N-H B
47	858.45	11.68	10.78	861.86	78.26	C-H B
48	879.61	30.05	13.11	870.11	76.22	C-H B
49	905.59	10.94	0.72	894.19	77.44	C-H B
50	908.99	1.74	0.56	-	-	C-H B
51	949.67	29.73	4.71	950.25	93.34	C-N S
52	968.16	131.40	102.84	973.32	89.88	N-O S
53	981.43	26.47	188.93	986.51	92.56	N-O S
54	989.40	3.25	1.17	-	-	C-H B
55	995.23	1.06	3.25	-	-	C-H B
56	1002.54	37.66	34.55	-	-	N-H B
57	1007.73	0.59	0.56	-	-	C-H B
58	1013.40	0.25	0.08	1018.95	82.55	C-H B
59	1036.00	53.78	23.19	1039.17	87.27	N-O S
60	1056.82	79.34	330.10	1055.43	86.95	N-O S
61	1068.93	6.66	79.99	-	-	C-H B
62	1069.56	33.45	24.45	1093.81	82.24	C-H B
63	1111.34	1.53	30.00	1120.16	89.20	N-H B
64	1130.68	0.48	17.05	-	-	C-H B
65	1134.70	1.89	52.35	1148.99	64.98	C-H B
66	1174.95	53.27	192.70	1176.02	85.75	C-H B
67	1180.59	1.08	21.15	-	-	C-H B
68	1180.74	10.94	16.87	-	-	C-H B
69	1196.13	13.72	128.92	-	-	C-H B
70	1213.40	3.55	25.74	-	-	C=C S
71	1238.89	4.55	22.38	1229.97	64.50	C-N S
72	1282.58	15.29	18.42	1279.93	39.20	C-H B
73	1285.54	14.35	21.44	-	-	C-H B
74	1344.61	17.97	33.49	-	-	C-H B
75	1355.28	27.84	5.56	1352.73	74.92	C-H B
76	1427.60	151.82	86.86	-	-	C=C S
77	1428.15	74.74	38.38	-	-	C=C S
78	1426.20	85.90	96.60	-	-	C-H B
79	1448.81	40.05	153.71	-	-	C=C S
80	1452.38	11.28	33.19	1452.55	63.72	C=C S
81	1468.21	31.96	247.44	1462.37	66.21	C=C S
82	1505.92	45.83	690.83	1488.46	69.80	C=N S

83	1507.07	33.94	227.50	-	-	C=C S
84	1537.95	442.76	316.74	-	-	C=C S
85	1545.00	135.48	805.93	1555.13	28.77	C=N S
86	1563.86	35.81	45.25	1570.79	48.18	N-H B
87	1606.68	54.02	332.26	1585.34	29.78	C=C S
88	1608.29	159.50	698.10	1608.81	60.82	C=C S
89	1632.56	79.91	95.09	1632.54	44.19	N-H B
90	1637.10	24.81	85.46	-	-	C=C S
91	1637.81	14.31	278.85	-	-	C=C S
92	1669.99	37.46	131.75	-	-	C=O S
93	1672.23	51.30	158.80	-	-	C=O S
94	1714.55	290.60	584.55	-	-	C=O S
95	1716.62	67.77	244.80	-	-	C=C S
96	1734.62	88.74	118.12	-	-	C=C S
97	1738.84	107.40	59.96	-	-	C=C S
98	3356.23	5.74	54.19	-	-	C-H S
99	3358.19	4.64	52.82	-	-	C-H S
100	3369.64	15.26	42.52	-	-	C-H S
101	3372.22	7.33	51.45	-	-	C-H S
102	3373.92	5.29	103.27	-	-	C-H S
103	3379.71	2.34	52.49	-	-	C-H S
104	3380.40	1.37	58.51	-	-	C-H S
105	3382.25	0.18	36.35	-	-	C-H S
106	3391.65	29.00	374.81	-	-	C-H S
107	3393.10	23.94	310.60	-	-	C-H S
108	3698.74	26.57	57.20	-	-	N-H S
109	3724.93	27.06	181.74	-	-	N-H S
110	3827.52	34.05	47.76	-	-	N-H S
111	3862.57	42.25	14.02	-	-	N-H S

B: Bending, S: Stretching

Interpretation:

C-H vibration frequencies:-The structure of naphthalene shows the presence of structural vibration in the 3250-2950 cm^{-1} region, which is characteristic for the zero identification of C-H stretching vibration. The area 3250-3100 cm^{-1} is for symmetric stretching and for asymmetric stretching mode of vibration 3100-2950 cm^{-1} (6).

The naphtholic C-H vibration absorption bands are usually weak and it is too weak for detection, in most of cases. In present work, chelate of Ni and 2-amino-1,4-naphthoquinone 1-oxime the FTIR band is observed at 3356 cm^{-1} to 3393 cm^{-1} have assign as stretching vibration. The predicted absorption at 3356, 3358, 3359, 3372, 3373, 3379, 3380, 3382, 3391, 3393 cm^{-1}

Ni-2-amino-1,4-naphthoquinone 1-oxime has C-H out of plan and in the plan binding vibration. Out of plan blending mode of C-H vibration of titled compound is predicted as 114-147, 227-266, 369, 411-474, 492, 503, 542, 629, 665-723, 745-784, 848-908, 989, 995, 1007-1013, 1068, 1069, 1130-1196, 1282-1355, 1426 cm^{-1} and experimental value found at 418, 664, 670, 685, 700, 750, 767, 861, 870, 894, 1018, 1093, 1148, 1176, 1279, 1352 cm^{-1} . These frequencies are matches with experimental and predicted data.

C=N Vibrations:

HF/SDD level predicted IR frequencies at 949, 1238, 1505, 1545 cm^{-1} and experimental values found at 950, 1229, 1488, 1555 cm^{-1} .

N-O vibration: -HF/SDD level predicted IR frequencies at 303, 484, 788, 968, 981, 1036, 1056 cm^{-1} and experimental values found at 793, 973, 986, 1039, 1055 cm^{-1} .

Ni-N vibration:

HF/SDD level predicted IR frequencies are at 535 cm^{-1} .

Ni-O vibration : -IR absorption frequencies of Ni-O stretching is predicted at 660, 730 cm^{-1} with HF level and experimental IR frequency found at 729 cm^{-1} .

C=O vibration :-The experimental values of IR frequencies of C=O is found at 620 cm^{-1} . and HF/SDD level predicted IR frequency at 324, 390, 610, 1669 to 1714 cm^{-1} .

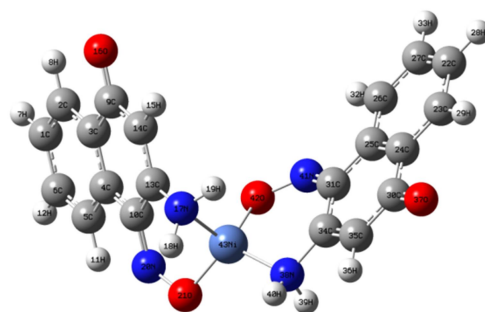


Fig-1: Molecular structure of Ni chelate with 2-amino-1,4-naphthoquinone 1-oxime Ni(ANQO)₂.

Molecular geometry:-The optimized Ni(ANQO)₂ structure parameters determined by ab initio, HF / SDD base set are described in Table-2 according to the atom numbering scheme shown in fig-1. Table-2 displays the values of bond length in degree in A₀, bond angle and dihedral angle.

Table no. 2: Bond length and bond angle and Dihedral angle of Ni(ANQO)₂ .

Bond	Bond length A ⁰	Bond	Bond angle ⁰	Bond	Bond angle ⁰
C1 C2	1.405	H8 C2 C3	119.97	H8 C2 C3 C9	-0.15
C2 C3	1.402	C3 C9 O16	119.92	C3 C9 O16 C14	179.86
C9 O16	1.258	C4 C10 N20	115.84	C14 C13 N17 H19	-45.90
C10 N20	1.325	C13 C10 N20	125.32	O42 Ni43 N17 H18	171.35
C10 C13	1.443	N20 O21 Ni43	104.66	N41 O42 Ni43 N38	-30.58
Ni43 N17	1.836	N17 Ni43 O42	111.13	C10 N20 O21 Ni43	-23.03
Ni43 O21	1.781	Ni43 O42 N41	112.84	O41 Ni43 O42 N17	115.00
N17 H18	1.000	N17 Ni43 O21	102.72	Ni43 O42 N41 C31	-0.71
C14 H15	1.070	C34 C31 N41	124.90	-	-

Mulliken charges arise from the Mulliken population analysis (7, 8) and provide a means of estimating partial atomic charges from computational chemistry methods, especially those based on a linear combination of the molecular orbital atomic process, and are routinely used as variables in QSAR linear regression procedures (9). The calculation of efficient atomic charges plays an important role in the application of the quantum mechanical equation to the molecular system. In the two separate mechanical methods, the electron distribution of Cd metal chelate with 2-amino-1,4-naphthoquinone is compared and the sensitivity of the measured charges to be charged is studied in the choice of methods. The Mulliken charges are determined by DFT / SDD, by determining the electron population of each atom in the given base function. The results are shown in Table 3 which display the atomic charging values of each atom of the molecule concerned (9).

Table-3:- Mulliken Atomic Charges of metal chelate Cd with 2-amino-1,4-naphthoquinone

Sr. no.	Atom	Atomic charge	Sr. no.	Atom	Atomic charge
1	1C	-0.223344	27	27C	-0.229542
2	2C	-0.384687	28	28H	+0.238654
3	3C	+0.234891	29	29H	+0.292160
4	4C	+0.301841	30	30C	-0.017493
5	5C	-0.360715	31	31C	-0.048797
6	6C	-0.234322	32	32H	+0.299641
7	7H	+0.236349	33	33H	+0.239383
8	8H	+0.290754	34	34C	+0.396072
9	9C	-0.012044	35	35C	-0.564664
10	10C	+0.075067	36	36H	+0.264350
11	11H	+0.287602	37	37O	-0.272608
12	12H	+0.235408	38	38N	-0.778897
13	13C	+0.402728	39	39A	+0.391990
14	14C	-0.580031	40	40H	+0.360722
15	15H	+0.265928	41	41N	+0.017515
16	16O	-0.274970	42	42O	-0.340715
17	17N	-0.729641	43	43Ni	+0.141320
18	18H	+0.402717	-	-	-
19	19H	+0.392917	-	-	-
20	20N	+0.048407	-	-	-
21	21O	-0.352163	-	-	-
22	22C	-0.221388	-	-	-
23	23C	-0.382997	-	-	-
24	24C	+0.236241	-	-	-
25	25C	+0.321605	-	-	-
26	26C	-0.365799	-	-	-

HOMO-LUMO energy gap and related molecular properties:-The HOMO-LUMO energy gap of the molecule 2-amino-1,4-naphthoquinone 1-oxime in the DFT and SDD base set has been calculated. The energy gap between HOMO and LUMO is constant in both methods. It is known that the value of E HOMO is often associated with the ability of an electron to donate an inhibitor molecule, and higher values of E HOMO are an indication of greater ease in donating electrons to an unoccupied orbital of the receptor. E LUMO 's value is related to the molecule's ability to accept electrons; lower E LUMO values suggest the receptor can accept electrons. Consequently, the Egap value provides a metric for the stability on the metal surface of the orimated complex. Using HOMO and LUMO energies AS $I = -E \text{ HOMO}$, $A = -E \text{ LUMO}$, the structure function of SCF MO theory, ionization energy and electron affinity can be expressed. The hardness is compounded by the difference between the orbital energies HOMO and LUMO. When the strength of the distance is greater than that of the Hardness is also greater. Global longevity $\pi = 1/2 (E \text{ HOMO} - E \text{ LUMO})$ The hardness is correlated with the stability of chemical potential (μ) which can be expressed in combination with the potential for electron affinity and ionization. The global index of electrophilicity is also determined and described in table-4.

Table No: - 4 Comparison of HOMO-LUMO, Energy gap and related Molecular Properties of Metal chelate Cd with 2-amino-1,4-naphthoquinone 1-oxime.

Molecular Properties	DFT
HOMO eV	+0.00817
LUMO eV	-0.01036
Energy gap	0.01853
Ionisation Potential (I)	-0.00817
Electron Affinity(A)	+0.01036
Global Hardness (η)	0.009265
Chemical Potential (μ)	0.001095
Global Electrophilicity (ω)	0.0046325

Thermodynamic properties:-Several thermodynamic parameters are determined and presented in Table-5 based on vibrational analysis at B3LYP / SDD level. To the degree of precision, the zero point vibration energy (ZPVE) and the entropy, S_{vib} (T) are measured and the variations in ZPVE tend to be negligible. Total energy and change in total entropy of 2-amino,3-chloro 1,4-naphthoquinone at room temperature in different methods is only marginal.

Table 5 Theoretically computed Energies (a.u.), Zero point Energy (Kcal / mol) Rotational Constants (GHz), Entropy (cal mlo -1 K -1) and Dipole moment D (Kcal. mlo -1 K -1)

Parameter	DFT/B3LYP/SDD
Total Energy e.u	-1459.32 a.u.
Zero Point Energy	197.123 Kcal/mole Kcal/mole
Rotational constants	0.32893 0.09112 0.07921
Entropy Total	198.48812
Translational	46.080 kcal/mole
Rotational	36.158 kcal/mole
Vibrational	47.902
Dipole movement (D)	4.1724 Debye

IV Conclusions:-This ligand has four donating atoms that are useful for various biological reactions. The measured vibration rates are correlated with experimental data and are found to be in strong agreement with others. The assignments have been confirmed with the help of the animation process, which is available in Gaussian 09 computer code. Metal chelate Cd molecular geometry with 2-amino-1,4-naphthoquinone 1-oxime is best at DFT / SDD level. The energy of HOMO-LUMO was calculated and other related molecular properties were also discussed. The nuclear charges of the Mullika have been calculated and the results discussed. Thermodynamic parameters have been calculated. The atomic charges of the Mullikan have been calculated and the results discussed. Thermodynamic parameters have been calculated.

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A STUDY TO ASSESS THE KNOWLEDGE REGARDING NOSOCOMIAL INFECTION AMONG STAFF NURSES IN BHAGYDAY TIRTH CHARITABLE HOSPITAL, SAGAR (MP).

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ABSTRACT:- Nosocomial death rate in India peaking in day by day. Here used A pre-experimental one group pre-test and post-test research design. In this study selected 20 sample from Bhagyoday Tirth Charitable hospital in Madhya Pradesh to assess the knowledge regarding nosocomial infection among staff nurse. For that I have used purposive sampling techniques. Structured questionnaires included for collecting data this help to reveals the knowledge score of the individual regard nosocomial infection. The result shows that effectiveness of planned teaching programme was high. Pretest Mean, and SD, like 10.55+-1.45 respectively for posttest 16.45+-3.19 and mean percentage of difference between pre and post knowledge score regarding nosocomial infection is too high which was 34.72%. This confirmed that the study is effective. These scores significantly associated with family type, residence, education, annual income and past knowledge about multiple drug resistant tuber culosis.

KEYWORDS:- Nosocomial Infection, Bacteria, Hand washing, Prevention

INTRODUCTION:- Nosocomial infection is also called as hospital acquired infection. It is derived from the Greek word nosocomial meaning hospital or hospitalization. It can be defined as an infection whose development is favoured by hospital environment, mainly within 48 hours after admission. Nosocomial infections are important contributors for morbidity and mortality. They become more important in public health problem. "Hospital is the place for cure" – this comes to our mind when we think about the hospital. Treating the patients under same roof was considered as a revolutionary idea, and was expected that it will ease the job of healing. But it turned wrong in Pre Listerian era because of lack of knowledge on sterilization and antisepsis. Gangrene and death were almost mandatory for the patients suffering from wounds. Nosocomial infection other names (Healthcare-Associated Infections) Contaminated surfaces increase cross-transmission. Surfaces increase cross-transmission Specialty Infectious disease. In the United States, the Centers for Disease Control and Prevention estimated that roughly 1.7 million Healthcare-Associated infections, from all types of microorganisms, including bacteria and fungi combined, cause or contribute to 99,000 deaths each year. Nosocomial infection occurs worldwide and effect both developed and developing countries. Infections acquired in health care settings are a significant burden both for the patient and for public health.

STATEMENT OF PROBLEM:-A STUDY TO ASSESS THE KNOWLEDGE REGARDING NOSOCOMIAL INFECTION AMONG STAFF NURSE IN BHAGYDAY TIRTH CHARITABLE HOSPITAL, SAGAR (MP)

OBJECTIVES: -

- 1 To assess the knowledge of staff nurses regarding prevention of nosocomial infection before structural teaching program.
2. To assess the effectiveness of a structured teaching program on knowledge regarding nosocomial infection among staff nurses.
3. To determine the association between pretest knowledge score on nosocomial infection with selected demographic variable.

HYPOTHESIS: -

H0- There will not any significant difference between post-test knowledge regarding the prevention of nosocomial infection among staff nurses in hospital

H1- There will be significant difference between pre and post-test knowledge regarding the prevention of nosocomial infection among staff nurses in hospital.

H2- There will be significant association between pre-test knowledge regarding nosocomial infection among staff nurse with selective demographic variable.

H3- There will be significant effectiveness of structural teaching programme on prevention of nosocomial infection among staff nurses in hospital.

RESEARCH METHODOLOGY

1. RESEARCH APPROACH –

A pre-experimental one group pre-test and post-test research design was adopted for this study

2. RESEARCH DESIGN –

Purposive research design

Purposively selected staff nurse	P1	X	P2
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P1-Pre test on knowledge regarding nosocomial infection among staff nurse in bhagyday tirth charitable hospital X-Implementation of structured teaching programme on nosocomial infection

P2- post test on knowledge regarding nosocomial infection among staff nurse in bhagyday tirth charitable hospital

SETTING OF THE STUDY- The study setting was the clinical environment of a Bhagyoday tirth charitable hospital in Sagar which consist of general wards, high- risk multi drug resistance, surgical ward, gynaecology, post-natal, maternity, special baby care unit, intensive care unit, casualty, outpatient, theatre, orthopaedic unit.

Setting is a physical location in which data collection takes place in a study the study was conducted in B.T.C.H. Sagar M.P. the nurses working in medical ward , surgical ward , pediatric ward , ICU and isolation ward , were selected for the study

SAMPLE –The sample consist of population of registered staff nurses selected to participate in research study those are working in B.T.C.H.

SAMPLING TECHNIQUE–In this study, a purposive sampling method through non – probability sampling approach was used for selection of nurses.

SAMPLE SIZE-In this study, 20 staff nurses are selected from different ward like medical ward , surgical ward ,pediatric ward ,ICU and isolation ward of B.T.C.H. Sagar M.P.

DEVELOPMENT OF TOOL–A structured knowledge questionnaire was prepared to assess knowledge of staff nurses regarding prevention of nosocomial infection.

The steps carried out in preparing the tools are:

Description of tool–In this study, the tool consists of two parts :

1.Part I – It consisted of 5 items related to demographic variable of the subjects such as age ,gender , professional education qualification , clinical experience , in service education .

2.Part II – Structured knowledge questionnaire consisted of 20 items on knowledge of the staff nurses regarding the prevention of nosocomial infection in hospital.

➤ Scoring of the items – Each items of the questionnaire has one correct answer, every correct answer would fetch one mark, and the tool scores of the knowledge questionnaires is 20 .

Level of knowledge	Score	Percentage
Inadequate	0-10	0-50%
Average	11-15	51-75%
Adequate	16-20	76-100%

DATA COLLECTION PROCEDURE-After obtaining permission from principal and administer of the hospital B.T.C.H. oral consent was obtained from all the staff nurses. The investigator-initiated contact with staff nurses by introducing her and then explained the purpose of the study to ascertain the willingness and co-operation of the participants. The respondents were assured of the anonymity and confidentiality of the information provided by them. Pre-test was conducted prior to teaching programme on first day. Administer the teaching programme to the staff nurses regarding the prevention of nosocomial infection structural teaching programme. After 7 days post test was conducted to assess the effectiveness of teaching programme.

DATA ANALYSIS AND INTERPRETATION

SECTION A: Description of samples according to their demographic characteristics.

S.NO	DEMOGRAPHIC VARIABLES	FREQUENCY	PERCENTAGE%
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1	AGE: -		
	21-25 YEAR 26—30 year >35	12 06 2	60% 30% 10%
2	GENDER: -		
	Male female	2 18	10% 90%
3	Professional qualification		
	B.sc nursing GNM ANM M.sc Nursing	10 9 1	50% 45% 5%
4	CLINICAL EXPERIENCE		
	0-2 year 2-4 year More than 5 years	14 4 2	70% 20% 10%
5	INSERVICE EDUCATION		
	Not attended Attended within month Attended within 6 months Attended within 1 year	11 5 1 3	55% 25% 5% 15%

SECTION -B

Asses the level of knowledge regarding prevention of nosocomial infection among staff nurses in BTCH.

Table 5.1 Distribution of sample according to pre-test level of knowledge.

Level of knowledge	Frequency (pre-test)	Mean score (pre-test)	Frequency post- test	Mean score (posttest)
Inadequate	2	10%	0	0%
Moderate	17	85%	1	5%
Adequate	1	5%	19	95%

Assess the effectiveness of structured teaching programme on Knowledge regarding prevention of Nosocomial infection among staff nurses in B.T.C.H.

Knowledge level	Mean score	mean percentage	Difference mean percentage	Standard deviation
Pre-test	10.55	50.52	34.72	1.45
Post-test	16.70	85.24		3.19

Table 5.5. Mean score, S standard deviation , Mean percentage mean difference of pre test and post test scores of staff nurses

SECTION – C - Association between the pre test scores with demographic variables

S.no	Demographio variable	Inadequte		Moderate		Adequate		Chi-square
		N	%	N	%	N	%	
1.	Age	2	10%	9	45%	1	5%	2.33 P<0.05 NS
	2 1-25	0	0	6	30%	0	0	
	26-30	0	0	2	10%	0	0	
	>31							
2.	Gender	0	0	2	10%	0	0	0.385 P<0.05 NS
	Male	2	10%	15	75%	1	5%	
3.	Professional qualification	2	10%	7	35%	1	5%	2.653 P<0.05 NS
	Bsc nursing	1	5%	8	40%	0	0	
	Gnm	0	0	1	5%	0	0	
	Anm	0	0	0	0	0	0	
4.	Clinical experience	2	10%	11	55%	1	5%	1.375 P<0.05 S
	0-2 year	0	0	4	20%	0	0	
	2-4 year	0	0	2	10%	0	0	
	More then 5 year							
5.	in service eclucation	1	5%	9	45%	1	5%	3.844 P<0.05 NS
	No attended	2	10%	4	20%	0	0	
	Attended with in 1 month	0	0	1	5%	0	0	
	Attended with in 6 month	0	0	2	10%	0	0	
	Attended with in 1 year							

Table 5.7. Chi -square value of association between the pre test scores

Chi square was calculated to find out the association between the pre test scores of staff nurses with their demographic variables (age, gender, of the family, professional qualifications, and attended or training in-service education program). Hence it can be interpreted that there is non-significant association between pre-tests scores of staff nurses with their demographic variables were only by chance not the true difference.

Conclusion:-The mean percentage of pre and post test score was 34.72%, therefore the planned teaching programme of knowledge regarding nosocomial infection among staff nurse in Bhagyday tirth charitable hospital, is adequate so the study is effective.

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The Study of increased Diabetes and Obesity due to Physical inactivity during Pandemic

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ABSTRACT:-Obesity is deteriorating the human's health which results in diabetes and other health issues. Diabetes is increasing rapidly with an alarming rate due to inactivity and eating habits by consuming unhealthy food. During covid-19 pandemic due to lockdown all the exercise centres were closed which impacted people with health issues due to inactivity. Increased number of working and desk work by sitting for long hours and working has caused hypertension in people resulting in obesity and overweight and many have fallen prey to diabetes and other diseases. In recent years it has been found that the younger generations are more likely to have an unhealthy lifestyle. Consuming fast food has increased by younger generations which are unhealthy as it contains preservatives which are bad for health. This study endeavors' to achieve an aspect of the physical inactivity and unhealthy lifestyle problem in Palghar district population. The focus of this study is to create social concerns among the young generation about the enormous lack of physical activities and consuming junk food everyday that could result in fat saturation and increase glucose level in blood and fall victim to diabetes. Primary data was collected by questionnaire above age 25 years in Palghar district only. There were 104 respondents who answered the questionnaire. After data analysis it was found that, the population with the age group of 25 years to 45 years are more prone to have diabetes in near future as they don't do any physical exercise and have unhealthy lifestyles.

KEY WORDS:-Diabetes, Exercise, Obesity, Work stress, physically active, Covid Pandemic

INTRODUCTION - During contemporary years physical activity has a major role for a healthy lifestyle, which can prevent humans from various diseases like diabetes, high blood pressure, cardiovascular diseases, obesity and other health issues. But due to long working hours and desk work jobs has caused a reduction in physical activity which has resulted in obesity and overweight. During the Covid-19 pandemic there was a tremendous increase in health issues of people because of inactivity. Due to lockdown the gym and jogging park were shut down. The results of physical inactivity due to work from home has caused immense increases in obesity and overweight which has resulted in diabetes and is increasing at an alarming rate. Physical inactivity of people due to lockdown has become a serious public health anxiety. Change in the work style and working hours has impacted work stress and has ill effects on health. Physical exercise plays an important role in improving the well-being of people and also reduces the chances of diabetes and other diseases which are at high risk for humans. Therefore it's important to be physically active which includes all movement that helps to increase the energy use, also helps in weight loss and maintain a healthy lifestyle. Regular physical activities like walking for at least 45 minutes every day and light stretching, yoga, gym exercise and aerobic exercise has to be done depending on the age and disease type. During the pandemic due to inactivity and also unhealthy eating habits has increased in younger generations causing obesity. Eating unhealthy

oily food which contains preservatives, fats and salts, fast food which is easy to cook and eat has grown larger in young generations and no physical activity due to covid-19 pandemic which have impacted young adults and adolescents which has risen in diabetes at alarming rate. A balanced diet should maintain a healthy living and also regular physical activities to improve the lifestyle. Work stress during a pandemic where people have to adapt to different work styles. A drastic change in work style has impacted people with hypertension causing illness. People working for longer hours on online desk work and no physical exercise has crucial effects on health causing obesity and being overweight and in future can fall ill with diabetes and other health problems. The aim of this research paper is to create social awareness among people to eat healthy and do regular exercise to stay fit and healthy to reduce the chances of falling prey to diabetes and other health problems. **Gene Tunney** quotes “To enjoy the glow of good health, you must exercise”. (Gene Tunney, 2021)

REVIEW OF LITERATURE

Physical Activity and Diabetes (Sigal R, Armstrong M. 2013) author states that physical activity should be regularly done by every individual to manage the glucose level in the body and improve overall health. The author has recommended physical activities for type-1 and type-2 diabetes patients. Exercises are necessary to improve the blood containing glucose and also other risk factors like cardiovascular and also helps to reduce weight and to have an active lifestyle. Regular exercise can obstruct or delay from getting type-1 and type-2 diabetes which will help in muscle building and improve cardiovascular fitness.

Healthy lifestyles in Europe: prevention of obesity and type II diabetes by diet and physical activity. (Public Health Nutrition, 4(2b), 499–515. Astrup, A. (2001)) in this the author states that obesity is increasing tremendously due to lifestyle of people and eating habits which has affected the young generation as they fall prey to diabetes at early age. The younger generation has a serious risk of cardiovascular disease and diabetes. The obesity and weight gain has increased the risk of diabetes with 80-95 % due to saturation of abdominal fats. Author recommends weight loss with a proper low fat healthy diet and exercises which can reduce risk of diabetes at an early age.

Hayes, C., & Kriska, A. (2008). Role of Physical Activity in Diabetes Management and Prevention in this journal the author reviews the purpose of the exercises due to increase in diabetes diagnosis in people. The author encourages people to do exercise to have a healthy lifestyle and prevent diabetes. Exercise has been a vital role. People are still inactive and have many side effects and are overweight. Obesity and overweight has caused a tremendous increase in diabetes which has caused concern of public health.

OBJECTIVES OF THE STUDY

1. To understand the consequence on the younger generation, the population incurs diabetes at an early age due to work stress and work from home during covid pandemic.
2. To suggest constructive measures inclining towards an unhealthy and physically inactive lifestyle during covid pandemic this results in various conditions like diabetes.
3. To create social awareness about the vital role of activity/exercise to prevent obesity during covid pandemic and falling prey to diabetes.

4. To analyze the increasing overweight and obesity due to eating unhealthy among adolescents and measures to prevent further risk of diabetes.

LIMITATION OF THE STUDY - In this research paper the study is limited to the district of Palghar in Maharashtra only during the time of pandemic. Therefore the discovery of the research cannot give broad-ranging scope to other regions. The limitation of the research was only based upon an unhealthy lifestyle and being physically inactive. Furthermore studies can be done based on the family history, types of diabetes and gestational diabetes to predict the population falling ill with diabetes. The study can be made broad by data mining using different techniques.

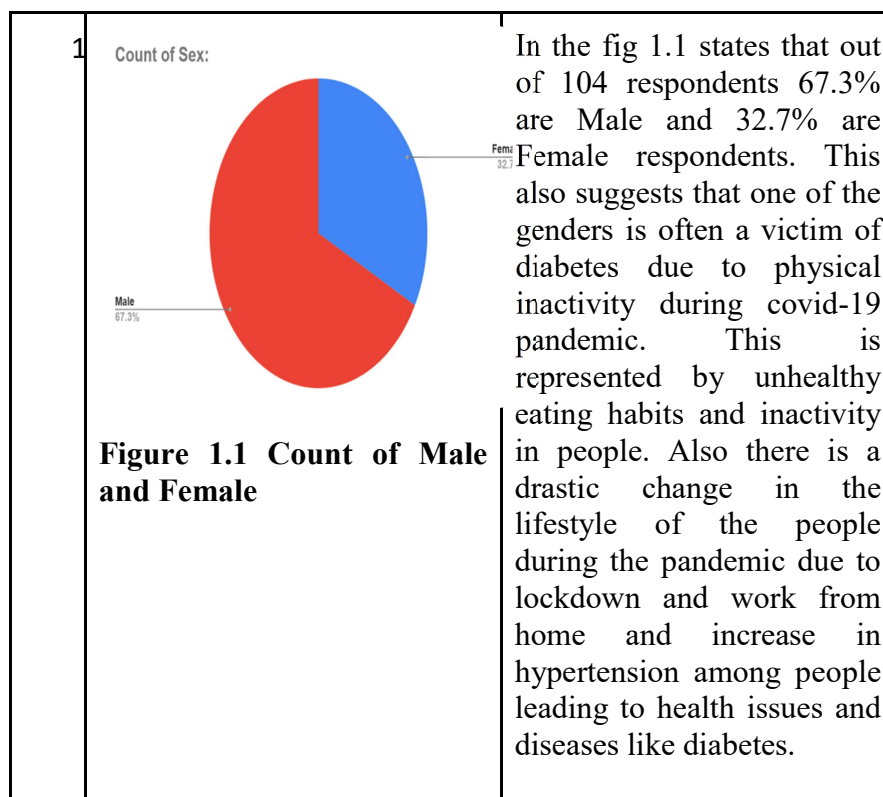
RESEARCH METHODOLOGY

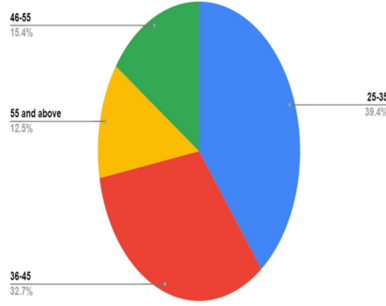
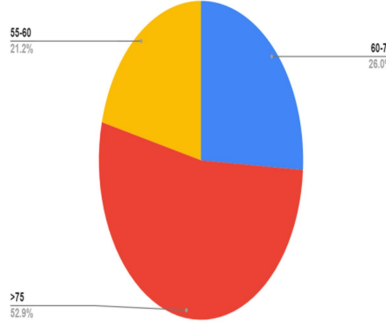
Data collection method:

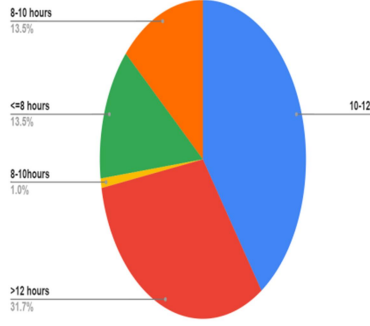
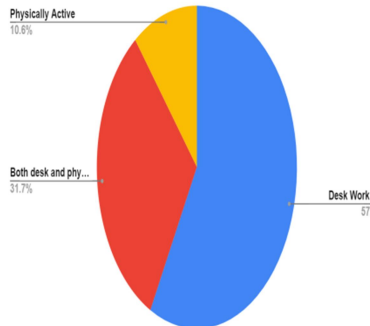
Primary data:- Primary data is collected through questionnaires, which was circulated amongst the common people aged above 25 years in Palghar region only. Total of 104 people responded to the questionnaire and the data collected was then analyzed. People from Palghar participated and gave their insights by filling in the ways of activities, work hours and lifestyle during covid pandemic. The sample size for the same is of 104 respondents from the area of Vasai-Palghar district only.

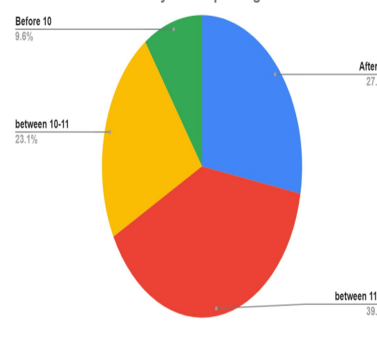
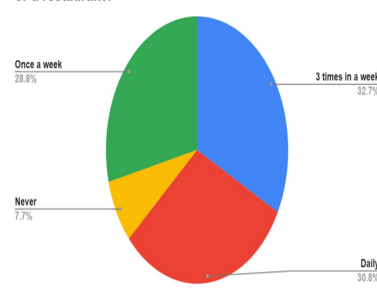
DATA ANALYSIS & INTERPRETATION

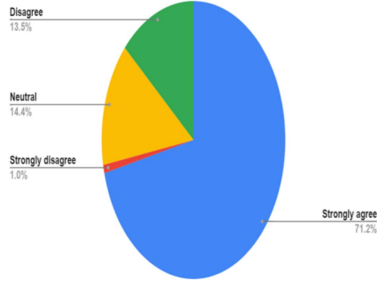
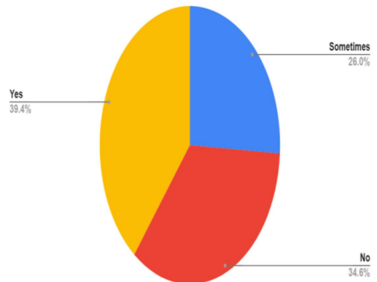
Survey of data collected through questionnaire:

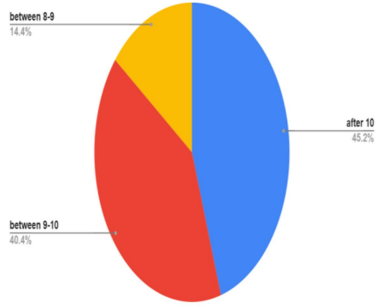
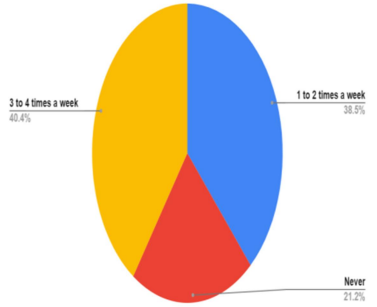


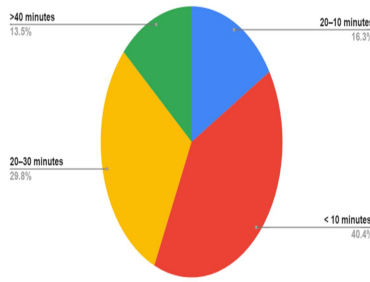
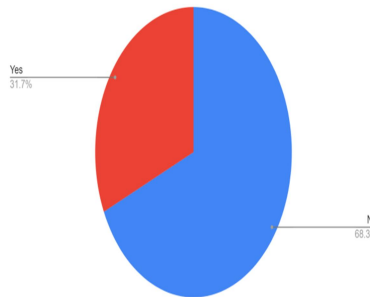
<p>2</p>	<p>Count of Age</p>  <p>Figure 1.2 Age Group</p>	<p>In the questionnaire the Age groups were divided into four categories and they are as follows: 25-35 years old, 36-45 years old, 46-55 years old and 55 and above. Fig 1.2 states that, 39.4% respondents with age group 25-35 years, 32.7% respondents with age group 36-45 years old, 15.4% respondents with age group 46-55 years and 12.5% respondents with age group 55 and above.</p>
<p>3</p>	<p>Count of Weight:</p>  <p>Figure 1.3 Weight</p>	<p>In the figure 1.3 states that most of the respondents are above 75 weight that is 52.9%. The pandemic lockdown has created measures of obesity and overweight in people due to no exercise and inactivity as all gym and yoga centres and jogging parks were closed. Due to this, people can get more prone to diabetes and other health issues.</p>

<p>4</p>	<p>Count of How many hours do you work per day.</p>  <p>Figure 1.4 Working Hours</p>	<p>The figure 1.4 states that the number of respondents working from work from home for above 12 hours is 31.7%, 10-12 hours is 40.4% and 8-10 hours is 13.5%. Therefore from the figure it is concluded that the number of people doing overtime is more than the usual time of their office hours which has impacted their physical activities, as they have no time for the activities. More working hours has resulted in health drawbacks and oberwright issues.</p>
<p>5</p>	<p>Count of What is your job work style.</p>  <p>Figure 1.5 Work Style</p>	<p>The figure 1.5 states that 57.7% of people work a desk work job and 31.7% of respondents' working style is both desks work and physically active. This concludes that more numbers are involved in desk work jobs, where physical activity is less like IT professionals, accountants and more. This has reduced physical activity and due to increased number of working hours and lockdown people are prone to illness and can have fallen prey to diabetes and other health issues. Therefore exercise should be done regularly to avoid weight gain .</p>

<p>6</p>	<p>Count of What time do you sleep at night.</p>  <p>Figure 1.6 Sleep Time</p>	<p>The figure states that respondents sleep after 12 o'clock is 27.9% and between 11 o'clock to 12 o'clock is 39.4%. From the fig it states that respondents are more prone to sleep late after 11 o'clock which is not good for health. Due to overtime of work, the respondents schedule gets late which is hazardous for health. People being night owls could damage your health and cause hypertension, high blood pressure, diabetes and cardiovascular diseases. To prevent diseases, sleeping early early could benefit your lifestyle.</p>
<p>7</p>	<p>Count of How often did you eat 'fast food' from a takeaway or a restaurant?</p>  <p>Figure 1. 7 Eating fast food from Takeaway</p>	<p>Fig 1.7 states that 30.8% of respondents eat Daily fast food from a takeaway or restaurants followed by 32,7% respondents eat 3 times in a week outside food. Food ordered from the restaurant contains sodium and artificial food colors which are bad for health. The Food contains a lot of calories and sweeteners which makes people obese and lack vitamins, if consumed daily will be harmful. Therefore, it is necessary to eat healthy home cooked food.</p>

<p>8</p>	<p>Count of Due to pandemic work from home is stressful and have to work overtime</p>  <p>Figure 1.8 Pandemic Work Stress</p>	<p>Figure 1.8 states that due to a drastic change in working style people were forced to change their way of working and learning new things had an impact of hypertension and illness among people. According to the survey 71.2% respondents strongly agreed that they were stressed during the pandemic due to change in work adoption to be done quickly which had impacted the stress level of people leading to illness and other diseases. Therefore yoga, meditation and exercise helps to reduce stress.</p>
<p>9</p>	<p>Count of Do you do physical exercises like Yoga, Stretching, jogging, walking, aerobics etc.</p>  <p>Figure 1.9 Physical Exercise</p>	<p>Figure 1.9 states that physical exercises like yoga, jogging etc. where 34.6% respondents answered “No” and 26% respondents answered “sometimes”. From this figure it concludes that there are many people who don't do physical exercise and passively work with no physical activity which can be dangerous for health in future and can cause obese and overweight and can also have major impact on physical and mental health problems. Awareness of physical exercise should be created to reduce future health issues.</p>

<p>1</p>	<p>Count of What time do you have dinner?</p>  <p>Figure 1.10 Dinner Timing</p>	<p>Figure 1.10 states that 45.2% respondents have dinner after 10 o'clock and 40.4% respondents eat between 9 to 10 o'clock. From this scenario it states that people are more prone to eat late, which has many bad effects on health. Eating late every day affects your body which will store calories as fat, which causes weight gain and also increases sugar levels. People should be aware that for good digestion and controlled sugar levels early dinner will benefit health.</p>
<p>1</p>	<p>Count of How many days do you exercise in a week?</p>  <p>Figure 1.11 Weekly Exercise count</p>	<p>Figure 1.11 states that respondents exercise as per weekly count is 38.5% exercise 1-2 times a week and 21.2% respondents never exercise in a week. From this survey it states that people have less physical activity which is a risk for health in future leading to increase in cases of cardiovascular diseases, diabetes at early age and other illnesses. Therefore it is necessary to regularly exercise daily to burn calories.</p>

<p>1</p>	<p>Count of How much time do you exercise for each session?</p>  <p>Figure 1.12 Exercise Duration</p>	<p>Fig 1.8 states that about 40.4% respondents exercise less than 10 minutes and 16.3% exercise for 10-20 minutes. From this diagram it states that less amount of time is dedicated to physical activity which does not help to burn calories. This can increase in fat saturation and weight gain and obese which is bad for health and lead to different illness. Therefore regular exercise for more than 40 minutes is essential for good health.</p>
<p>1</p>	<p>Count of Do you have Diabetes?</p>  <p>Figure 1.13 Diabetes count</p>	<p>Fig 1.9 states that out of 104 respondents 31.7% respondents are having diabetes. It states that from the above survey due to inactivity during pandemic has an increase in the diabetes. Furthermore, the number of diabetes patients can increase due to unhealthy lifestyle and inactivity in people. So people's awareness should be maintained to be healthy and exercise daily and to stay healthy.</p>

SUGGESTIONS AND RECOMMENDATIONS-In this article the data collected by questionnaire regarding inactiveness among people during the covid pandemic which has increased the obesity and diabetes illness. The questionnaire was only based on Palghar district which has given limited outcomes. More respondents' responses will be collected in future to get a broader view covering the Mumbai region. More information will be found out about the people's inactivity lifestyle and applying data mining techniques for the early prediction of diabetes, people falling prey to it at an early age and creating social awareness among people to be physically fit by exercising.

CONCLUSION - “You have to exercise, or at some point you’ll just break down.” Barack Obama, the quotes rightly say to exercise or at some point you will be broken and fallen prey to illness. As we know physical activity plays a very vital role for healthy living and well-being. Knowing the fact many people don't do physical activities like jogging, walking, yoga and other activities. From the survey it is concluded that people have faced problems of drastic change of lifestyle during the covid-19 pandemic. Lockdown has a major impact on health on a lot of people where all gyms, jogging parks and yoga centres were shut down which has caused no physical activity among people. Hypertension levels have caused major problems for people due to sudden change in working habits which have impacted health issues leading to many diseases. Eating late at night due to increase in working hours and no exercise has affected health as it can lead to saturation of fats. Unhealthy eating habits have increased in younger generations where packed food has become a trend which is easy to cook and eat. Pack and canned foods contain salts, preservatives and sodium which is dangerous for health if eaten regularly. Due to the pandemic people are working from home and a number of people’s working style is desk work, where work is done only by sitting on a computer or laptop where there is less physical activity. So people with desk jobs should adhere to regular exercise to prevent diseases and being overweight. It has also concluded that there are many people who don't exercise and some exercise less than 10 minutes as so on. It is important to exercise daily for more than 40 minutes to burn calories and stay healthy. Many people have fallen prey to diabetes and other diseases due to inactivity and need to prevent increasing numbers of patients especially the younger generations. So, according to the study early prevention among people, especially the younger generations should be done by eating healthy and physical activity for at least more than 40 minutes should be done. Therefore the aim is to make social awareness in the younger generation to prevent falling prey to diabetes in future and to build a healthy lifestyle.

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NEW SCIENCE & SPIRITUAL PRACTICES

**ROOPWATI SHARMA
PHD RESEARCH SCHOLAR**

ABSTRACT- New Science & the latest researches done by Doctors in the world's most A listed IV League Institutions, Neuroscientists, Meta-Physicist, Massive multi-national projects taken up by the scientific community and backed by some aware and socially responsible establishment & consciously aware educated community, have been working to establish the missing links between the Scientific foundation of spiritual practices. This research is a deep study into fact finding mission in various Scientific Journals, laboratory based studies and thousands of tests that simply establish the definite link in wisdom traditions, customs, rituals and the mindfulness practices on human mind, body, thoughts, families, societies, nations and the world as a one living organism that is united by global consciousness that Meta-Physicists call Global Unified field. In Indian Tradition there is an age old saying that " Vasudeva Kutumbhkumbh" it means that Universe is a one big family. This research is precisely pointing and nailing it down to this very statement with the help of work done by Scientist and some of them where Atheist or not practicing any spiritual practices but after their research findings they all became spiritual in some way or the other. This sneak-peak into the work done by scientific community and medical professionals and researchers will bring the light into very purpose humanity exist.

Key words: - Meditation, Unified Global Field, Consciousness, Global Consciousness, Energy, Divine Network, Happiness, Vibration, Frequency, Spirituality

INTRODUCTION:-In the age of information ignorance is a personal choice & a self-sabotaging decision. Human race is going through a fast pace transition from all aspects. Scientific fundamentals have changed and yet not incorporated in the modern education system globally. The change is rapid, and adaptation is slower. This is a challenge that Human Race must bridge simply with innate adoptability, resilience, patience, cognitive abilities and emotional strength. These are some of the competencies required in coming 25-30 years as per the report released by the "World Economic Forum 2020" The new science is based on the frequencies and vibrations. The new science proves that the space or environment. is not empty and it's full of information, energy, vibration at different frequencies. Radio waves, microwaves, Television frequencies, Settle-light frequencies all are part of the matrix where we are breathing air. The neuroscience has also proven that thoughts are things and drives energy. This energy transits in the field and gets connected with global unified filed and hence become a part of global information system. The potency of human mind and heart is been researched to affect the environmental markers that can be tracked with the gadgets. The heart brain coherence of collective human being can change the energy levels and cause social impact for humanly causes is sciences that now have become a technology. As per Maya Calendar this age is called the age of Aquarius meaning "Air" everything that is in air be it various air borne frequencies, laser treatments with lights or 2G, 3G, 4G and 5G connections. There is a greater network that holds the unified filed together and by maintaining certain vibrations and frequencies in human mind and body, scientifically now it's possible to hack the field and be more creative, innovative, and resourceful to change the human DNA & RNA through the science that is now known as epigenetic and Neuro-plasticity. This science co-insides with an ancient Indian proverb "Soch se Srishti Banti hai" (our thoughts create our reality) & Neuro-Linguistic Programming is a tool globally proven now to be the language that mind understands and ancient saints, gurus and

mystics knew already that was the source of the mantra given by Adi Shankra-charya “ Aham Brahmasmi” (we are the creator of our own destiny) Because thoughts drives actions and actions drives results. The art of managing the thoughts lies underneath the language we speak, and the art of living is how to hold self-conversations within. This is only learnt through self-awareness and can be mastered via meditation and mindfulness practices.

Need & the Purpose of the Study:-World Health Organisation report says that the world is sitting on the volcano of mental health. As per studies over 90% to 95% diseases are psychosomatic. Over 275 million people are only suffering from Anxiety as per WHO & that is over 4% of world population. Over 23 million people die due to mental health problems every year globally. The top listed Happiest Nations in the world are also among the top list of nations with highest suicide rates. The need for this research is to connect the scientific grounds for practicing spiritual lifestyle. The need is to establish Meditation as a human technology to achieve good health and over all wellbeing for human race.

Literature Review: -

- 1. The Global Consciousness Project.**Nelson, Roger. (2006).Explore (New York, N.Y.). 2. 342-51. 10.1016/j.explore.2006.05.012. **The Global Consciousness Project” IONS report 2020.** Princeton University was a part of this project on the universal connectivity of human souls at energetic levels can have possible positive and negative impact on the climate parameters i.e. resonance levels in the environment can increase or decrease based on the emotional positive or negative connect. The Global Consciousness Project is an international, multidisciplinary collaboration of scientists, engineers, artists, and others IONS Report (2020).
- 2. An Analysis of Global Consciousness Project. Author- Peter Amairic Bancel, An Institute of Metapsychique Paris, France. Year- 2014.** DOI10.13140/2.1.4183.33602. In Book: - Evidence for Psi: Thirteen Empirical Research Reports (pp.255-277) chapter:11. Publisher: -Mcfarland. The research was done to investigate the subtle connection between the collective mental activity of humans the physical behaviour of the systems in the surrounding environment. The model provides reliable information to predict any major event based on a hybrid further enchantment is required to explore some of the loopholes in the study as per Peter.
- 3. The Divine Matrix: Bridging Time, Space, Miracles & Belief. Author- Gregg Braden** ISBN10 1401905730, ISBN13 9781401905736. The Divine matrix is about the Divine network range in the unified global field that enables universal connectivity. Explains the roadmap of Spirituality from the fundamentals of Meta-Psychics, Bio-electric and bio-magnetic field of human beings.
- 4. Large effects of brief meditation intervention on EEG spectra in meditation novices by Rd.Joe Dispenza's (2017) novices P. Stapleton a, Dr. Joe Dispenzab, S. McGill c, D. Sabot a, M. Peach d, D. Raynor.** IBRO Reports 9(2020)290-301. The study investigated the impact of 223 meditators brain scan with EEG to predict the higher level of consciousness can be predicted to spontaneous healing in ailing people. Mental stress is a global health epidemic being linked to more than 23 million worldwide deaths each year. Majority of diseases are psychosomatic. Negative thoughts cause illness and positive state of being has a potential to heal the body. The participants would achieve altered states of consciousness to release a biochemistry to combat stress and create an inner environment needed for healing.

Findings suggest that brief guided meditation intervention may offer positive and immediate health benefits to help combat stress.

5. **Book name -The Hidden Message in Water. Author- Dr. Emoto Masaru, Year-2004. July 22, 1943. ISBN10 1416522190, ISBN13 9781416522195.** As a scientist Dr. Masaru proved that that human consciousness could affect the molecular structure of water. His research is widely accepted based on the concrete evidences that he showed to the scientific community. His book was a New York Times Best Seller. His research hypotheses was that water could react to positive thoughts and words and that polluted water could be cleaned through Prayer and positive visualization. Dr. Masaru started a peace His work demonstrated that water is shaped by environment, thoughts and emotions. Dr. Masaru Emo to put Water as a Living Consciousness on the map for the scientific world. He showed us how water is energy capable of more than we ever imagined. The power human thoughts sound and intentions must strengthen and disempowered is one of the greatest discoveries of our time.
6. **You Can Heal Your Life. Author- Louise Hay, ISBN Number 978-81-905655-8-5 (46th reprint 2019).** She was a writer and a founder of Hay House Publications. She was diagnosed with the terminal cancer and healed herself completely out of cancer and lived for 90 years and died in her sleep as she desired. She wrote the famous New York Times best seller book over 50 million copies sold. The book contains the name of the diseases & psychosomatic reasons for the diseases and affirmation that can be used for self-healing. She wanted to die in her sleep and manifested the same in 2017 died in her sleep peacefully.
7. **ENERGY FIELDS ELECTROPHOTONIC ANALYSIS IN HUMANS AND NATURE, Dr. KonstantiKorotkov. ISBN-13:978-1499216264ISBN-10: 1499216264.** Dr. Korotkov is a scientist and has invented a camera that can scan the human energy filed. What we always known as a part of an ancient Indian spiritual tradition about human aura. Human energy field can be captured in the camera from 6-8 meters however its not limited to this range. Science has only reached to capture that range. However, Dogs can smell human from 100s miles away. Hence there are possibilities of science to understand more on human energy field as individuals.
8. **HeartMath Solution for Better Sleep- Nov 2017, Author- Deborah Rozman PhD.& Rollin Mac Craty. ISBN-10 : 1945949562, ISBN-13 : 978-1945949562.** The book is based on the science established by a research institute Heart Math Science. She has over 40 years of experience as a business executive, serial entrepreneur, psychologist, author, and educator. This talks about the science of breathing to bring brain and heart coherence. There are easy workouts for the brain via Wave and Inner Balance. As one practice on the go, or at your computer, we can increase our heart-brain synchronization and your ability to take charge of your mental and emotional reactions and stress. Mental clarity and intuition, communications, relationships and quality of life all improve.
9. **Research article – Bio energetic Analysis- Love as Regulator of the Life Force. Author- Pye Bowden DOI: 10.30820.0743-4804-2020-30-85-2020 published in Psychosozial-verlag** the author proposes a role for love in the regulation of the body. The author spoke about the Heart, Resonance and Coherence & the impact of Love in creating this synthesis.
10. **Biology of Belief: Unleashing the Power of Consciousness, Matter and Miracles.13 Oct 2015 by Dr. Bruce Lipton. ISBN-10: 1781805474. ISBN-13 : 978-1781805473.** (A stem cell scientist) who was teaching in American University was curious to know the DNA blueprints and stem cells & he ended up giving new dimension on the old scientific theory of

gene being the authority of human destiny and he proved that genes can be changed with the environment and this new science is called Epigenetics.

11. **What Doctors Don't Tell You: The Truth about the Dangers of Modern Medicine – 2005, Author-LynneMcTaggart ISBN10 0007176279, ISBN13 9780007176274.** An award-winning journalist took the British medical establishment by sharing drastic data of 1.17 million people being on the hospital bed because of medical treatment gone wrong. She is listed as one of the top 100 most spiritually influential people. She is instrumental in establishing the new Science of Spirituality. She has written 7 books **The Intention Experiment, The Field, The Bond, The Power of Eight.** She has spoken of the power of human intuition & the consciousness.
12. **What the Bleep Do We Know- Author- William Arntz, Betsy Chasse and Mark Vicent (2007) ISBN-10 : 0757305628 ISBN-13 : 978-0757305627.** There is a movie shot on this book. An international bestselling book Guides reader on a course from the scientific to the spiritual; from the universal to the truly personal. *It refers to the quantum physics and all possible* theoretical scientists leading the way. The understanding of the universe and spirituality from science point of view. The thoughts, reality, and the power of our exists. The power of consciousness and the thoughts is explained with scientific theories.
13. **Mystical Dimensions of Islam. Author Miss Annemarie Schimmel (2010) ISBN-10 : 0807899763 ISBN-13 : 978-0807899762.** Author was an influential German Orient list and scholar who wrote extensively on Islam and Sufism. Internationally renowned, she was a professor at Harvard University from 1967 to 1992.

STATEMENT OF THE PROBLEM

The problem is that a Meditation and mindfulness practice has been widely considered as a religious or spiritual practice since the time we know the human history. The challenge is to convince the society at large to accept Meditation as a technology for overall health, wellbeing & fulfilment based on the scientific methods and evidences.

OBJECTIVES

1. To understand the science behind Meditation and mindfulness practices.
2. To establish a missing link between spirituality and science by relating the customs with scientific researches.

HYPOTHESES: - Is there any scientific evidence to trust Meditation & Spiritual practices as a tool based on technology. There may not be any reasons behind the rituals and customs in spiritual practices.

Research Methodology: -Research Methodology used for this Research Paper is based on secondary data. The latest research publications & books written by Scientist, Neuroscientist and Medical professionals by published the best publishing houses in the world & sold references of the books listed as New York Best Time sellers.

Analysis:-The power of human Mind, Thoughts, Feelings and Emotions makes us the most powerful or the weakest person in experience. The quality of human thoughts drives the biochemistry over 2000 to 2600 types of chemical changes happens in human body if goes through any emotional shift. The quality of emotions creates vibrations that gets converted into bio-magnetic electric current & creates human energy-field. This energy field can be pictured by the help of Bio-GDV cameras. Composite energy levels of all human beings can affect the resonance levels in the environment. The only way to change the negative thoughts into positive

thoughts through positive self-dialogue called affirmations. An affirmation done with feelings, emotions & active visualisation is a form of prayer. The spiritual traditions say “ask your lord as if it’s already given” in Islam it’s called “ Taqwa” meaning conviction in Hindu tradition it’s called Shraddha (deep faith). The inner awareness is called consciousness. It means being aware about our own thoughts and when experience negative thoughts replace them with the positive thoughts. Meditation is the only self-help tool and a technology that can help to overcome from negative thoughts, beliefs, fears, phobias.

The universe is connected based on the holographic rules i.e. one is a part of whole. Global Unified field network can be hacked by mindfulness practices Telepathy is real and developing psychic abilities is a matter of practice. The neurons that fires together, wire together. Neuroplasticity and placebo healings are real based on the laboratory experiments done by Dr. Joe Dispenza and Bruce Lipton & Heart Math Science Institute. Attention with intentions on positive thoughts, feelings, and emotions with clear positive visualization can enable anything that we wish for in our lives and hence we are the creators of our destiny. As mentioned in Vedic literature “Aham Brahmasmi” it simply means that “ I am the creator” how? By simply creating the thoughts, placing complete attention and taking actions in that direction we can get what we wish to achieve and hence we are the creators of our own destiny. Scientist has explained in detail what happens in the Unified global field when thoughts are created in the mind and manifested in reality. Sufis, mystics, gurus, and saints knew this knowledge and hence used to perform magical or mystical tricks and now science has explained how by raising our energy levels we can become supernatural beings.

Conclusion: -

- Human thoughts are responsible for changing the human biochemistry. Prolonged stress can cause sickness & diseases. Hence ancient Indian proverb seems to be true “Chinta Chita Samaan” (Worrying equals to death). This is Nocebo as mentioned by Dr Bruce Lipton in his research as a Stem Cell Scientist that if we believe that no treatment can be of help. People can actually die with Nocebo effect.
- Human heart in coherence with the brain can create healing bio-chemistry by placing intentions on positive thoughts and feelings such as appreciation, gratitude, care and compassion can heal disease (Placebo is been a very well known factor in self-healing).
- “Vasudeva Kutumbhakum” Science has now proved that as a human race we are all one family because few people if can pray together with the same feelings and emotions in different parts of the world can change the energy and resonance levels in the environment to help curve down the crime rate and increase peace.
- The concept of Prayers with feelings can place human bodies in a state of homothecies therefore the concept of 5 times prayers in Islam makes it scientific because as per Heart Math Science research, bodies release longevity enzymes after meditating for 3 minutes and the bio-chemistry releases happy hormones that stays for 6 hours in the body. and hence cause sickness or healing. Placebo impact and Nocebo.
- Biochemistry can be changed on purpose to activate DMT for experiencing universal connectedness, love, peace, harmony and healing. Dr. Joe Dispenza in his laboratories have helped people to regain their eye sights, hearing and cancer healing.
- Mediation is one technology that machines cannot perform and hence human being can only thrive and compete with the AI(Artificial Intelligence) and Smart intelligence with the divine intuitive powers by placing attention on the personal fulfilment and healing.

- There is a technology now available to train the brain to attune higher states of consciousness through neuro-bio feedback. Meditation training can be done via EEG brain wave scans through electrodes in a simple user-friendly Meditation Head bands such as Muse2, available on international shopping platforms such as amazon. The brain wave bio marker help to attain highest levels of calmness for providing a state of being where the body can heal & integrate with the highest potentials to rejuvenate physical, emotional, spiritual & holistic abundance.
- **Smart- Meditation with smart-watches** and smart applications are designed to assist in practicing mindfulness skills for better emotional wellbeing which is a prerequisite for a healthy lifestyle. This was one of the reasons of established prayers in all the religions and wisdom-based traditions. Ancients knew this science that was forgotten and now with scientist community curiosity in the domain is bringing it back with the help of advanced technology.

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ICT Application in Academic Libraries

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Abstract: In this paper author described application of ICT tools and techniques in academic libraries in present scenario. Paper explained the starting of ICT application in libraries and its history among world academic libraries. Further discusses the included technologies under the umbrella of ICT in libraries environment like computer technology, communication technology, optical technology, multimedia technology etc. Major library components covered under ICT application umbrella has been identified and explained clearly followed by functions affected by the use of ICT and its impact on library. Due to wider application of ICT in libraries, library professionals' role has been changed and this has been discussed elaborately with the conclusion.

Keywords:-ICT, ICT Application, Library Automation, ICT Impact on Libraries

1. Introduction:-The use of computers has been steadily increasing in science and technology since the 2nd World War. Most of the advanced countries of the world have made much advance in this respect but India has just made a start. However, their application is increasing day by day in science, technology, industry and business. Libraries are also no exception to them. As the library authorities and librarians are becoming aware of their potential uses, these are being put to more use. It is hoped that by their use, libraries would increase in the years to come in India, thought not at a rapid speed, especially because of our socio-economic conditions and the prohibitive of their installation and maintenance.

2. Information and Communication Technology for Libraries:-In the past, volume of information was not as large it is today, and the libraries were in the position to organize the information materials through manual operation. But since the 2nd World War, there has been a tremendous output of information, which has been usually referred to as information explosion. The materials of information in both print and non-print media continue to be produced and used in greater and greater quantities. As Xerox Corporation put it in one of their promotional brochures in 1984, "Recorded knowledge has doubled during the last twelve years. It will double again during the next ten." This vast amount of information has to be processed, stored and retrieved whenever required. Library and information professionals are increasingly being compelled to take the help of semiautomatic and automatic machines for information handling. The revolutionary developments in information technology have two impacts. Firstly, as more and more information is readily available in machine-readable form, there has been a fundamental shift in the concerns of the information profession from "more information" to "accurate, up-to-date and timely information." Secondly, as computers are used increasingly for provision of information, librarians and other information professionals must familiarize themselves with the latest technological development in this field.

3. History of ICT Applications in Libraries:-From last ten decades ICT is very developing in all over the world. Here are the progresses of ICT in all over the world in every decades. In 1930s, Herman Hollerith of the US Census Bureau invented Punch Card technology with the help of Dr. Jolul Show Billings.

In 1936, Ralph Parker installed Hollerith Punch Card system at the University of Texas for circulation control of the library and in the mid of 1940s the system was also experimented in the serial record control.

In 1950, the Library of Congress introduced a book catalogue using Punch Cards.

In 1960s, the first library automation was developed in U.S.

In the 1970s, integrated chips and storages devices were also developed and RLIN and WLN was started the online library networks.

In 1980s, the use of computers in libraries increased greatly. Many library automation packages came into the market and in the late 1980s; CD-ROMs that contained databases, information and software were also introduced.

In 1990s, the development of computer networking was started. The overwhelming explosion of technology with the latest one penetrate the library automation system till date that started using high technology services and security system in the library to facilitate information protection, sources and services.

4. ICT Application in Libraries:-Information Technology means a variety of technological applications in the process of communication of information. The term “information technology” has been used as collective term for the whole spectrum of technologies providing the ways and means as to acquire, store, transmit, retrieve and process information. According to the Webster’s New Encyclopedia, information technology is the collective term for the various technologies involved in the processing and transmission of information. Thus information technology includes computer technology, communication technology, multimedia technology, optical technology, networking and barcode technology, etc.

a) Computer:- Computer can store every variety of information recorded by people, recall it whenever need arises and can calculate millions of times faster than the human brain. Thus, computer can do precisely all those jobs in the library for which we use many devices with a set detailed instructions.

b) Communication:- It is used in communicating the information from generator to the user of the information. Some communication tools like telephone, fax, television, e-mail, and Internet are very much popular for communicating with the person.

c) Multimedia:- Multimedia is most commonly applied to the simultaneous use of sound, text, image and video in preparing presentations and used in bigger libraries where the special kinds of students have to access and used for it.

d) Optical:- Compact discs are one of the most important and useful electronic media of storing the information. A CD-ROM can store a huge amount of records of library like Ramayana and Mahabharata.

e) **Networking:** - Merging of computer and communication technologies has emerged as a networking. In India INDONET, CALIBNET, DELNET, INFLIBNET are some of the important networks.

f) **Barcode:**- Barcode can be defined as a self contained message with information encoded in a series of black bars of varying breadths and white spaces between every two of them. These are helpful in terms of circulation work and stack verification work of library documents.

5. Major Library Components covered under ICT Application

a) **Library Automation:**-Library automation is the application of machines to carry out the library operation or activity. Library automation is important to provide more and very high speed information accession, to minimize staff requirements, it facilitates handling of huge data or information and it increases library use. The basic requirements for automating library are the selection of computers with right hardware and software, computer skilled professional, conversion and standardization of data, resources and services. In the fully automated library, there are two types of operation works: library house-keeping operations, and library information handling operations which are performed with the help of computers. Library automation encompasses the house keeping operations which are performed by computers. The house-keeping operation brings acquisition, cataloguing, circulation and serial control.

b) **Digital Library:**-The first use of the term digital library, in print, may have been in a 1988 report to the Corporation for National Research Initiatives. The term “virtual library” was initially used inter-changeably with digital library. The term “digital library” was first popularized by the National Science Foundation’s Digital Libraries Initiative in 1994 with the funds of \$24.4 million from the US federal. This funding came through a joint initiative of the National Science Foundation, the Department of Defense Advanced Research Projects Agency, and the National Aeronautics and Space Administration. That US federal funds would be distributed for “digital library” research among six universities which were Carnegie Mellon University, the University of California at Berkeley, the University of Michigan, the University of Illinois, the University of California at Santa Barbara, and Stanford University. A digital library is a type of information retrieval system. It is a combined use of digital computing, storage, and communications machinery together with the contents like multimedia database, information mining, information warehouse, information retrieval, on-line information repositories, electronic library, imaging database, World Wide Web, and Wide Area Information Services.

c) **Internet & Library Services:**-Creating a library web site opens up endless possibilities for providing resource based and interactive services such as **local information, what’s on, book reviews, online magazines, quizzes, online surveys, local history materials, booklists, discographies**, and so on. Twenty-four hour access to a virtual library can be made possible. Internet has become an important tool to transfer information and offers a variety of services to create, browse, access, search, communicate and views information. Internet also plays an important role to enhance library services in providing better information service. The information services based on Internet are: e-journal, e-book, library catalogue, technical reports,

online databases, Web OPAC, e-mail based information services, online reference services, content page of journal, online bibliographic databases, etc. All these services provide useful information that can be accessed through online tools available over Internet.

d) Resource Sharing:-Areas of Resource Sharing: The network should be able to access some areas over the Internet like online catalogue, indexes, cooperative procurement, co-operative technical operation, preparation of union catalogue, co-operative storage, browsing privilege of cooperative members, co-operative in documentation, exchange of experts, co-operative interlibrary loans, document delivery services, consortia purchasing, and collection development etc.

Objectives of Resource Sharing & Networking: The main objectives of library resource sharing and networking are:

- By exchanging library resources and information for the user that will help the user to access the resources which are not available in their own library.
- To facilitates the maximum utilization of resources.
- To avoids duplication in resources.
- To make overall improvements of library services.
- To provide better library services with less budget and safe the times of user.
- To develop sharing policies for inter library loan and reciprocal agreements for special collections.

Nowadays the cost of reading materials is increasing day by day, so that libraries are facing difficulties to acquire collections. The publication duration of print materials take a long time so that print materials may not relevant enough in compare with soft copy which is available on the Web. The soft copy can be accessed rapidly on the Web at anywhere and then the emphasis is now shifting hard copy to soft copy to provide immediate information service. Therefore, library resource sharing and networking is very important in present ICT era.

6. Functions of Library affected by ICT Application:-The following operations of the library functions can be speedily processed by the computer. These are outlined briefly as:

Acquisition: Duplicate checking, Preparation of order lists, Sending orders to book supplier, Monitoring orders and follows up action, Verification with order file and invoices, Maintaining state of funds, budget control etc.

Cataloguing: Duplicating cataloguing cards, Preparation of authority file/subject headings list, Sorting, checking, and filing of catalogue cards, Automatic generation of added entries, Generating the monthly accession lists, Developing centralized and cooperative cataloguing system.

Circulation Control: Registration of members, Charging and discharging of documents, Updating the records file, Preparation of reminders, Maintaining statistics, Information retrieval etc.

Serial Control: Ordering of serials, Receipt and updating the record file, Receipt to vendors/publishers, List of holdings, Maintaining statistics, Information retrieval etc.

Documentation and Information Retrieval: Indexing of micro and macro documents, Thesaurus construction, Abstracting work, Compilation of union catalogue/lists, Bibliographic work, Searching and print-outs of queries of users. In addition to what has been outlined above, more library operations can be manipulated with the computer system to achieve efficiency, effectiveness, and to reduce per unit costs etc. ICT provides easy access to information resource and the facilities of technologies have been the driver of knowledge society.

7. Impact of ICT on Libraries:-ICT has wider connotations for librarians that include in addition technologies like repro micrographic technology, technical communication technologies and database creation and use. Information and communication technology has affected operations of various areas in the library sections which are given below:

a) Library Management:

b) Library Automation:

c) Library Networking:

d) Technical Communication:

8. Changing Role of LIS Professionals in ICT Environment:-As shown by S R Ranganathan, chairmen need to push the right information and make it open to the ideal individual at the ideal time, which is the adage of present day library. For the emerged of ICT libraries work has improve and Library specialists has used various systems to get to and offer information for customer's potential benefits. With the help of ICT data move has possible in electronic plan. In short my city has totally changed the strategy for information storing, the technique for course, the technique for library organization; Web OPAC is online stage, where we can glance through information from wherever. In library OPAC saves a huge load of period of customers and Library staff besides. The way which ICT has changed the libraries stage at the same way ICT change the work of guardians. It muchly influences overseers. Makes unique and different norms for them to work on themselves and overhaul the point of view on libraries. By and by a day's one of the huge standards of clerk, caretaker should have MLISc degree with IT data. Since it will helps e-library improvement, library coordinating data base new development and support, etc ICT increase the use of electronic organizations in libraries. Keepers should manage the ICT environment suitably, so they ought to have ICT capacity and planning to improve and use present day procedures in their libraries. At whatever point they have done it then it will help with having the chance to, give, and give information on electronically. ICT can offer authentic opportunities to deal with the idea of library organization and it has done by head. The ICT has reduced the opening between library organizations and the understudies or its customers. In this inventive environment library specialists expect a huge part to satisfy the customers. They should think about new manifestations in ICT and make themselves more material in new ICT environment. The development of ICT and their application in library and information centers has changed the nature of collections; the needs of users; the library environment and the roles of LIS professionals. The old concept of book centered librarianship has changed to the user centered librarianship. ICTs have paved path to new roles for LIS professionals. The LIS professionals as creators, communicators, leaders, mentors, and lifelong learners are monitoring

the trends in technology continuously to provide global information instantaneously to end-users through ICTs. In the Web environment, options of sources and format of information and flow of information have great impact on the role of libraries and library professionals. In development of collection tools, techniques and approaches has increasingly entered in the field of library services globally. It forces to change the way they are functioning in providing the information needs of their users. These new roles require different personalities for librarians as well as different skills and knowledge. The focus is on power to draw together different forms of communication, smoothly integrating them within a digital environment and providing access to the stored information using computer systems via telecommunications which are fast, friendly and interactive. The globalization of ICTs has posed various challenges before the LIS professionals in the nature of collections, the information environment and the radical change in the expectations and needs of the users. In digital environment, LIS professional's competence lies in: speeding up access to information, speeding up spread of information, filtering material chosen by users, organizing user information sources in standardized keyword and classification schemes, and developing expert vocabulary.

Major Challenges Of 21St Century Librarian

Information explosion.

Information and Communication Technology (ICT)

Growth and usage of web resources.

Use of digital resources.

User's expectations.

Virtual learning environment.

Virtual educational institutions.

Development of digital, virtual, and hybrid libraries.

Online bookshops and information services.

These challenges have called for orientation, reengineering, transformation, and great changes in the information environment, library functions, and the roles of library and information service professionals.

ICT skills include

- * Provide office applications
- * Provide and regulating library robotization systems
- * Conserve data bases in the libraries
- * Design library site pages
- * Online hoping to recuperate information

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A STUDY OF WASTE IN SOFTWARE DEVELOPMENT

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Abstract:-Lean thinking and agile methods are the two governing principles of the software industry today. While agile methods focus on quick delivery of the product, lean principles focuses on removal of non-value added activities, popularly known as waste (muda) in the lean world. A small introspection of both the approaches clearly points that both are striving to achieve optimization with maximum valuable output. This makes it essential for anyone working in the industry to be well versed with the concept of waste and how it affects the other activities of the project. Through this paper, an attempt has been made to perform a systematic review of how waste is perceived and understood in the present industry environment and how it is dealt with through study and analysis of 20 primary study papers.

INTRODUCTION:-Agile software development has been the buzzword of the software industry for more than a decade. A lot of practitioners have applied multiple approaches to inculcate its benefits into their existing frameworks.

Off late, lean software development has also drawn attention in the software industry. In fact, the current trend is to apply lean principles in an agile environment. While agile focuses on quality output delivered quickly; lean approach tries to minimize waste and work in progress activities. The applicability of lean in an agile or traditional environment is an area which is still widely addressed by the researchers. A close introspection of the software industry often reveals that most of the organizations work in a hybrid approach, wherein a section of projects and people still favours traditional approach where everything is planned before execution, while the other half believes in not planning too much in advance. There has been a number of principles, approaches and frameworks suggested in literature. Every approach finally works towards optimization and one fundamental aspect of optimization is the removal of waste. This paper enlists the information about waste, gathered from careful study and analysis of the software waste in the literature. The remaining sections of the paper are organized as follows. The next section gives an overview of agile methodology and LSD and the concept of waste in lean. The subsequent two sections express the work carried out in the past with respect to identification and classification of waste. The final section discusses the gaps in waste management and the open areas for research in this sub-field.

AGILE AND LPD:-Agile methodology is the brainchild of a group of developers who got together [21] in search of a lightweight development methodology. The basic ideology for agility is every iteration should learn something from its predecessor and must provide a value addition to the output of the previous iteration. The primary focus of agile approach puts interactions over processes; working software over documentation; customer involvement over contract and open and receptive attitude to change. Lean software development further extends the foundation of

agile software development by empowering the team, deciding as late [22] as possible but making sure that the delivery is as fast as possible. One the fundamental principle of lean is eliminate waste. Waste has been defined in the literature as any non-value added activity. The seven original wastes identified for LSD were [6] task switching, defects, waiting, motion, extra processes, partially done works and extra features. Since these activities does not add any value but consumes resources, it is important for any organization to identify such activities and eliminate them from the process as fast as possible.

UNDERSTANDING SOFTWARE WASTES : A PEEK INTO THE LITERATURE:-

Although, the literature is flooded with papers on software quality enhancement approach, only few of them have reported empirical evidences supporting the same. Also, there still exists a need for further exploration of the concept of waste, its meaning, classification, measurement and removal. In this section, an attempt has been made to highlight the significant contributions made in the literature towards understanding waste

Pilar Rodriguez et. al. [1] through their study reveal that any organization planning to combine lean and agile approach must add some elements to their existing framework like WIP, Kanban etc. , with waste removal among one of essentials among them.

Alexander Poth et al. [2] gives an overview of the different software process improvement approaches used in various agile and lean environment and states that “seeing waste” and “value stream mapping” are the most effective support tools for eliminating wastes.

J. Pernstal et al. [3] states that in order to stifle waste occurrence, it is very essential for an organization to establish customer defined values so that the remaining activities can be planned out based on this understanding and keeping what creates value to the customer in mind.

Ward [17] draws the attention to lean software development and how wasteful activities if identified and removed from the process can increase the project success rate.

[4] have also argued that for continuous software process improvement, value and waste are the most important lean elements and these complement and fit well within an agile context.

Kupiainen et al. [5] enlisted the metrics used by various earlier works to identify the non-value added activities.

Mujtaba et al. [20] used lead time, processing time and queue time as metrics to build value stream maps in order to reduce the waste and lead time in a software product customization process

Peterson [19] have tried to identify lean indicators to detect wasteful activities in software maintenance. Some of the indicators pointed out include unbalanced workload of developers, number of maintenance requests for built-in quality indicator and the like.

Poppendick et. al [7] identifies relearning as one of wasteful activity as the team has to superimpose ideas on their existing knowledge base and has several psychological barriers to pass through.

Anderson et al [8] states wishful thinking and correcting as waste activities leading to longer lead times

Mandic et al [9] enlists uncertainty, limited information access, space and time distortion, procrastination as primary wasteful activities in their study.

Braglia et. al [11] gave a different perspective to waste identification by qualifying “failure demand” as an activity which leads to longer maintenance time

Ikonen et. al [10] enunciates a list of wasteful activity which are strictly domain dependent namely developing unnecessary complex solutions, ineffective communication, mismanaging backlog and knowledge loss.

Alahyari et al [6] performed a study of [7],[8],[9], [10],[11] and several others and re-identified several wastes and have tried to map them to the ones found in literature and other studies. They identified a set of wasteful activities in different domains namely processes, requirements and design, management and organizational aspects, pre-studies, third party dependence and the like.

Rossi et al [13] contributed with a novel method capable of identifying wastes in an enterprised setup.

Womack [14] was one among the earliest to point out the concept of wastes and how the elimination of it may fine tune the development process and hence be profitable for an organization.

Belvedere et al. [12] classified various wasteful activities into seven waste macro-classes. The entire analysis was conducted for complex projects. [15][16] and [18] addresses the issue of project complexity and also highlights that the waste identified are domain specific and hence generalizations of the same are a tough task.

The macro-classes identified in [12] were over-engineering, project vision waste, inventory, waiting, unused employee creativity, hardware over-processing and correction.

DISCUSSION:-A study of the literature clearly reveals that the concept of waste lacks a unified definition. The minimization of waste is an important ideology of lean and agile software development. But it is quite evident that, this not possible unless there is convergence in the way an organization sees, understands and works towards the elimination of waste.

Also, there is no general agreement towards the types of wastes. Several of the works have classified wastes into different macro classes, which are strictly application dependent. And, it also involves active involvement from all the stakeholders, since people are most essential components of software development. An activity which is classified as waste by one team might be a value added activity for the other. Also there exists a very thin line of difference between wastes and overheads. For an organization, to effectively eliminate waste, a common understanding among its members is crucial, coupled with the knowledge of the type of environment in which the current setup exists. By environment, the emphasis here is whether it is a pure-agile, working-towards-agile, or a traditional setup. There are a lot of research gaps existing in this area, requiring further probing into software wastes. A need to identify waste, classify waste, measure waste, and decide whether to discard the wasteful activity or to sustain the redundancy could be considered as an area requiring immediate attention as pointed out by many in the literature. The ultimate goal of this is optimization, but care has to be administered

that excessive optimization should not lead to loss of efficiency of the software development process.

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Ethical Issues in Forensic Psychiatry

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ABSTRACT:-Forensic psychiatry is branch of clinical psychiatry that works at intersection of law & medicine. It is concerned with patients who have mental illness in addition to having committed significant crime. Forensic psychiatric facilities are low-volume, high-cost services that place considerable limitations on their inmates. Patients may be held in those facilities against their will for long periods of time, possibly for rest of their lives. Objective of this custody is twofold: to care for & treat sick, as well as to safeguard public from harm caused by the criminally ill. Discovery that some psychologists were complicit in torture of captives at Guantanamo has brought ethical difficulties in forensic practise into sharp light in last year. There was certainly lot of worry about convicts being tortured through psychological testing & therapies. For example, psychologists foolishly introduced tactics that had never been utilised in interrogation to coercive interrogations, despite lack of empirical proof that these tactics were effective in this situation. Furthermore, psychological testing was utilised to identify who needed "enhanced interrogation," another area where there was no study. Additionally, there is well-established ethical principle of doing no damage. As result, it was unethical on multiple levels. In their ethical codes or speciality standards, all mental health professions contain comments about taking reasonable precautions to prevent injuring not just patients but also others with whom they may deal. While involvement in torture is most obvious example, we will also discuss less dramatic examples, such as when mental health professionals conduct examinations & therapies without fully considering implications of their actions. Another issue that has arisen as result of these concerns is non-participation of examinees in evaluations. There are several significant distinctions, & whether or not practitioner can provide any type of judgement on someone who refuses to be evaluated is discussed in length. Differences in how confidentiality & privilege are managed, as well as difficulties with methodology, advertising, & use of evaluation methodologies, will be discussed. Finally, in closing part, we will assess strengths & limitations of each of codes & guidelines, as well as make recommendations for improvement, in order to finally arrive at uniform set of standards.

KEY WORDS- Ethics, Forensic psychiatry, mentally disordered, Long Stay, Mental Health.

INTRODUCTION:-For variety of reasons, forensic psychiatry's ethical difficulties are more complicated than those in normal psychiatry. Although forensic psychiatrists perform usual therapeutic tasks in correctional institutions & forensic psychiatric institutions, many professional actions considered to be part of specialization are specific to that field. Term "forensic psychiatry" is frequently misunderstood. Informed consent to treatment, right to consent or refuse treatment, confidentiality, & civil commitment are all problems covered by broad definitions. Narrow definitions confine phrase to legal or administrative psychiatric examinations (rather than therapy). The following definition of forensic psychiatry has been adopted by American Academy of Psychiatry & Law (AAPL):[1] Forensic psychiatry is subspecialty of psychiatry in which scientific & clinical expertise is applied to legal issues in legal contexts encompassing civil, criminal, correctional, or legislative matters: forensic psychiatry should be practised in accordance with profession of psychiatry's guidelines & ethical principles. Many ethical difficulties arise in practise of forensic psychology & psychiatry. This article will look at these challenges through lens of numerous current codes of ethics & guidelines. American Psychological Association, Canadian Psychological Association, European

Federation of Psychologists, as well as Specialty Guidelines for Forensic Psychology & Guidelines of American Academy of Psychiatry & Law, should all be taken into account. Forensic psychiatrist or psychologist works in legal system, which is not same as therapeutic system. [2] Rather, judicial system pursues truth & justice for all parties involved, regardless of harm that may be caused to defendant in criminal case, plaintiff in civil case, or person in administrative legal issue. Goal of criminal justice system is to punish people who have committed crimes. Court seeks justice in civil cases by awarding damages to persons who have been wronged by others. Court also tries to figure out who hasn't been injured but claims to have been. Judicial system employs forensic mental health professionals to assist in discovery & adjudication processes. Forensic psychiatrist may find himself or herself working in system that is not therapeutic & can injure variety of people. This understanding of how Standards are derived from Principles & how they must be represented in ethical decision-making processes is significantly clearer than that contained in either A.P.A. Code or Specialty Guidelines for Forensic Psychology. Similarly, American Academy of Psychiatry & Law Guidelines do not appear to distinguish between inspirational concepts & enforceable Codes, but rather address them in unified way. This article will focus on assessment (rather than treatment) obligations in forensic psychiatry, & will examine some of numerous contemporary ethics difficulties in adult forensic psychiatry.

Staying in forensic psychiatric treatment for long time:- Clinical experience & studies reveal that secure forensic services are not always used efficiently, with patients remaining in overly restrictive settings for far too long, no longer needing or benefiting from interventions provided. In 1990s & early 2000s, series of studies in England found that between one-third & two-thirds of patients in high-security institutions did not require that degree of protection. Inadequate provision of medium secure beds was deemed to be major cause in delayed transfer of patients to more suitable levels of security; as result of these results, "accelerated discharge programme" was established. Medium security estate's capacity has increased, but high security estate's bed numbers have decreased. Nonetheless, there are recurring worries about amount of time patients are kept in secure environments. Although some valuable insights have been gained, research identifying LoS in forensic settings, variables associated with long-stay, & characteristics & needs of persons who stay in secure care for lengthy periods of time is limited. To begin with, LoS in forensic psychiatric settings substantially exceeds that in normal psychiatric care, despite fact that only little research has directly compared these two settings. According to recent research based on one-night census of 1.2 million population catchment area in North London in 1999, non-forensic beds had median length of stay of 79 days, whereas forensic settings had median length of stay of 1367 days. [4] In all, 23.4 percent of general psychiatric patients stayed for more than one year, & 17.9 percent stayed for more than five years, compared to 81.2 & 39.1 percent for forensic patients, respectively. According to studies conducted in England, high security care has average LoS of around 8 years, with approximately 15% staying for 10 years or more; similarly, medium secure care has average LoS of approximately 5 years, with comparable percentage staying for 5 years or longer. International studies have found figures that appear to be comparable in magnitude, with average LoS at discharge of around 10 years; however, these figures are based on endpoint of discharge into community, whereas in England, LoS in settings of varying levels of security must be added up to calculate overall LoS in secure care. Despite difficulty in comparing statistics & lack of agreement on how long is "(too) long," it may be determined that offender patients spend considerable portion of their lives in secure care with little influence over their lives. Patients with severe psychopathology, non-engagement &

dependency needs, long psychiatric histories, more serious offending, & those subject to "restriction orders," i.e., Ministry of Justice's mandatory involvement in care decisions, are disproportionately affected by long care episodes, & some may spend rest of their lives incarcerated. It's unclear what type of mental health, psychological, & service needs this long-stay group could have, or how to effectively provide them. [5]

Ethics concerns are resolved informally :- If psychologist becomes aware of what appears to be unethical behaviour on part of another psychologist, A.P.A. Code of Ethics states that if informal resolution appears appropriate & intervention does not violate any confidentiality rights that may be involved, psychologist should first attempt to resolve issue by bringing it to attention of that individual. In forensic setting, however, contacting someone who may be opposing expert witness is usually not smart idea, as psychologist might be accused of witness tampering. "When apparent or potential ethical violation has caused or is likely to cause substantial harm, forensic practitioners are encouraged to take action appropriate to situation & consider number of factors, including nature & immediacy of potential harm, applicable privacy, confidentiality. They explain procedures that must be taken to address alleged ethical conflict, which may include seeking expert advice, hiring attorney, or talking directly with client. Concept of informal resolution is also highlighted, as is reality that if informal settlement does not work out satisfactorily, then more steps may be necessary. In nutshell, this is significantly more extensive definition than basic Code of Ethics provides. [6]

Consent Based on Information:- The second ethical concern is permission, which entails informing value about what will be done with data gathered & what impact it will have on person being evaluated. In addition, I may be required to testify about what I learned during examination in hearing or in court. Examinee should be informed that such disclosure may be necessary, & that I would be unable to keep what he told me secret. He has to be educated about what will happen to his information so that he can consent to test properly. It's also critical that any information supplied to individual being investigated before he or she divulges any information includes potential ramifications for him or her in that specific circumstance. Supreme Court reversed guilty conviction in case of Barefoot v. Estelle in Texas because expert who provided information to defendant did not disclose that his evidence may result in defendant obtaining death penalty. [7] People have right to refuse to work with forensic psychiatrist, & many will for variety of reasons. Individuals have refused to consult with me because their counsel informed them that I was neurologist, not psychiatrist. "What does my attorney think of me? Am I insane?" they wondered. They refuse to comply until they have had opportunity to speak with their attorney & comprehend purpose of examination as well as my role. When I visit someone in prison, defendant may sometimes refuse to talk with me unless his counsel is present, which must be arranged at later time. I usually give defendant benefit of doubt & enable him to refuse to comply until his attorney is notified & they can come up with solution that is least destructive to him. [8]

Forensic Methodology:-Methodology in forensic science forensic practitioners do not falsify or withhold relevant evidence or views, do not misrepresent evidence, & do not seek to evade or refute contradictory evidence, according to Specialty Guidelines for Forensic Psychology. There should be open investigation that gathers facts from all sources & does not jump to conclusions. However, once opinion has been developed, psychologists might vigorously advocate for their viewpoints. It is legal need to reveal all sources of information used to generate opinion. Methodology in forensic science forensic practitioners do not falsify or withhold relevant evidence or views, do not misrepresent evidence, & do not seek to evade or refute contradictory

evidence, according to Specialty Guidelines for Forensic Psychology. There should be open investigation that gathers facts from all sources & does not jump to conclusions. However, once opinion has been developed, psychologists might vigorously advocate for their viewpoints. [9] It is legal need to reveal all sources of information used to generate opinion. Defendant's relatives documented fact that he had been acting strangely for several weeks, & he did speak about delusional thoughts regarding person he killed & region in where he discovered him during forensic assessment. During cross-examination, prosecutor presented expert witness with letter written by defendant to his girlfriend, in whom he stated that his lawyer was sending psychologist to meet him & that he would be "faking out" doctor. This letter had been hidden from expert witness by defense attorney, & jury was affected substantially by that evidence. Guidelines go on to suggest that non-referral-related content should be limited to bare minimum. When remarking on another practitioner's work, it's important to maintain professional & friendly demeanour. One is to refrain from making comments about matters in which one is involved outside of court, & to limit comments to material in public record. [10] As previously stated, opinions must be based on sufficient evidence, & if insufficient data is supplied, report must declare that results' validity & reliability are restricted, & that practitioner may not have direct knowledge of scenario. Information must be reported accurately, with alternate possibilities not being suppressed. This applies to financial ramifications as well, including avoidance of any contingency costs. American Academy of Psychiatry & Law's Guidelines essentially state same thing, talking about honesty & aiming for truth, & emphasising that retention by one side exposes practitioner to risk of inadvertent bias & distortion of ideas. Complaining witness did say, "He was talking out of his mind," but significance of this cannot be understood with clarity until complaining witness is interrogated.

In forensic psychiatry, there are several difficulties that need to be addressed :-The parameters of psychiatrist-patient connection are defined by boundaries in psychiatry. Such distinctions are as important in practise of forensic psychiatry as they are in clinical psychiatry. Although there is no typical doctor-patient relationship in forensic psychiatry (as there is in normal psychiatry), there are several boundary difficulties. Boundaries are frequently set in part by contract between forensic psychiatrist & relevant legislation or referral agency or attorney, but there are also crucial ethical boundaries. In order to maintain adequate boundaries while performing forensic psychiatric assessments, psychiatrist should preferably have no other personal or professional interaction with value in past, present, or future. Dual personal, sexual, or business ties with evaluatee, members of evaluatee's family, or attorney would be improper & would certainly result in skewed, non-objective appraisal. Comparable idea that treating psychiatrists should not undertake forensic examinations on their present patients is more complicated. Owing to psychiatrist's changing position, such evaluation is likely to interfere with or hinder patient's therapy due to multiple responsibilities & conflicting commitments. Furthermore, treating psychiatrist may lack necessary facts or skill to undertake impartial forensic review, putting patient's forensic interests at risk. Treating psychiatrists, on other hand, may present factual information or evidence regarding their patients, but not expert judgments on issues like damage causation. When faced with requirement for forensic examination, particularly one that involves litigation, treating psychiatrists are encouraged to send patient to another psychiatrist for impartial assessment. This is therapeutic kind of role splitting, as opposed to separation of psychotherapist & pharmacotherapist, which, though widespread in modern psychiatric treatment, has several drawbacks. Secrecy of forensic examination is critical to maintenance of forensic psychiatry's limits. As needed by law or

contract, third-party evaluations necessitate disclosure of otherwise secret material to plaintiffs, counsel, agency, & judge or jury. In reality, forensic psychiatrist must explain nature (i.e., non-treatment connection), goal, & non confidentiality of evaluation process to evaluatee at commencement of assessment for ethical & sometimes legal reasons. Psychiatrists are, however, mandated to maintain anonymity & privacy of evaluator, & are sometimes forced to sign written confidentiality agreements before participating in case. Improper practises include submitting expert report to media or participating in illegal press conferences following court testimony in high-profile case. Similarly, without approval of retaining attorney, psychiatrist should not have communication with any of opposing attorneys or experts in case. [11]

Evidence-Based Psychiatry:-In addition, rules state that forensic psychiatrists' work should be based on data that supports their conclusions. "They communicate honesty of their work, their efforts to achieve objectivity, & soundness of their clinical opinion, to extent possible, by distinguishing, to extent possible, between verified & unverified information, as well as between clinical 'facts,' 'inferences,' & 'impressions,'" according to guidelines. Several cases, notably Daubert & Kumho, have replaced Frye as standard for presenting testimony in court in several jurisdictions. In most circumstances, court must act as gatekeeper, limiting testimony to that which is based on scientific facts rather than "junk science." testimony must also be useful to fact-finder, whether it is judge or jury. [12]

In forensic psychiatry, ethical practise is enforced :-Concerns or formal complaints about psychiatrists' practise in forensic psychiatry do emerge from time to time, which is unsurprising. Psychiatrists hired by opposing parties in lawsuit have been known to accuse one another of unethical or poor practise. On rare occasions, losing litigant will file unethical practise complaint against opposing side's psychiatric expert. Such complaints should be addressed to American Psychological Association (APA) & its district offices, where they will be investigated & prosecuted if necessary. There is no system or system in place at AAPL to investigate or adjudicate such concerns. Despite fact that AAPL has official ethical rules for forensic psychiatric practise, APA has not accepted those or any specialty organisation rules as its own. As result, APA cannot utilise AAPL ethical rules as basis for adjudicating ethical complaint against APA member; but, state board of medicine might utilise AAPL ethical rules for prosecuting psychiatrist who has broken them when practising forensic psychiatry. Psychiatrists who conduct forensic psychiatry, whether as little or significant part of their practise, should be conversant with relevant sections of APA ethical code, AAPL ethical standards, & forensic psychologists' ethical standards. Furthermore, both APA & AAPL have issued ethical committee decisions that provide material pertinent to forensic practise. Several portions of American Psychological Association's (APA) ethical code are directly applicable to forensic practise. For example, psychiatrists who undertake forensic examinations but do not provide adequate service, work beyond their area of competence, breach confidentiality, abuse value, or cross borders. If they misrepresent their qualifications or testify dishonestly, they risk being sanctioned by American Psychological Association (APA). Psychiatrists are accountable for following professional ethics norms & may not claim that they follow their own subjective ethics norms, whatever they may be, in order to defend themselves against claims of unethical behaviour. There are few options for formal instruction in ethics of forensic psychiatric practise outside of formal fellowship training in forensic psychiatry. General psychiatrists should take advantage of possibilities provided at national & local conferences for customised self-study. [13]

Honesty & pursuit of objectivity:-The psychiatrist's general approach to case in first place is relevant boundary concern in forensic review. According to AAPL Ethics Guidelines for Practice

of Forensic Psychiatry, forensic psychiatrists must give consultation & expert evidence with honesty & neutrality. These criteria are similar to, but go beyond, legal need that witness swear or affirm to speak "truth" before giving deposition or giving court testimony. To be ethical, expert's consultation & work, which serves as foundation for eventual court or deposition evidence, must be as truthful & impartial as feasible. For professional forensic psychiatrist, there are several possible causes of prejudice & lack of objectivity. External elements such as subtle or overt pressures from retaining agency or attorney who is ethically bound to vigorously advocate for his or her client, as well as psychiatrist's own personal & political philosophy & emotional functioning, play role. In criminal case, prosecution-oriented psychiatrist may consider that it is her responsibility to defend society from dangerous offenders. Defense oriented psychiatrist, on other hand, may argue that it is his obligation to address societal injustice by reducing defendant's sentence. Psychiatrists are required to make every effort to minimise these concessions to impartiality, including refusing to recommend patients from beginning. In every forensic case, however, no psychiatrist is absolutely devoid of bias. In adversarial litigation, use of court-appointed experts has been recommended as preferred alternative to privately engaged experts. Because attorneys cannot "shop" for forensic views & experts, such specialists are regarded to be more impartial, impartial, & less politicised. Many courts have jurisdiction to appoint & reward such experts in civil & criminal cases, albeit such appointments are uncommon, unless they are in field of competency to stand trial. There is paradoxical risk that court-appointed experts may have too much power in eyes of jury, thus usurping judge's or jury's authority. [14] Honesty is commonly understood to indicate that psychiatrist subjectively feels facts, conclusions, & views in case & testimony are true. This subjective type of honesty & truth can be distinguished from objective or absolute truth of topic, which psychiatrist cannot perceive. Determining whether or not psychiatrist is being truthful or impartial in particular instance is difficult & often contentious. It may be necessary to gather detailed information that may only be gained through tapes or transcripts of forensic psychiatric interviews. It's also tough to keep eye on oneself for excess prejudice & lack of impartiality. Litigation can take long time, & psychiatrist, litigant or value, & retaining attorney or agency all have to work together. [15] Each encounter has potential to jeopardise psychiatrist's ethical responsibility to maintain neutrality. Bias or even full lack of objectivity, in psychiatrist might be evident from start of case or develop over time. When impartiality & independence from excessive prejudice cannot be maintained as work on case progresses, psychiatrist may be required to resign ethically from case. Psychiatrist must reject any pressure from retaining attorney or agency to offer forensic opinion, report, or testimony that supports their position. Attorneys will occasionally ask for draught version of expert report from psychiatrist, & then urge psychiatrist to remove facts or views that damage their side's legal position in case. Psychiatrists may behave or feel that providing opinion & testimony in support of retaining side is important for psychological reasons such as desire to please others, or for commercial considerations such as remuneration on present case or referral of future cases. In instance of forensic identification, when psychiatrist increasingly identifies or associates with retaining side, sometimes unknowingly, more subtle biasing impact arises. Following preparation of psychiatric expert report, attorneys in court will occasionally press psychiatrist to testify in way that bends expert's conclusions in attorney's favour. [16] Non - testifying consultant engaged by attorney or litigant differs from testifying expert who has personally examined litigant in broader forensic practise of testifying expert. nonwitness expert consultant does not interview litigant directly, but instead assists attorney or agency in pursuing party's legal agenda by reviewing professional literature, conducting mock

trials, assisting in jury selection, preparing witnesses for testimony by assisting them in improving their communication skills, & investigating qualifications of testifying experts in case. Non-testimony expert consultants may ethically "join team" of advocates for retaining party in case rather than attempting objectivity in their work; however, psychiatrists should not attempt to substantially serve both testimonial & non-testimony roles in same case, because underlying ethical responsibilities differ. [17]

CONCLUSION:-The purpose of this paper was to explain some of most serious ethical issues that forensic psychiatrists encounter. Much of forensic psychiatry is performed by general psychiatrists who lack specialized forensic training & must thus get acquainted with types of issues they would encounter. They should also be conversant with forensic psychology & forensic psychiatry organization's ethics regulations, which are revised on regular basis. When psychiatrists go beyond their scope of practise, their contracted responsibility, or circumstances of case, they frequently face ethical concerns. We argue that thorough rethinking of role of forensic psychiatry is required to meet these ethical issues. If goal is to care for & treat patients, as we believe, then limiting length of detention to that of non-disordered offenders for same offence & locating public safety within criminal justice system rather than healthcare system, as well as focusing more seriously on quality of life of those detained in health settings, would be helpful first steps. However, challenge of changing entrenched attitudes & practises to point that several stakeholders band together to maintain status quo may restrict extreme remedies. Forensic psychiatrists face complicated set of ethical norms & difficulties that tend to grow with time & with experience. In forensic practise, we cannot use same standards that we use in therapeutic psychiatry. We are not there to assist person; rather, we are there to evaluate honestly & objectively. If we desire, we may be therapeutic in our evaluations, assisting individual in navigating tough evaluation that is essential but does not have to be negative or detrimental.

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TRENDS IN FORENSIC PSYCHIATRY

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ABSTRACT:-Forensic psychiatry is discipline of psychiatry that deals with difficulties that arise at intersection of psychiatry & law, as well as transit of mentally ill criminals through social institutions. Four major developments have aided modern forensic psychiatry: better understanding & appreciation of relationship between mental illness & criminality; evolution of legal tests to define legal insanity; new methodologies for treating mental illnesses that provide alternatives to incarceration; & changes in public attitudes & perceptions of mental illness. This study examines present scope of forensic psychiatry as well as ethical challenges that discipline faces across world. While psychiatrists might occasionally assist judges in making better judgments', there is reason to doubt that much of today's psychiatric engagement in legal matters serves meaningful social purpose. Psychiatrists are now spending more time in court defending patients' treatments that have never been questioned previously. In light of present societal conditions, legitimacy of assaults on particular psychiatric procedures, as well as possible long-term implications on patient care, must be reconsidered. In some countries, child & adolescent forensic psychiatry is becoming recognised as mixed specialisation. In majority of nations studied, specialty training in psychiatry now includes some didactic & clinical forensic psychiatry. significant international developments in formation of speciality of forensic psychiatry are highlighted in this paper.

KEY WORDS- Forensic Psychiatry, Psychiatry Training, Trends, Mental Health Legislation.

INTRODUCTION:-There is connection between mental health & criminal justice systems in forensic psychiatry. Health practitioners working in this field must address requirements of people with mental illnesses in framework of law.[1] The Mental Health Act of 1983 specifies variety of measures relating to psychiatric treatment for mentally ill criminals in several parts. Prior to sentence, defendant may be sent to hospital for mental evaluation or treatment. Remanded inmates who require mental care may be sent to hospital. interim hospital order may be issued to offenders who have been convicted but not punished. court may issue hospital order at time of sentence. If mentally ill criminal is deemed to be high danger, order restricting offender's release may be added. Home Secretary can order defendants to be committed to mental institution if they are deemed unfit to plead or not guilty by reason of insanity. Depending on their requirements, mentally disturbed criminals may also be placed under guardianship or granted probation order with treatment requirement. Conflicts in society as whole produce dynamics that impact forensic psychiatry. To avoid anarchy, we live in highly complicated, overpopulated, technological civilization that relies on high degree of social control. activities of few hijackers, blackmailers, kidnappers, or saboteurs can nearly completely destroy large & highly connected networks. However, at same time as our society is in critical need of more effective social control, individual willingness to trust authority has eroded significantly. It is currently being settled by courts, which have final legal power. Our overburdened civil & criminal courts must operate in adversarial manner, exposing societal problems & court's activities to intense public scrutiny. nuances & repercussions of issue are available to public examination once it has been contested. However, court is public institution as well. judicial agency's prejudices, limited skills, & even blunders are not readily masked. Attorneys & judges, faced with additional obligations & demands, have sensibly sought for new sources of professional aid. evolution of medico-legal understanding & appreciation of relationship between

mental illness & criminality; evolution of legal tests to define legal insanity; new methodologies for treatment of mental conditions that provide alternatives to custodial care; & changes in public attitudes have all aided modern forensic psychiatry.[2] These four events are at heart of forensic psychiatry's recent extension from concerns solely linked to criminal prosecutions & treatment of mentally ill criminals to wide range of other sectors of law & mental health policy. American Board of Psychiatry & Neurology, constituent board of American Board of Medical Specialties, recognised forensic psychiatry as subspecialty in United States, reflecting growing recognition of importance of subspecialty training in forensic psychiatry, which has also been formally recognised by Role of Forensic Psychiatry Specialist Advisory Subcommittee of Role of Forensic Psychiatry. In addition, relevance of forensic psychiatry in training of professionals in general psychiatry & child & adolescent psychiatry has recently been highlighted. [3]

OBJECTIVES & CHALLENGES:-The discipline of psychiatry that deals with difficulties occurring at border between psychiatry & law is often classified as forensic psychiatry subspecialty. This description, however, is rather limiting, because significant component of forensic psychiatry's job involves assisting mentally ill people in legal difficulty to traverse three entirely opposing social systems: mental health, justice, & corrections. As result, term should be changed to "the field of psychiatry concerned with challenges emerging at intersection of psychiatry & law, as well as movement of mentally ill offenders along continuum of care system of social relations. Forensic psychiatry deals with issues that occur in civil law case evaluations & creation & application of mental health regulations, as well as those that emerge at junction of penal & criminal law. [4]

Forensic psychiatry is subspecialty of psychiatry:-The Accreditation Council for Graduate Medical Education in United States (ACGME) has announced new programme standards for forensic psychiatry residency education. ACGME defines forensic psychiatry as psychiatry subspecialty that focuses on interrelationships between psychiatry & law, emphasises importance of psychiatric evaluation of individuals involved in legal system, consultations on behalf of third parties (including insurance companies & employers), correctional psychiatry (including that for patients in prisons & patients in special forensic psychiatry units), & correctional psychiatry. ACGME mandates that trainees in US institutions complete full didactic & clinical curriculum, which includes fifth year of speciality training after completing four-year general psychiatry residency. comprehensive discussion of history & practise of forensic psychiatry, as well as fundamentals of law (including civil & criminal law) as it applies to forensic psychiatry, & conferences in forensic psychiatry, such as grand rounds & case conferences, are all part of didactic curriculum required in training programme in United States. Clinical experiences needed of trainees at approved US schools include evaluating criminal responsibility, competence to stand trial, sexual misbehaviour, & dangerousness, as well as mental regulation problems. study of clinical & legal documentation, production of written reports, & presentation of testimony are all part of forensic curriculum. [5]

Trends in field of forensic psychiatry:-The question of care & treatment of mentally disordered offenders was only raised as result of changes in general psychiatry, particularly open wards, improved treatment methods, closure of large psychiatric facilities, opening of smaller psychiatric units, & development of community services. With developments in general psychiatry, pattern emerged in which psychiatric facilities became increasingly hesitant to admit clients who were deemed difficult & hazardous. In addition, it became clear that number of persons with mental illnesses in jails was growing. In forensic psychiatry, substantial developments have occurred during previous two decades. Establishment of secure units was

proposed in both Glancy Reports. Since then, money has been allocated to create regional secure units in each of health areas. Regional health authorities, district health authorities, National Health Service workers, local communities, & planning inquiries have all contributed to development of these. size, architecture, & secure arrangements of regional secure units vary, as does mix of workforce & how personnel will create services. Mentally ill criminals should be cared for in their own communities if at all possible, by competent professionals who use individualised treatment strategy. Assessing needs of local populations, interagency cooperation, expanded range of services, & diverting people away from traditional locations & services were also highlighted in this research. These suggestions are critical for maintaining continuation of care for mentally ill criminals. [6]

Mental health legislation & systems:-The double revolving door phenomenon, in which mentally ill people move between mental institutions & prisons, has made forensic psychiatrists acutely aware of interactions in mental health system & interconnections between it, as well as legal & penal systems. Due to their involvement in legal matters, forensic psychiatrists have developed strong interest in drafting & implementation of mental health legislation, particularly on issues such as involuntary commitment, which in many countries is based on determination of dangerousness rather than simple need for treatment, management of mentally ill offenders, & legal protections for incompetent people. Because one of their main areas of competence is assessing violence & probability of future violent behaviour, forensic psychiatrists are frequently relied upon to perform risk assessments for violent civilly committed patients. [7]

Legislation, establishment of suitable mental health systems, & delivery of care, whether in institutions or in community, are all intertwined. Deinstitutionalization as result of closure of old mental hospitals, changes in health care delivery systems toward short admissions to general psychiatric units & subsequent treatment in community, & mental health legislation with overly restrictive commitment clauses, even for short-term commitment. expansion of forensic psychiatry may be attributed to changes in legislation & more liberal acceptance of psychiatric reasons for behaviour, but enormous number of mentally ill people in forensic institutions, jails, prisons, & penitentiaries is more urgent factor. As result, failures in broader mental health system might be at foundation of forensic psychiatry's expanding prominence. programme of deinstitutionalization that governments have adopted over last fifty years is one of most widely presented explanations for enormous number of mentally ill people emerging in justice/correctional system. Deinstitutionalization, in general, refers to legislative decisions to close large mental hospitals & re-integrate patients into community, with short stays in general hospital psychiatric units, outpatient treatment options, psychosocial rehabilitation, alternative housing, & other community services. However, in other cases, these choices were made without regard for any preparation or assessment of requirements of patients who were to be relocated or deinstitutionalized. Neither nature of services to be given nor characteristics of areas where patients would be transported were apparent. As result, rather than basic scientific thinking, most judgments were based on rhetorical & political convictions. Deinstitutionalization as concept & policy has received both acclaim & criticism. Deinstitutionalization is viewed by some as intelligent, progressive, & humane set of policies that has put needs of mentally ill at forefront of many communities. Deinstitutionalization has shown to be quite helpful in this area. Deinstitutionalization is credited with increasing patient involvement in their own care & rehabilitation, raising questions that challenge therapeutic nihilism prevalent in previous eras, increasing visibility of mental patients in community as well as in general hospitals & academic centres, & allowing for better understanding of disease.

Controversies In Ethics-The field of forensic psychiatry is riddled with ethical difficulties across world due to its dual function in health & law. Forensic psychiatrist is first & foremost clinician with theoretical & practical understanding of general & forensic psychiatry, as well as expertise making reasonable judgments based on well-defined scientific foundation. In order to practise law, forensic psychiatrists must be familiar with legal definitions, laws & procedures, & precedents pertaining to subject or issue at hand. Forensic psychiatrists must be familiar with judicial procedures & must be able to express their conclusions clearly & concisely, even when confronted with challenging scenario of cross-examination. Subspecialty of forensic psychiatry is defined by dual understanding of psychiatry & law, which offers ethical basis for its practitioners. This dual understanding should be represented in manner forensic psychiatrist agrees to participate in examination, manner forensic psychiatrist approaches person to be examined, & cautions that must be supplied from start. most important issue for forensic psychiatrist at this point is to ensure that person being evaluated is not misled into believing that, because psychiatrist is medical doctor, relationship that will unfold is one of physician-patient, in which doctor is expected to do everything possible for patient & always act to maximize patient's benefit, while reassuring patient. Connection in forensic psychiatry is one of evaluation, with evaluator's impartiality expected & reality that evaluator is unable to comfort individual on grounds of secrecy or privacy. As result, forensic psychiatrists may be held responsible for criminalization of mentally ill people. According to some observers, forensic psychiatrists' social control function distinguishes them from medical & psychiatric ethics. These critics are split on whether forensic psychiatrists are practising medicine in their legal work, point of view that has sparked significant debate. From inception until court appearance, forensic psychiatrist gets authorization to act from fact that he or she is first & foremost physician, therefore bound by medical ethics, although final results of forensic evaluations are frequently in hands of other parties. In this setting, forensic psychiatrists & clinicians in general cannot overlook end-goal motives of persons seeking assessments. Participation in anything that might lead to torture will be serious breach of medical ethics. This should also serve as strong reminder to forensic psychiatrists that medical ethical principles must be followed no matter what master's expectations are. [8]

A review of literature on Trends in forensic occupational therapy:-Forensic psychiatry is difficult discipline to work in, with variety of complicated challenges that personnel must deal with. Many developments have occurred in providing of services to mentally ill criminals during last two decades. Trends for future advancements are beginning to appear, just as they do in other sectors of practise. What role has occupational therapy had in field of forensic psychiatry? study of forensic occupational therapy literature was conducted to answer this topic. occupational therapy position, areas of practise, media usage, client groups, treatment programmes, and models of practise, research, & education are just few of topics that occupational therapists have tackled.

The function of occupational therapy:-The role of occupational therapy has been documented in prisons, where it appears that occupational therapists play minor role. Occupational therapists, on other hand, are recognised as having potential to play larger role, particularly in pre-release stage. function of occupational therapy in specialised forensic psychiatric hospitals has also been discussed, with emphasis on full evaluation before devising customised programmes for clients. Occupational therapists have also spoken about their roles in forensic psychiatry, as expert witnesses, & in social security disability & compensation. Occupational therapists describe variety of duties, most of which appear to be fairly specialised. literature on function of

occupational therapists in areas such as aftercare, community services, & maximum security & special hospitals is lacking. [9]

The application of media:-The utilisations of media reports are divided into two categories. Occupational therapists have first considered expressive arts, such as art therapy & creative self-expression via poetry as therapeutic tool. With clients who struggle with verbal self-disclosure, expressive arts have been employed as adjunct to improve self-exploration & self-expression. Second, occupational therapists have investigated use of particular modality with forensic psychiatric patients. This has taken many forms, including use of films & literature to increase empathy in sexual offenders for their victims, use of video to develop work-related abilities, & use of cooking as activity to help offender clients gain competence & sense of control. use of more traditional media, such as crafts or socialisation activities, as therapeutic modality with this client group has received less attention. [10]

Models of behavior:-Although it may seem that forensic psychiatric models of practise would be essential topic for occupational therapists to study, research shows that relatively little has been written in this field. Following is model of human occupation suggested by useful method of looking at process of supporting mentally ill offenders in achieving personal objectives in respect to themselves & others in variety of environments. It is critical in practise of forensic psychiatric occupational therapy that it be based on specific theoretical viewpoint that considers requirements of clients & is compatible.

Occupational therapy implications:-There is evidence of expansion & development of occupational therapy in this new field of practise in last two decades of occupational therapists reporting on their work in forensic psychiatry. What are consequences for occupational therapy based on tendencies that have been identified if this momentum is to be maintained? Education, practise models, assessment, research, outcome measurements, & publication are among areas that author believes need to be addressed. [11]

Providing possibilities for education:-Colleges & universities should give possibilities for students to pursue forensic psychiatric courses. This is best handled in multidisciplinary setting, where students may learn about responsibilities of different health professionals in field. Practicum's should be given in conjunction with this to allow students to have first-hand experience working in forensic context. This would help debunk some of stereotypes surrounding forensic work & provide students information they need to make educated decisions about whether or not to pursue career in this field. In addition, post-qualification courses & training in forensic psychiatry should be made available so that those working in field can expand their expertise. This would have variety of advantages, most notable of which is that it would boost staff confidence in delivering service, assisting in staff retention & enhancing profile of occupational therapy. [12]

Examining evaluations:-Assessment aids occupational therapists in assessing their clients' advantages & shortcomings. Development of individualized, needs-based treatment regimens is therefore possible. Occupational therapy evaluations have been established for use with number of client demographics & are accessible in number of formats. Occupational therapists in forensic psychiatry may need to investigate these evaluation methods to see which ones are most successful in forensic environment.

Creating outcome metrics:-In health care, outcome indicators are becoming increasingly relevant. To progress profession of occupational therapy, it is vital to develop outcome metrics. Outcome metrics are helpful in demonstrating efficacy of therapeutic interventions & thereby

improving care quality. They enable therapist make educated practise decisions, which aids in demonstrating efficacy of occupational therapy to other caregivers & funding sources. [13]

CONCLUSION:-Occupational therapists who work with mentally ill criminals have several hurdles. In this particular field of practise, it is moment of growth & change, with potential for occupational therapists to make major contributions to changes taking place. On subject of ethics, we've addressed controversies that forensic psychiatrists' expanded scope of practise has created in understanding of their social functions, ranging from definitional issues to debates over whose ethics they should follow, to most recent concerns about use of clinical knowledge for purposes that should be completely outside of their ethical boudoir. Forensic psychiatry has taken on more prominent position in society as result of its practitioners. They now have responsibility to ensure that they stay top physicians & that their ethics & goals are impeachable. [14]

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The physicochemical properties of water and their importance for life

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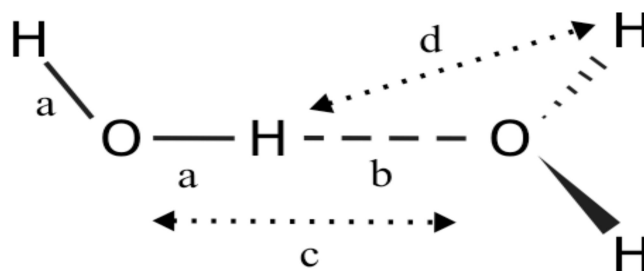
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Abstract:- Water as a component of organic and inorganic substances and as a solvent, reaction and transport medium is very important in all a biotic and biological processes on Earth. Because water has the ability to create hydrogen bonds between molecules, it has a number of unique physicochemical properties that are important for energy and computational materials in ecosystems. This chapter provides an overview of the most important physicochemical properties of water and their importance to life on Earth.

Introduction:-Water is one of the most abundant natural substances. It is an integral part of all animal and plant matter and contains about 75% of the earth's crust. The human body contains about 70% water. All body mechanisms in animals and plants depend on water because the medium, if the hardness of groundwater is too high, causes several human diseases such as kidney, heart, nervous system problems, etc. Therefore, groundwater quality analysis is very important. Currently, most countries (accurately) analyze the drinking quality of groundwater. No literature review on water quality analysis has been carried out. In general, calcium is important for the human body, but it contains too much human calcium, which causes several human diseases such as urinary tract problems, heart problems, coma and death when serum calcium levels rise to 160 mg/100 ml. According to the NRC report (1977), fifty studies in nine countries showed a statistically consistent relationship between drinking water hardness and cardiovascular and kidney problems.

Different forms of water:-Water – with its formula H_2O – is the only inorganic compound existing in its solid, liquid and gaseous physical state under natural conditions. Water serves as a medium for the transformation of highly complex organic molecules that form the basis for life processes. The reason for many of liquid water's special properties originates from the water molecules consisting of dipoles that associate through intermolecular hydrogen bonds in its condensed phase.

Hydrogen bonding:-This type of bond is of fundamental significance for the development of life and life processes. The uniqueness of water compared to other – also hydrogen bonded – liquids is the existence of a three dimensional network. This causes particularly strong intermolecular interactions between water molecules in their condensed phase. Among all bond types, Linus Pauling ascribes the greatest significance in physiology to the hydrogen bond. A hydrogen bond can form if two atoms X and Y – in general very electronegative elements like fluorine, oxygen or nitrogen – are connected to a group $X-H\cdots Y$ through a hydrogen atom. In this arrangement, the hydrogen atom is located asymmetrically and bound stronger by one of the atoms, e.g. X, instead of being situated half way between both other atoms. The hydrogen atom, however, does penetrate the electron cloud of the atom Y to a certain degree. Typical bond energies of hydrogen bonds are 20 kJ/mol – about a quarter of the bond energy of a covalent bond – and bond distances are between 0.25 and 0.3 nm. In the case of hydrogen bonds in water, different experimental methods have yielded bond energies between 19 and 22 kJ/mol. As such, the almost linear $O-H\cdots O$ arrangement of a water dimer, as it exists in ice is also energetically very favourable in the liquid phase.



Physicochemical characteristics

Various anomalies of water at temperature ranges of up to 100 °C are a result of hydrogen bonding. Some important properties are listed in *Table 1.2-2*.

When comparing these properties to those of atomic or non-hydrogen bonded molecular liquids of similar molecular size some particularities are noteworthy:

- The melting point of ice is exceptionally high if compared to the decrease in melting points with decreasing atomic number among the hydrides of the sixth main group.

Water shares this behaviour with various hydrides and halogenides of the 4th, 5th, 6th, and 7th group. Among these groups, the first elements show extremely high melting and boiling points.

- During the melting of ice at atmospheric pressure, the volume contracts by 8.2%. This anomalous contraction of volume – most substances expand during melting – leads to a decrease in freezing point with increasing pressure: »ice melts under pressure. At 0 °C the freezing point is decreased by 1 °C with a pressure of 1.33×10^7 Pa.

- The dependence of liquid water's molar volume on pressure and temperature exhibits extremes. The density of liquid water has a maximum at 3.98 °C.

The thermal expansion coefficient α of liquid water is one order of magnitude smaller compared to other molecular liquids. The isothermal compressibility c_T shows that for molecular liquid water is rather incompressible.

- The dynamic viscosity of water is higher than that of comparable, non-hydrogen bonded liquids. Furthermore, the pressure dependence of the viscosity is anomalous: the viscosity decreases with pressure and reaches a minimum at about 60 MPa (this pressure is equivalent to a water column of 6 km).

- Water's surface tension is higher than that of other liquids, including most other hydrogen bonded liquids.

- Within a temperature range of up to 130 °C, liquid water's thermal conductivity increases with increasing temperature.

- Liquid water possesses a high specific heat capacity at constant pressure, which changes only slightly up to 100 °C.

- The enthalpy of evaporation $D_{vap} h$ of water is anomalously high. Similar to the specific heat capacity, $D_{vap} h$ is almost four times as high as those for other comparable, non hydrogen bonded liquids. This difference is ascribed to the hydrogen bond. In addition, the enthalpy of evaporation of water is very high compared to its enthalpy of melting.

The fact that water expands while freezing has led, amongst other consequences, to our familiar picture of nature, e.g.: Water easily penetrates rock crevices. When it freezes, the rock is further disrupted, physical and chemical weathering occurs, and, ultimately, soil is formed. The fact that water exhibits its highest density at 4 °C, but not at its freezing point, is essential for the thermal stratification and the circulation of lakes. This leads to the freezing of water bodies from their

surface towards the ground. Not only is this of importance for aquatic life of inland waters, but it is also crucial for the oceans. If the colder regions of the oceans were to freeze from the bottom to the top, energy received by the sun's radiation during summer would only be sufficient to thaw the uppermost layers. Thus, the cycling of energy and matter which relies on the circulation of the oceans would cease partially or even completely.

The universal solvent:-Due to its polar nature, water is a good solvent for salts, polar organic compounds, and gases. During the hydrological cycle, water communicates directly with solid phases such as dust, soil, rock, and living organisms. Thus, all water that has been in contact with water is reflected in the chemical composition of the water. Water dissolves various substances very efficiently. This is one of the reasons why almost all biochemical reactions occur in aqueous solutions and why water is an important reaction medium in all metabolic processes in living cells. A solution containing two or more components is a homogeneous liquid phase. Aqueous solutions are characterized by extensive interactions between solute molecules and water molecules. Depending on the type of solution, different interactions can be observed. It refers to the type of interaction and the effect of this effect on the structure of the water around the solution.

Dissolution of organic substances:-Most organic substances are not electrolytic and occur as molecules that dissociate with water. Polar and non-polar organic substances have different decomposition mechanisms. Non-polar molecules, such as hydrocarbons, are found in the existing intermolecular spaces due to the tetrahedral configuration of water. In general, this process results in an improvement in the structure of the water. There are more hydrogen bonds near the dissolved molecule than further away. This "improved" structure of water results in a relatively low solubility of non-polar organic compounds. This has practical implications for water pollution by crude oil, pesticides, drugs and other xenophobia. The concentration of this solution is usually below the mg/l range.

Dissolution of gases:-As a consequence of ample contact between water and the atmosphere within the hydrological cycle, the components of the air, especially the gases nitrogen, oxygen and carbon dioxide, will dissolve in water. The solubility of gases in water can be described by HENRY-DALTON's law with sufficient accuracy in most applications:

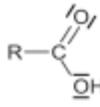
$$c_i = K_H \times p_i$$

c_i = concentration of gas i in water in mol/m³,

p_i = partial pressure of gas i in the gas phase in Pa,

K_H = HENRY-constant in mol/(m³×Pa).

Dalton's law states that in the equilibrium state the concentration of a gas in solution is proportional to the partial pressure of this gas above the solution. The Henry constant generally decreases with temperature resulting in a lower solubility of the gas. The less important dependence of the constant on pressure and salinity can be neglected for most practical calculations. According to the law for ideal gases, the partial pressure p_i of a gas is the product of the partial volume of the gas and the total pressure. The concentration c_i in water can then be calculated in an equilibrated state by using the partial pressure p_i . The resulting concentration is given in the units of mol/m³. In order to convert this result into the more frequently applied units of g/m³ (= mg/L), the concentration has to be multiplied by the molar mass M_i of the dissolved gas i .

Group (compound)		PD	PA
Water	$\text{H}-\overline{\text{O}}\text{H}$	2	2
Hydroxyl-	$\text{R}-\overline{\text{O}}\text{H}$	1	2
Carbonyl-	$\text{R}_2\text{C}=\overline{\text{O}}$	0	2
Carboxyl-		1	4
Amino- (primary)	$\text{R}-\overline{\text{N}}\text{H}_2$	2	1
Amino- (secondary)	$\text{R}_2\overline{\text{N}}-\text{H}$	1	1
Amino- (tertiary)	$\text{R}_3\overline{\text{N}}$	0	1

Reaction diversity

The most important function of liquid water for life processes is its role as reaction medium for a great variety of soluble substances. Not only are they distributed, but they can diffuse towards and react with each other.

The reactions can be separated into:

- Acid-base reactions
- Redox reactions
- Complexation
- Sorption/desorption reactions
- Condensation/hydrolysis

During such reactions, either hydronium ions (H_3O^+), electrons (e^-) or electron pairs are transferred or water molecules are exchanged, and phase transitions (liquid/solid) occur. Additionally, many reactions are accelerated due to catalytic effects. This includes photocatalytic as well as biochemical transformations through enzymes.

Conclusion

The basic importance of water for life has always had a fundamental impact on mankind. This includes its important role in life, as well as fascination and myth. Water passes through canals through human development. However, appearance, availability, characteristics and behaviour are almost changed clear to us. We must confront these developments and bring back awareness of the unique nature of water and our responsibility for its sustainable use

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The impact of video assist teaching module regarding prevention and management of Osteoarthritis among geriatric women in Selected Area Gorakhpur (UP)

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ABSTRACT:-Joint inflammation is normal yet not surely known. As a matter of fact, "joint pain" is certainly not a solitary sickness; it is a casual method for all using to joint to mentor joint sickness. There are in excess of 100 unique sorts of joint pain and related conditions. Individuals all things considered, sexes and races have joint pain, the main source of handicap in the United States. Basic joint inflammation joint manifestations incorporate swelling, torment, firmness and diminished scope of movement. Manifestations may travel every which way, and can be mellow, moderate or serious. They may remain about the equivalent for quite a long time however may advance or deteriorate after some time. Serious joint inflammation can result in constant agony, failure to do every day exercises and make it hard to walk or climb stairs. Joint inflammation can cause perpetual joint changes.

Keywords: - Osteoarthritis, Joint pain, Infection, Test, Geriatric women

INTRODUCTION:-Osteoarthritis can be an intense and amazingly crippling ailment, while it is regularly thought of as just a sickness that can influence genuine, Osteoarthritis can really be found on individuals of all ages. Since there are in excess of 100 various types of Osteoarthritis, one of the key pieces of treatment is to effectively recognize what sort of Osteoarthritis is available. There are even a few kinds of Osteoarthritis, which are identified with psoriasis and result in layered flaws on the skin. Osteoarthritis can likewise influence mind-set, making individuals feel uneasy, worn out or stressed. It very well may be totally startling to have nothing amiss with one day and extreme. Osteoarthritis is certainly not another illness and much research has been done is as yet being done to discover a fix. This progressing examination is financed by The Osteoarthritis Society. They track inquire about preliminaries and the most recent leaps forward on the restorative front. A few indications of aggravation incorporate redness, warmth, torment, and swelling. These issues are revealing to us that something isn't right. Joints are where two ones meet, for example, your elbow or knee. After some time, in certain sorts of Osteoarthritis yet not taking all things together, the joints included become seriously harmed. Its genuine that can be excruciating. Be that as it may, there are things we can improve. One of the most widely recognized issues experienced by the individuals these days is obviously Osteoarthritis. This is a note worthy issue that really comes in various structures. Osteoarthritis is the most widely recognized reason for constant inability. There are no strategies to solution for most types of Osteoarthritis. Be that as it may, with some exertion we didn't need to lo development in your joints.

OSTEOARTHRITIS IN GERIATRIC WOMEN IN RURAL AREA IN UP:-The one thing they share for all intents and purpose is they happen more much of the time in females than guys—25.9 percent of ladies have joint inflammation rather than 18.3 percent of men. The grown-up type of lupus influences ladies somewhere in the range of eight and multiple times more than men. In spite of the fact that there are a few intimations with respect to why ladies are

progressively helpless to immune system maladies (in which the safe framework erroneously assaults and obliterates sound tissue) than men, the definite reasons are obscure. Science, hereditary inclination, condition and hormones are altogether thought to assume a job in the advancement of joint inflammation. Overtime, RA can make joints distort and move strange. Exhaustion, fever and weight reduction are likewise manifestations of them a lady. Ladies have two-to-multiple times higher paces of foremost cruciate tendon (ACL) wounds, a hazard factor for the improvement of knee Osteoarthritis. The ACL is one of four notes worthy tendons of the knee and is one of the most ordinarily harmed knee tendons.

NEED OF THE STUDY:- Ruler (2010) evaluated that Osteoarthritis influence over 30% of individuals over the time of 65years. The influenced people in the age gathering of 65years or more are anticipated as about 21.4million in 2001 and it is evaluated that constantly 2030, 41.4 million individuals would be influenced by Osteoarthritis. It was likewise noticed that ladies (37 .3%) are increasingly inclined to Osteoarthritis when contrasted with men. Who (2008), revealed commonness of Osteoarthritis on the planet as1% however they rate fluctuates among the age gatherings? Roughly 2.1 million individuals in the US endure, of which1.5 million are laborers. Osteoarthritis is found in all age gatherings, and it happens multiple times more in ladies than men. Osteoarthritis establishment (2007) revealed the pre dominance pace of Osteoarthritis in the nearby relatives changes from 2% to 3%. Osteoarthritis influences all individuals, regardless of age, race and economic wellbeing. There are at present 580 million older matured 60 and over on the planet and of these 365 million live in the creating nations. Inside east 50years the pace of quickened passing in creating nations has noticeably diminished and future during childbirth has expanded from 41years in 1950s to 62 years in 1990.As future expands, the occurrence of constant infections particularly Osteoarthritis among half of populace in terminable sickness or issues expanded. The illness turns out to be more pervasiveness after the period of 45years, around 6million individuals are analyzed and in appropriately self-treated. Today due to the socio-social changes the joint family example has changed to atomic ones. What's more, regardless of whether there is a joint family the individuals are limited to 4 or 5. This has made incredible effect on the seniority individuals as they are disregarded because of the advanced education and very much settled employments of youngsters in abroad and now a day, even with the females working, they get no consideration by any means. Since them youngsters are away and no body to think about them, they feel desolate, become discouraged and worried about their medical issues significantly more. With the assistance of organized training system like this we can ready to give the learning in regards to Osteoarthritis, its hazard factors, how to avoid the further intricacies and to oversee by their own.

STATEMENT OF THE PROBLEM

“The impact of video assist teaching module regarding prevention and management of Osteoarthritis among geriatric women in selected area Gorakhpur (UP)”.

OBECTIVE

1. To survey the degree of information on hazard variables, inconveniences and avoidance of Osteoarthritis among the chose populace who are dwelling at Gorakhpur.
- 2.To assess the viability of organized showing program on hazard elements, intricacies and counter active action on Osteoarthritis among the chose populace who are dwelling at Gorakhpur.

3. To investigate the relationship between those statistical factors with learning score among the chosen population who are dwelling at Gorakhpur.

HYPOTHESIS

H1-There will be critical differentiation between the pre and post test learning scores regarding risk factor, complexities and neutralizing activity of Osteoarthritis among the people.

H2-There will be a basic connection between post test data scores with their picked measurement factors.

DELIMITATION

Samples were limited to 100 individuals. The time of the assessment was limited to about a month and a half.

FORESEEN OUTCOME

The result may be reasonable for coordinating structure indicating venture of learning of peril segments, complexities and expectation of Osteoarthritis among the picked people.

RESEARCH METHODOLOGY:

RESEARCH APPROACH; In this investigation a quantitative evaluator approach used to survey the viability of organized showing program on hazard components, entanglements and counter active action measures among the individuals.

RESEARCH DESIGN:- Semi exploratory plan in which one gathering pre test and post test configuration approach is utilized to survey the adequacy of organized educating program.

SETTING OF THE STUDY: The study is led at Gorakhpur, U.P. Population Individuals maturing 60 years or more who are living at Gorakhpur village, U.P region.

SAMPLE SIZE: 100 People dwelling in Gorakhpur, U.P local e, during the time of information gathering are chosen as tests.

SAMPLING TECHNIQUE: -Basic arbitrary testing procedure is utilized.

CRITERIA FOR SELECTION OF SAMPLE

Incorporation criteria

- Age above 60 years.
- Who are willing to participate in the study?
- Who are dwelling at Gorakhpur?

Prohibition criteria

- Age below 60 years.
- Who are not willing to participate in the study?
- Who are not dwelling at Gorakhpur?

INSTRUMENT FOR DATA COLLECTION

The researcher built the Instrument dependent on the targets of the investigation through 1 direction. The information accumulation is determined the accompanying heading statistic variable, by polytechnique.

Section -1: This area comprises of data about statistic factors, for example, age, sexual orientation, religion, training status, kind of family, conjugal status, month to month pay of the family, occupation status, well spring of salary, well spring of well being data. **Section 2:** This area manages survey for evaluation of learning with respect to street security. It comprises of 30 numerous decision addresses identified within formation in regards to hazard elements, complexities and avoidance of Osteoarthritis among individuals. Each right answer would be offered the score of one and an inappropriate response would be given the score of zero. The absolute conceivable score would be 30.

Information Collection: The investigation was led in panchayat association Gorakhpur, U.P area. The information was gathered for a time of about a month and a half by utilizing there a died devices. The apparatuses had been created dependent on the investigation and through survey of writing.

Report of Pilot Study: The pilot study was led to evaluate the dependability, practicability assent worth and plausibility of the apparatus. The examination was directed in town. Ten individuals who met consideration criteria had been chosen by straight forward irregular examining system. The degree of information in regards to Osteoarthritis was surveyed withtheorganizedpolls.Theorganizedinstructingprojectwasgiventoupgradelevelofinformation of individuals with the assistance of instructive model of outlines and stance through talk cum discourse technique. Following 7 days post test was directed to similar individuals. The aftereffect of the pilot study demonstrated that there was a note worthy improvement with respect to learning of hazard variables, difficulties and counter active action of Osteoarthritis among the chose populace.

Ethical consideration: The research boards of trustees before the pilot concentrate affirmed the examination proposition. Authorization was gotten from the panchayat leader of Gorakhpur, U.P region. The oral assent from individuals was gotten before beginning the information accumulation. Confirmation was given that secrecy would be kept up.

Plan for Data Analysis: The information had been sorted out, classified and dissected by utilizing distinct insights. Mean, standard deviation test was carried and out paired to evaluate the adequacy of organized educating program. Chi-square test was utilized for the relationship of statistic factors with level of learning in regards to information of hazard variables, intricacies and counter active action of Osteoarthritis among the chose populace.

Result of Demographic: Out of 100 individuals, 50 (half) were matured between 60-65 years, 24 (24%) were in 66-67 years, 18(18%) were in 68-70years and 8(8%) were over 70 years. With respect to, 57 (57%) were male, 43(43%) was female. With respect to the religion of the individuals 70 (70%) were Hindu,18(18%) were Muslim and12 (12%) were Christian and Others 0 (0%). Concerning status of the individuals 44 (44%) were uneducated, 40 (40%) were elementary school, 10(10%) were secondary school and 6(6%) was graduate. Sorts of family uncovers that 44 (44%) were in family unit, 56 (56%) were joint family. With respect to the conjugal status 78 (78%) wedded, 3(3%) unmarried, 19(19%) were bereft and nobody was separated. Worried with the month to month pay of the family, 40 (40%) were in Rs1000-Rs2000,42(42%) were in Rs.2001-. Rs3000,8(8%) were in Rs3001-Rs 4000 and 10(10%) were above Rs4000. With respect to status, 24(24%) were doing farming, 64(64%) were getting day by day compensation, 6(6%) were representative and 6(6%) were experts. Concerning well

spring of salary, nobody was retired person, 16(16%) were under government help, 40(40%) had property, 44(44%) were relying upon others. As to of wellbeing data, 45(45%) getting from media, 41(41%) from wellbeing experts, 14(14%) getting data from companions and relatives.

RESULTS AND DISCUSSION: The examination was directed for a time of about a month and a half by utilizing semi trial research structure at Gorakhpur, test had been chosen by straight forward irregular inspecting procedure strategy. The testing size was 100. An all-around detailed organized poll was utilized to evaluate the information of Osteoarthritis. Pre test and organized training system was done on the principal day. On the eighth day by utilizing the organized surveys strategy post test was done. The information examination demonstrated that among 100 individuals 31 (31%) had decently sufficient learning, 69 (69%) had lacking learning. In pretest the general mean was 13.78 with 3.338 standard deviation. It uncovers that, individual's need instructive program to improve their insight about hazard elements, difficulty and counter active action of Osteoarthritis among the individuals.

The subsequent target was to assess the viability of organized showing program on learning of hazard variables, complexity and counteractive action of Osteoarthritis. Demonstrates that, in post test, most of the individuals 94(94%) had sufficient information, 6 (6%) individuals had respectably satisfactory learning and none of them was in lacking learning. The general mean of learning in regards to Osteoarthritis in post test 26.220 with the standard deviation of 2.067. The improvement score of mean worth was 12.440 with the standard deviation of 3.843 and the „t“ test value which was as statistically.

CONCLUSION: The present examination was directed to overview the practicality of learning on risk components, disarrays and expectation of Osteoarthritis among the picked people in Gorakhpur. Semi exploratory research design was used for this examination. 100 people who met thought criteria had been browsed Gorakhpur by using clear subjective analyzing technique. The authority initially familiar himself with the people and developed a similarity with them. The pre test was driven with the survey given to the people concerning learning of Osteoarthritis. Following seven days the post test was coordinated by using same appraisal gadget. The data accumulated had been collected and examined by using illustrative experiences and inferential estimations. In pretest out of 100 people, 69(69%) people had lacking learning and 31 (31%) had bearably adequate data. In posttest 6 (6%) had humbly Adequate data and 94(94%) had agreeable learning. The „t“ value was compared 32.365 with ordered table a motivating force at the level of $P < 0.05$ was tremendous. So, it is assumed that the composed demonstrating program on data of danger components, complexities and repugnance of Osteoarthritis was convincing.

NURSING IMPLICATIONS: The revelations of the assessment have recommendations in different pieces of nursing that is nursing deal with, nursing preparing, nursing association and nursing research, by assessing a level of people data as for peril components, complexity and neutralizing activity of Osteoarthritis.

RECOMMENDATION FOR NURSING PRACTICE: Educating and making care is a crucial bit of the nursing organization. In light of the finding of this examination sorted out empowering framework can be made game plans for the medicinal chaperons to extend the learning of peril components, disarray and revolution.

PROPOSAL FOR NURSING EDUCATION: Nurse as an educator accept a vital activity in

teaching the people as for data of peril factors, disarrays in addition, repugnance of Osteoarthritis. So the medicinal guardian educator must be told about the learning of Osteoarthritis and its methods in order to present the data to the people.

RECOMMENDATIONS FOR NURSING ADMINISTRATION: - With pattern setting

Advancement and reliably creating troubles of human administration's needs. The school and center association, have an obligation to give orderlies, support instructors and medicinal overseer under studies with continuing with preparing on late types of progress in Osteoarthritis. This will engage them to invigorate their understanding and aptitudes.

PROPOSALS FOR NURSING RESEARCH: There is a prerequisite for genuine and expansive research around there. It opens a note worthy street for research on inventive methods of making care, headway of empowering material and setting up blended media networks for teaching and for making care among the understudies, restorative orderlies, open and other human administrations specialists.

RECOMMENDATIONS

In light of the assessment revelations the going with recommendations can be made:

- The same examination can be imitated on a greater mode land more over at different settings.
- A close to examination should be conceivable between semi-common and semi-urban social orders.
- An enchanting report can be conducted one valuation of learning as for Osteoarthritis.
- A sorted out preparing program on Osteoarthritis can be prepared and given to archers to frame information in to the at they can and influence data to all school under studies.
- The composed empowering venture on learning of blood blessing can be appeared to the tea can concede data to all school understudies.

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Effectiveness of scheduled nursing interventions on skin integrity among patients with pitting oedema in selected hospitals in Bangalore.

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Abstract :- Chronic oedema is a complex, long term condition which can affect individuals on many levels. Body image is an important issue that can have implications on patients and the ability to adjust to living with a long term chronic condition, accept appropriate treatment, and remain motivated in their self-management program. Determine the effectiveness of scheduled nursing interventions with the scores of skin integrity among experimental and control groups in the post-test. Explore the association with the scores of skin integrity among experimental and control groups with selected demographical variables. The evaluative approach was adopted for the study. Purposive sampling technique was used to select samples, and the sample size was 40 lower leg pitting oedema patients. Observational checklists, developed by the researcher, were used to collect data from pitting edematous patients. The study helped the lower leg pitting oedema patients to improve skin integrity outcomes. The study helps the lower leg pitting oedema patients to change towards more favorable skin integrity outcomes. Therefore it is concluded that scheduled nursing interventions on "skin integrity outcomes of lower leg pitting oedema patients" were useful in terms of decreasing the skin integrity problem among lower leg pitting oedema patients.

Key Words:- Nursing intervention, Lower Leg, Pitting Oedema, ,Skin Integrity

INTRODUCTION:-Peripheral lower extremity oedema may result from venous disorders, trauma, and specific bone and cardiac disorders that disturb the healthy fluid balance. It may also result from nephrotic syndrome, cirrhosis, and liver failure, acute and chronic renal failure, right-sided heart failure, renal disorder, rheumatic arthritis and acute or chronic thrombophlebitis, chronic venous insufficiency, cellulitis, lymphoedema, and the use of certain drugs. However, several nonpathological mechanisms may also cause leg oedema. For example, prolonged sitting, standing, or immobility may cause bilateral orthostatic oedema. It often presents with symptoms of fullness, tightness, or heaviness in an extremity, altered sensation, and inability to wear tight garments and may report clothing feeling tight on the affected side. These patients may or may not have visible swelling of the affected extremity, but further evaluation may detect extremity girth differences—a difference of two centimetres or more at any measurement point, between subsequent girths of leg oedema. Patients with less of a measurement difference between their extremities was benefits from skilled therapy interventions as well, especially if they present with reduced ROM, strength, and functional limitations. Treatment is beneficial for any patient who risks for the future development of leg oedema to become independent in risk reduction strategies and to initiate a home exercise program and to provide a safe, effective progression of their daily or recreational activity. Nurses are increasingly at the frontline in supporting patients in the management of long-term conditions. They are, therefore, likely to be involved in identifying and providing care for people who are affected by chronic lower extremity oedema. Nurse practitioners will need to develop the skills to recognize patients who have or are at risk of developing oedema. Aspects of the nursing assessment include taking a detailed history and conducting a comprehensive physical and psychosocial assessment of the impact of this

condition. The assessment is multifaceted and will often require intervention from other members of the multidisciplinary team. Most studies have demonstrated that peripheral oedema is a common finding in clients with the cardiovascular problem. Bilateral oedema of the legs may be seen in clients with heart failure or chronic renal insufficiency. Abdominal and leg oedema can be seen in client with heart disease and cirrhosis of liver. Appropriate skin care and prevention of infection are essential cornerstones of effective leg oedema management, which can play a vital role in patient comfort and acceptance of swelling. Management of the patient or client with leg oedema requires input from an appropriately qualified and skilled practitioner. However, skincare is one area of care, which may be addressed by all levels of healthcare professionals involved in direct patient care. The investigator had exposure to many patients with oedema who were manifested with heaviness, swollen, weight gain, scaly, flaking, cracking and redness in the affected extremities. The investigator also found that health practitioner giving more importance to treat abdominal or sacral oedema, facial oedema than the peripheral leg oedema. Also, it was treated only with the corticosteroids and diuretics. Initially the oedema is soft, pitting and relieved by treatment as the condition progress the oedema become firm, pitting and unresponsive to treatment. Investigator also found that there are very few clinical relevant articles on leg oedema and its skin care. For this reason, the investigator felt that there is a need for long term interventions to preserve skin integrity among chronic oedematous patient.(7)

II. Materials and Methods: The conceptual framework of the study was modified by the investigator based on Imogene King's goal attainment Model. The study adopted an evaluative approach with a pre-experimental with non-equivalent control group post test only design was used.

Group	Intervention (Every 4 th hourly for about 3 days)	Post-test (At fourth day)
Experimental group: 20	X	O ₁
Control group:20	-----	O ₂
	(Independent variable)	(Dependent variable)

The researcher selected non- equivalent group design because of the feasibility, availability of the sample, and also to avoid confusion.

O₁: Assessment of skin integrity on the fourth day by using an observational checklist in the experimental group.

O₂: Assessment of skin integrity and on the fourth day by using observational checklist in the control group.

X: Administration of scheduled nursing interventions to the experimental group every 4th hourly for 3 days.

III. RESULTS:-Data was analysed by descriptive and inferential statistics and interpretation of the data collected in order to determine the effectiveness of scheduled nursing interventions on skin integrity in 40 lower leg pitting oedematous patients (20 experimental group and 20 in control group).

TABLE – 1: Classification of Subjects by Reasons for pitting Oedema, Treatment and Frequency of Diuretics administration

Characteristics	Category	Subjects					
		Control Group (n=20)		Experimental Group (n=20)		Combined (n = 40)	
		n	%	N	%	N	%
Reasons for pitting Oedema	Renal failure	4	20.0	5	25.0	9	22.5
	Liver failure	5	25.0	6	30.0	11	27.5

	Right sided heart failure	5	25.0	4	20.0	9	22.5
	Rheumatic arthritis	6	30.0	5	25.0	11	27.5
Patients under Treatment of Diuretics	Yes	20	100.0	20	100.0	40	100.0
	No	0	0.0	0	0.0	0	0.0
Frequency of Diuretics administration	Once a day	8	40.0	4	20.0	12	30.0
	Twice a day	9	45.0	15	75.0	24	60.0
	Thrice a day	3	15.0	1	5.0	4	10.0

Table-1 depicts that the majority of lower legs pitting oedema patients 30.0% were due to rheumatic arthritis, 25.0% due to liver failure and right sided heart failure and 20% of patients were due to renal failure in control group. Where as in experimental group majority of lower leg pitting oedema patients 30.0% were due to liver failure, 25.0% due to rheumatic arthritis and renal failure and 20% of patients were due to right sided heart failure. The majority of lower legs pitting oedema patients 100.0% were received diuretics medications in both experimental and control group. The majority of lower legs pitting oedema patients 45.0% were received diuretics twice a day, 40% were received once in a day and 15.0% were received thrice a day in control group where as in experimental group 75.0% were received diuretics twice a day, 20.0% were receives once in a day and 5,0% received thrice a day.

TABLE – 2: Over all Mean scores of Skin Integrity among Experimental and Control Group

Respondents	Sample (n)	Statements	Max. Score	Skin Integrity scores			Student ‘t’ Test
				Mean	Mean (%)	SD	
Control Group	20	17	68	33.10	48.68	8.3	4.59*
Experimental Group	20	17	68	24.85	36.54	8.5	

Table-2 depicts the distribution mean score of skin integrity regarding control and experimental group. The mean skin integrity score was 48.68% with standard deviation 8.3 in control group. Where as in the experimental group mean skin integrity score was 36.54% with standard deviation 8.5. The same data is represented in the form of graph in figure-1.

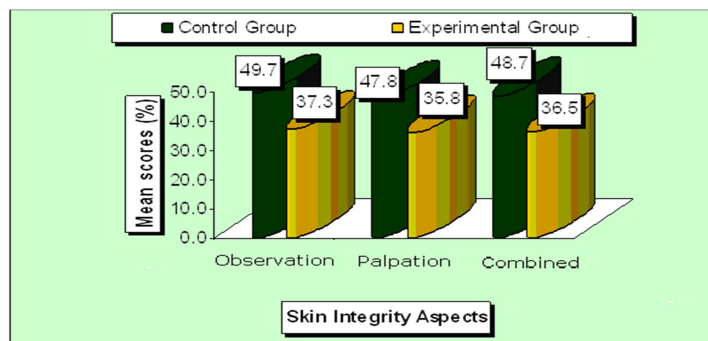


Figure-1: Over all mean scores of Skin Integrity among Experimental and Control Group

TABLE – 3: Over all aspects wise post test Mean scores of Skin Integrity among Control and Experimental Group.

Skin Integrity Aspects	Statements	Subjects Scores (%)				Student 't' Test
		Control Group (n=20)		Experimental Group (n=20)		
		Mean	SD	Mean	SD	
Observation	8	49.7	9.2	37.3	10.9	3.89*
Palpation	9	47.8	8.2	35.8	6.9	5.01*
Combined	17	48.7	8.3	36.5	8.5	4.59*

* Significant at 5% level, $t(0.05, 38df) = 1.960$

Table –3 depicts the distribution of aspect wise post- test mean skin integrity score in control and experimental group. Regarding parameter of skin integrity assessed by observation score was 49.7% with the standard deviation of 9.2 and regarding parameter of skin integrity assessed by palpation mean score was 47.8% with the standard deviation of 8.2. Where as in experimental group regarding parameter of skin integrity assessed by observation score was 37.3 with the standard deviation of 10.9 and regarding parameter of skin integrity assessed by palpation score was 35.8% with the standard deviation of 6.9.

TABLE – 4: Frequency and percentage on Scores of Skin Integrity level of Subjects.

Skin integrity Level	Category Score (%)	Classification of Subjects.						χ^2 value
		Control Group (n=20)		Experimental Group (n=20)		Combined (n = 40)		
		N	%	N	%	n	%	
Mild	Up to 50	8	40.0	17	85.0	25	62.5	8.64*
Moderate	51-75	12	60.0	3	15.0	15	37.5	
Severe	Above 75	0	0.0	0	0.0	0	0.0	
Total		20	100.0	20	100.0	40	100.0	

* Significant at 5 % Level, $\chi^2(0.05, 1df) = 3.841$

Table–4 depicts the skin integrity outcome parameters level in experimental and control group. Mild skin integrity outcome parameter level in experimental group is 85.0%, where as in control group it is 40.0%. Moderate skin integrity outcome parameter level in experimental group is 15.0%, where as in control group it is 60.0%. Sever skin integrity outcome parameter level in experimental group is 0.0%, where as in control group it is 0.0%. The χ^2 value is 8.64 at the 5% level of significance. Hence H_1 is accepted and H_{01} is rejected. The same data is represented in the form of graph in figure-2.

Figure – 2: Frequency and percentage on Scores of Skin Integrity level of Subjects.

TABLE – 5: Association between Demographic variables and level of Skin Integrity in Control Group**n=20**

Demographic Variables	Category	Sample (n)	Subjects				χ^2 value	p Value
			Mild		Moderate			
			N	%	N	%		
Age Group (years)	31-40	8	2	25.0	6	75.0	1.71 NS	> 0.05
	41-50	9	4	44.4	5	55.6		
	51-60	3	2	66.7	1	33.3		
Gender	Male	10	3	30.0	7	70.0	0.83 NS	> 0.05
	Female	10	5	50.0	5	50.0		
Religion	Hindu	9	3	33.3	6	66.7	1.67 NS	> 0.05
	Muslim	10	4	60.0	6	60.0		
	Christian	1	1	100.0	0	0.0		
Type of Family	Nuclear	9	4	44.4	5	55.6	0.14 NS	> 0.05
	Joint	11	4	36.4	7	63.6		
Educational status	Up to Primary	3	0	0.0	3	100.0	3.41 NS	> 0.05
	Middle/High school	13	7	53.8	6	46.2		
	PUC/Graduate	4	1	25.0	3	75.0		
Economic Status	Rs.2,001-3,000	5	1	20.0	4	80.0	2.90 NS	> 0.05
	Rs.3,001-4,000	8	5	62.5	3	37.5		
	Above Rs.4,000	7	2	28.6	5	71.4		
Residence	Urban	11	5	45.5	6	54.4	0.30 NS	> 0.05
	Rural	9	3	33.3	6	66.7		
Source of information	Mass media	4	1	25.0	3	75.0	1.40 NS	> 0.05
	Parents/Friends/Relatives	9	3	33.3	6	66.7		
	Health Personal/Professionals	7	4	57.1	3	42.9		
Total		20	8	40.0	12	60.0		

NS : Non-significant

TABLE – 6: Association between levels on Skin Integrity and Selected Demographic Variables of Subjects in Experimental Group**n=20**

Demographic Variables	Category	Sample (n)	Subjects				χ^2 value	p Value
			Mild		Moderate			
			N	%	N	%		
Age Group (years)	31-40	8	80.0	2	20.0	10	0.92 NS	> 0.05
	41-50	5	83.3	1	16.7	6		
	51-60	4	100.0	0	0.0	4		
Gender	Male	8	73.7	3	27.3	11	2.89 NS	> 0.05
	Female	9	100.0	0	0.0	9		
Religion	Hindu	12	100.0	0	0.0	12	5.36 NS	> 0.05
	Muslim	3	60.0	2	40.0	5		
	Christian	2	66.7	1	33.3	3		
Type of Family	Nuclear	3	75.0	1	25.0	4	0.39 NS	> 0.05
	Joint	14	87.5	2	12.5	16		
Educational status	Up to Primary	6	100.0	0	0.0	6	4.31 NS	> 0.05
	Middle/High school	5	100.0	0	0.0	5		

	PUC/Graduate	6	66.7	3	33.3	9		
Economic Status	Rs.2,001-3,000	3	100.0	0	0.0	3	4.31	> 0.05
	Rs.3,001-4,000	8	100.0	0	0.0	8	NS	
	Above Rs.4,000	6	66.7	3	33.3	9		
Residence	Urban	7	70.0	3	30.0	10	3.53	> 0.05
	Rural	10	100.0	0	0.0	10	NS	
Source of information	Mass media	4	80.0	1	20.0	5	0.45	> 0.05
	Parents/Friends/Relatives	2	100.0	0	0.0	2	NS	
	Health Personal/Professionals	11	84.6	2	15.4	13		
Total		17	85.0	3	15.0	20		

Table 5 and 6 represents the association between variables like age, sex, religion, marital status, types of family, education, occupation, family income, place of residence, , source of information related to health, reason for pitting oedema, under the treatment of diuretics and frequency of diuretics administrations with post-test skin integrity outcomes scores were found to be non-significant.

IV. CONCLUSION:-From the statistical analysis it was clear that there was significant reduction of skin integrity parameter level in experimental group as compared to control group of lower leg pitting oedema patients after implementation of scheduled nursing interventions. From this it could be concluded that scheduled nursing interventions was effective in bringing out these changes. A similar study may be conducted on limited sample size for wider generalization.

4.1 Implication to nursing practice:-Much lower leg pitting oedema patients are having a fear of skin breakdown. The lower leg pitting oedema patients can be helped by providing scheduled nursing interventions to recovery. This, in turn, will help to restore the health based on their need. The finding of the present study shows that skin integrity outcomes after lower leg pitting oedema can be improved by providing scheduled nursing interventions. So it is essential for the nurses to provide scheduled nursing interventions to lower leg pitting oedema patients.

4.2 Limitation

The study was limited to lower leg pitting oedema.

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Study to evaluate the effectiveness of planned teaching programme in terms of knowledge and practice regarding prevention and control of tuberculosis among Nurses of selected institute of pulmonary medicine and tuberculosis, Delhi

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Abstract:- A study to evaluate the effectiveness of planned teaching programme in terms of knowledge and practice regarding prevention and control of tuberculosis among Nurses of selected institute of pulmonary medicine and tuberculosis, Delhi was conducted with conceptual framework based on Dorothy Orem's Self Care model. The research approach was experimental with pre-test post-test control group design. The population comprised Nurses working in selected institute of pulmonary medicine and tuberculosis, Delhi. Independent variable was the planned teaching programme on prevention and control of tuberculosis and dependent variables were knowledge and practice regarding prevention and control of tuberculosis. The tools used were structured knowledge questionnaire to assess the knowledge and self-expressed practice rating scale to assess the practice regarding prevention and control of tuberculosis among Nurses. A pilot study conducted with 20 samples (10 experimental + 10 control) and final study with 60 samples (30 experimental + 30 control). A purposive sampling technique with random assignment was used and obtained data was analyzed using both descriptive and inferential statistics according to the objectives and hypothesis of the study. The mean post-test knowledge score was 25.33 which was higher than the mean pretest knowledge score of 12.1 as evident from 't' value, 20.01. The mean post-test self-expressed practice score was 112.97 which was higher than the mean pre-test self-expressed practice scores 82 as evident from 't' value of 42.2, both were significant at 0.05 level. There was a positive relationship between knowledge and practice. The teaching Programme was effective to enhance the knowledge and improving the practice among Nurses. In future, similar study can be conducted in the community settings, among other health care workers and a comparative study can be conducted among Nurses working in institute of pulmonary medicine and tuberculosis with Nurses working in general hospital.

Keywords: Effectiveness, Planned teaching programme, Expressed practice

1. INTRODUCTION:- Tuberculosis (TB) is an infectious disease caused by Mycobacterium tuberculosis that spreads from person to person through the air. TB usually affects the lungs, but it can also affect other parts of the body. TB is transmitted when a person with active pulmonary disease expels the organisms and the susceptible person inhales the droplets and becomes infected. Globally 10.4 million people fell ill from TB every year that is over 28,500 people every day. 1.8 million People died from TB including 400,000 with HIV + TB i.e. 4,900 people die every day. 60% of TB cases globally occurred in just 6 countries; these are China, India, Indonesia, Nigeria, Pakistan, and South Africa (**WHO Global TB Report, 2016**).

One-fourth of the global incident TB cases occur in India annually. Out of the estimated global annual incidence of 9.6 million TB cases, 2.2 million were estimated to have occurred in India. **(TB India annual status report. 2016).**

Mankind has known tuberculosis for ages. In Egyptian Mummies, TB of spine or Pott's disease can also be seen. It also existed even in Vedic age i.e. nearby 5000 years ago. Tuberculosis was mentioned in Rigveda as "Rajayakshma". It was also called "Kshya" as it caused progressive wasting of the body. **(Tuberculosis Association of India 2000)**

Basavaraj, A. et al. (2016) conducted a retrospective during 2011-2013 among HCWs in Pune, Maharashtra. Researchers found 26 (3.9%) cases of tuberculosis were reported among 662 medical trainees, representing an estimated incidence of 3,279 cases/100,000 persons. out of 26 cases of tuberculosis 3 were Ionized-resistant, 1 was multidrug-resistant, and 1 had developed hepatitis after starting treatment for TB.

In the era of XDR-TB which is practically incurable, it is critical to protect the health of our HCWs because they are the main weapons in the battle against TB, and their health needs to be protected as well. **(Rai, S.P. 2009)**

2. Problem Statement:-A study to evaluate the effectiveness of planned teaching programme in terms of knowledge and practice regarding prevention and control of tuberculosis among Nurses of selected institute of pulmonary medicine and tuberculosis, Delhi.

3. Objectives of the Study

1. To assess the knowledge and practice with regard to prevention and control of tuberculosis infection among Nurses.
2. To evaluate the effectiveness of planned teaching programme in terms of knowledge and practice with regard to prevention and control of tuberculosis.
3. To seek relationship between knowledge and practice among Nurses after administration of planned teaching programme.
4. To seek association between post-test knowledge of Nurses with selected variables:
 - a) Age, b) Sex, c) Education, d) Yrs. of experience, e) In-service education on prevention and control of Tuberculosis.
5. To seek association between post-test practice of staff nurses with selected variables:
 - a) Age, b) Sex, c) Education, d) Yrs. of experience, e) In-service education on prevention and control of Tuberculosis

4. Method and Material:

4.1 Research Approach and Design: Experimental and Pre-test Post-test control group Design

GROUP	PRE-TEST POST TEST CONTROL GROUP DESIGN		
	DAY1		DAY 8
	PRE-TEST	INTERVENTION	POST-TEST
Nurses working in Rajan Babu Institute of pulmonary medicine and tuberculosis, Delhi. N= 60	Pre-test to assess the: Knowledge and Practice. N=60 (30 control group+ 30 experimental group)	Administration of planned teaching programme on prevention and control of tuberculosis. N=30 (experimental group)	Post-test to evaluate the: Effectiveness of PTP in terms of knowledge and practice. N=60 (30 control group + 30 experimental group)

Figure 1: Schematic representation of research design

4.2 Research setting: Rajan Babu Institute of pulmonary medicine and tuberculosis, Delhi

4.3 Population: Nurses working in Institute of pulmonary medicine and tuberculosis, Delhi.

4.4 Sample and Sampling technique: Try Out: 10 Nurses, Pilot Study = 20 Nurses (experimental group 10 + control group10). Final Study = 60 Nurses (experimental group 30 + control group30).

Purposive sampling with random assignment to experimental and control group.

4.5 Inclusion criteria:- Nurses who are in the post of nursing officer and senior nursing officers, who are available during data collection, who are willing to participate, and both male and female Nurses.

4.6 Exclusion criteria: Nurses in the post of ANS, DNS, who are not willing to participate and who are selected for the pilot study.

4.7 Independent variable-Planned teaching programme on prevention and control of tuberculosis.

4.8 Dependent variables-knowledge and practice regarding prevention and control of tuberculosis.

4.9 Extraneous variables- age, professional qualification, working experience, and in-service education.

Table no.1 summary of data collection tools and techniques

S. No.	Tool	Purpose	Technique
1.	Tool: Knowledge questionnaire & practice rating scale. Part- A Structured questionnaire Part- B Structured knowledge questionnaire Part -C Self-expressed practice rating scale.	To collect the sample characteristics. To assess the Knowledge regarding prevention and control of tuberculosis. To assess the practice regarding prevention and control of tuberculosis infection.	Paper and pen Paper and pen Paper and pen

Table no. 2 Method and the result of the reliability of tools

S.No.	Tool	Method of computing reliability	Reliability coefficient
1.	Structured knowledge questionnaire	Kudar Richardson-20 formula	0.78
2.	Self-Expressed practice rating scale	Cronbach's Alpha	0.83

4.10 The following steps were taken to develop planned teaching programme:

- Development of content outline, preparation of the first draft, content validation of planned teaching programme established by 13 experts, preparation of the final draft, and then preparation of PPT, chart, and flashcards as teaching aids

5. Ethical Clearance:-Research proposal was presented by the researcher in front of the research committee and after the approval by the research committee; the ethical clearance letter was issued to the researcher. Nurses were explained about the purpose and nature of the study.

Confidentiality of their response was assured and signature on the consent form was taken from the participants.

6. Findings of Research

TABLE NO. 3: Frequency and percentage distribution of Demographic characteristics of Experimental and Control group.

N=60

Sample Characteristics	FREQUENCY					Total Percentage
	Experimental Group N=30		Control Group N=30		Total	
	F	%	F	%		
AGE (years)						
21-30	1	3.33	1	3.33	2	3.33%
31-40	13	43.33	15	50	28	46.67%
41-50	10	33.33	11	36.67	21	35%
Above 50	6	20	3	10	9	15%
GENDER						
Male	6	20	7	23.33	13	21.67%
Female	24	80	23	76.67	47	78.33%
PROFESSIONAL QUALIFICATION						
G.N.M	26	86.67	25	83.33	51	85%
BSc. Nsg.	4	13.33	5	16.67	9	15%
MSc. Nsg.	0	-	0	-	0	0%
DESIGNATION						
Staff Nurse	23	76.67	24	80	47	78.33%
Sister Incharge	7	23.33	6	20	13	21.67%
TOTAL WORK EXPERIENCE IN T.B. HOSPITAL						
Less than 1year	0	-	0	-	0	0%
1-10 years	8	26.67	9	30	17	28.33%
11-20 years	8	26.67	12	40	20	33.33%
21-30 years	11	36.67	8	26.67	19	31.67%
Above 30 years	3	10	1	3.33	4	6.67%

In-service education related to infection control						
Yes	11	36.67	9	30	20	33.33%
No	19	63.33	21	70	40	66.67%

H1- There will be a significant difference in mean pre-test and mean post-test knowledge score within experimental group as measured by structured knowledge questionnaire.

- The mean post-test knowledge score was 25.33 for experimental group which is higher than the mean pre-test knowledge score 12.1 of experimental group. The obtained mean difference (13.23) between post test and pre test knowledge scores of experimental group was statistically significant as evident from “t” value 20.01 for df-29 at 0.05 levels. Therefore the obtained mean difference was true difference and not by chance. **Hence research hypothesis (H1) is accepted.**

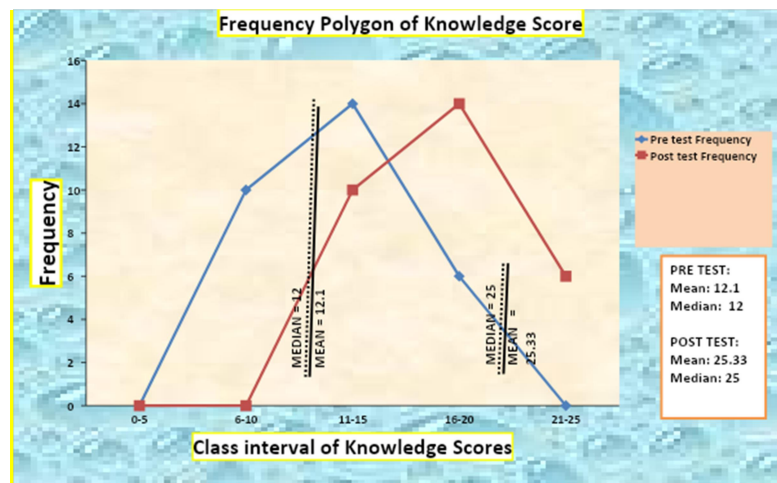


Figure No. 2: Frequency polygon showing pre and post-test knowledge score of Experimental group.

H2- There will be a significant difference in the mean post-test knowledge scores between experimental and control group.

- The obtained mean difference (11.6) between post-test knowledge score of experimental group and post-test knowledge scores of control group was statistically significant as evident from “t” value 45.31 for df-58 at 0.05 levels. **Hence research hypothesis (H2) is accepted and the null hypothesis (HO2) is rejected.** This shows that the Planned Teaching programme is effective in enhancing the knowledge of Nurses.

H3- There will be a significant difference in mean pre-test and mean post-test practice score within experimental group.

- The mean post-test practice scores (112.97) of experimental group assessed through self-expressed practice rating scale is higher than their mean pre-test practice score (82). The obtained mean difference (30.97), was statistically significant as evident from “t” value 42.25 for df (29) at 0.05 level. **Hence research hypothesis (H3) is accepted.** This shows that the Planned Teaching programme is effective in improving the practice among Nurses.

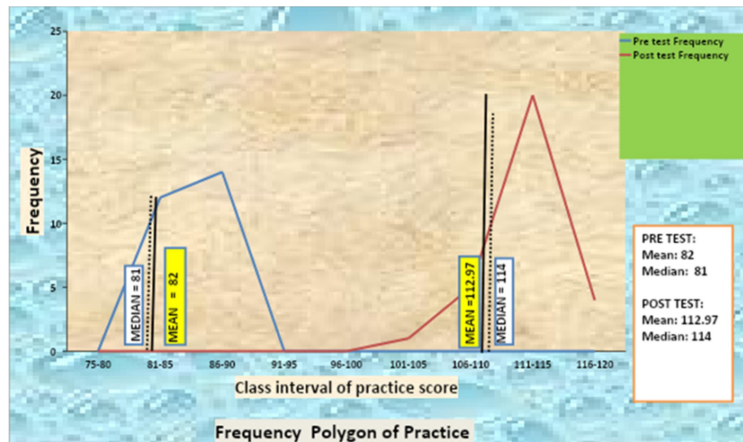


Figure No. 3: Frequency polygon showing pre and post-test practice score of experimental group.

H4- There will be a significant difference in the mean post-test practice scores between experimental and control group.

- The mean post-test practice score was 112.97 for experimental group which is higher than the mean post-test score of 82.367 in control group. The obtained mean difference (30.603) was statistically significant as evident from "t" value 45.2 for df-58 at 0.05 level of significance. This shows that the Planned Teaching programme on prevention and control of tuberculosis is effective in improving the practice among Nurses. Therefore **research hypothesis H4 was accepted.**

H5- There will be a significant relationship between post-test knowledge score and post-test practice score of Nurses regarding prevention and control of tuberculosis.

- Correlation of coefficient is computed to find the relationship and found a positive correlation ($r = 0.78$) between post-test knowledge score and post-test practice score of Nurses in experimental group which is statistically significant at 0.05 level. Therefore **research hypothesis H5 was accepted.** The positive correlation shows that as the knowledge scores increase, it enhances the practice.

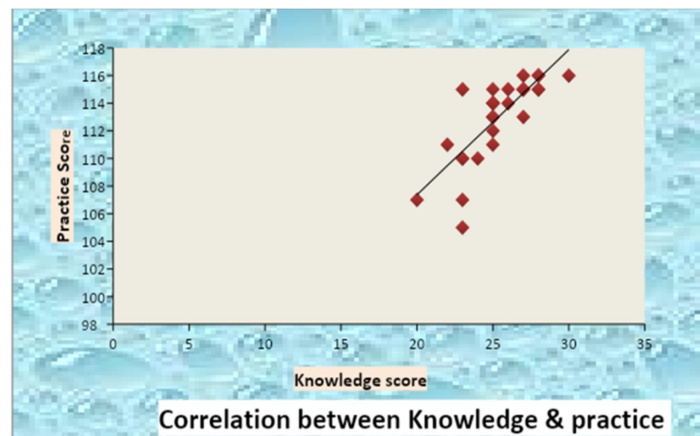


Figure 4: Scatter diagram showing correlation between post-test knowledge and post-test practice score of experimental group

H6:- There will be a significant association between post-test knowledge score of Nurses and selected demographic variables such as age, sex, education qualification, years of experience, and in-service education.

- The computed chi-square value at the 0.05 level of significance showed no association between post-test knowledge scores and selected variables. **Hence the researcher failed to reject the null hypothesis (H06).**

H7:- There will be a significant association between post-test practice score of Nurses and selected demographic variables.

- The computed chi-square value at the 0.05 level of significance showed no association between post-test practice scores and selected variables, such as age, sex, professional qualification, years of experience, and in-service education. **Hence the researcher failed to reject the null hypothesis (H07).**

7. Summary:-Tuberculosis is a global health problem and to fight against it, we need health care professionals. During the era of MDR and XDR TB and overcrowded hospitals, it becomes utmost important to prevent and control TB among Nurses, so the need for the study was felt by the investigator. The present study deal with the change in knowledge and practice of Nurses working in Institute of pulmonary medicine and tuberculosis, Delhi, through planned teaching Programme on prevention and control of Tuberculosis.

8. Discussion of Findings

8.1 Deficit knowledge and practice regarding tuberculosis: - The mean pretest score was 12.1 out of 30 and mean pretest practice score is 82 out of 120. These findings are consistent with findings of the study conducted by **Leyal, D. (2013)** to assess the knowledge about anti TB treatment among Nurses working at TB and lung health care setting. It concluded Nurses had deficiency in knowledge related to effects and side effects of anti-TB drugs.

8.2 Effectiveness of teaching Programme:- The mean difference of pretest and post-test knowledge score and mean difference of pre-test post-test self-expressed practice score of experimental group found statistically significant at 0.05 level of significance. These findings are consistent with the study conducted by **Patidar, L.R., Ravindra, H.N., Jain, K.P. (2014)**, to assess the effectiveness of teaching plan on knowledge regarding prevention and control of tuberculosis among GNM students in selected Nursing school. The result indicate increase in post-test knowledge score, which shows teaching programme is an effective tool to improve the knowledge of GNM students.

8.3 Correlation between knowledge and practice:- The finding of the study is consistent with the study conducted by **Temesgen, C., and Demissie, M., (2014)**, to assess the knowledge and practice among health professional in North West Ethiopia. The researcher concluded that the respondents with good knowledge regarding tuberculosis infection control were 10 times more good TB infection control practice as compared to poor knowledge.

9. Conclusion:-There was significant gain in knowledge and practice scores after administration of planned teaching programme, positive correlation between knowledge and self-expressed practice score, and no significant association between post-test knowledge as well as practice score with selected variables.

10. Implications:-In Nursing Practice, the findings of the study will encourage the good practice of prevention and control of tuberculosis among Nurses. In nursing research findings of research

serves as a basis for professionals and students to conduct further studies to generalize the findings.

11. Limitation of the study:-The present study is confined to only Nurses working in the Institute of pulmonary medicine and tuberculosis Delhi.

12. Recommendations:-A similar study can be conducted on a large sample so that findings can be generalized. Similar studies can be conducted in community settings and on various health care workers. A comparative study can be conducted among general hospital and TB hospital.

13. Acknowledgment:-The author would like to express heartfelt thanks with deep sense of gratitude and respect to Mrs. Santosh Mehta, former Principal RAK College of Nursing.

14. Conflicts of interest: There is no conflicts of interest.

15. Financial support and sponsorship: Nil.

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Development of recruitment tools for biotechnology led organizations: A customer centric view towards product development

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Abstract:-While biotechnology offers a wide variety of career choices recruitment of skilled scientific personnel is a major challenge for biotechnology led industries. In order to develop solutions to address these problems, it is important to understand the problems from the perspective of the people who are involved in making hiring decision. This approach can be referred to as “customer centric view towards talent acquisition.” This paper analyses the problems faced by various group(s) of stakeholders and provides recommendations to developing recruitment tools to address the problems.

Key Words:-Scientific recruitment, biotechnology talent acquisition, recruitment challenges in biotechnology industry.

Introduction:-The first step in any application development is a clear articulation of the problem the application is trying to solve and the value it will bring to its intended customers (Jiao & Chen, 2016; Welo, 2011). Developing recruitment tools to address the inefficiencies in recruitment of scientific man power in biotechnology led industries is no different to this fundamental rule. Over the last two decades biotechnology industry emerged as a key driver of global economy, opening a host of career choices in technical and scientific domain (Freedman, 2020). However, the progress in developing biotechnology industry focused recruitment tools is relatively slow. Recruiting and retaining scientific talent is key driver of success of biotechnology firms (Béraud et al., 2020; Casper & Murray, 2005; Chen et al., 2016; Darmody & Bendis, 2021; O’Neill, 2007) and there seems to an urgent need to address this need through digital technologies. In view of these facts, this research paper presents a conceptual framework to understand the needs of customers who are likely to use IT enabled tools to recruit scientific personnel. The findings described in the paper can be used to develop recruitment tools.

The customer and user view:-Before dwelling deeper into the conceptual framework described in later sections, it is important to understand the key difference between “customers” and “users”. A customer is defined as an individual or entity which is responsible for making buying decisions. A user is defined as an individual or entity who is direct or indirect user of consumer of the end product. In pursuant of the above definitions, this paper focuses on customer analysis, providing insights about the potential individuals and entities that can buy or subscribe recruitment tools designed specifically for biotechnology industry.

Customer Segmentation:-A careful analysis of the landscape of biotechnology industry both in India and globally potential customer segment for the prototype search engine are identified.

- Big and established companies
- Small and mid sized companies
- Start-ups
- Recruitment agencies
- Academic institutions and research institutes
- Foreign trade organizations specific to biotechnology sector
- Industry associations specific to biotechnology industry

The reminder of the paper presents an analysis of characteristics of each of customer groups. The analysis considers the problems these customers groups are facing and what are the solutions they are looking for. Finally, recommendations for development of recruitment tools are discussed. The below analysis shows why the prototype search engine is relevant to these customer groups. The details of the identified customer groups are described below.

Large & Established Companies

The segment is always under the pressure to recruit candidates within specified timelines and spend good money in subscribing to almost all the channels available in market for recruitment. This segment heavily relies on the resume databases and search candidate profiles to find a suitable match to the open job positions. Another option these companies use is seeking services of recruitment agencies. This segment focuses on rapid turnaround time to search right profiles. Another solution these companies need is to filter relevant CVs received against a job posting. Since screening of candidate profiles is perceived as an administrative task and requires considerable time of resources, large and established companies prefer to outsource the task of screening candidate profiles to third party vendors like recruitment agencies. Another reason that can explain this pattern is non availability of automated system for screening and matchmaking of jobs to job seeker profiles.

Small and Mid-Sized Companies:- This user group always almost have a problem of resource constraint. As the name suggests, being small in nature, the Human Resource function of these companies is most likely to have less staff. The HR staff is mostly involved in taking care of compliance and administrative work. For hiring resources small and mid-sized companies seek help from recruitment agencies. This user segment also relies on frequent use of job portals to post open jobs and inviting applications from qualified candidates. Many small and mid-sized companies work in a niche segment and hence need scientific personnel with specific skills. The key problem faced by the segment is reaching out to right talent in the defined time constraint. Attracting and retaining the talent is another problem face by this user group. This user group need recruitment partner who can search right talent to hire scientific personnel with right skills. Considering this scenario, the recruitment partners who serve the needs of this segment need a solution to hire right talent in the most cost-effective way. Similarly providing the similar solution to the small and mid-sized companies can help them become more self-reliant and have less dependency on external recruitment agencies.

Start-ups:- To make a point in right context, case of Indian start-up ecosystem is presented here. In India there are two types of start-ups are seen in biotechnology start-up ecosystem. The first category is those companies which are funded by government agencies like BIRAC (Biotechnology Industry Research Assistance Council). The second category is those companies which are funded by private players like venture capitalists or angel investors. Each of these users has a unique behavioral pattern. The first category companies are not cash rich entities and are very frugal in terms of spending money. This pattern is obvious as the monetary resources these companies have are very limited. Another key attribute of these companies is that they work on proof-of-concept stage. At this stage the requirement of scientific personnel is also less. In many cases the work these companies do is very niche and the requirement of scientific personnel is also niche area. These companies seem to be less inclined towards buying recruitment services and prefer hiring through networking. Their innate focus on scientific development contributes to the reluctance to use recruitment solutions. Moreover, if the recruitment solutions available in the market are costly or are coated with several bureaucratic layers, this user group is most likely to stay away for such solutions. The second group of start-

ups mentioned earlier, shows similar behavioral pattern. This segment may have relatively better access to monetary resources as compared to the first one. This user group has good follower base and a large proportion of scientific fraternity shows excitement in joining these start-ups. These user groups need scientific personnel with niche skills. Another problem faced by these companies is challenges in reaching out to right talent base. Because of these two key attributes, this use segment needs help of recruitment partners who can search partners with right skills. Considering these unique needs of this user segment, the solution required of this user segment is to have a mechanism that enables them find talent with niche talent. Cost effectiveness of the solution always remains an obvious need. The current recruitment tools available in the market seem to perform very poorly in addressing this need. The prototype search engine does provide capabilities to screen profiles of candidates in niche areas and in cost effective way. Moreover, the workflows of the prototype search engine are very simple and any one can use it for job-seeker matchmaking purpose.

Recruitment Agencies:-Recruitment agencies are key players in helping biotechnology companies recruit the people they are looking for. Companies seek their services to transfer the risk and work of searching are screening of relevant profiles. Recruitment agencies pay huge attention to increasing their data base; however perform poorly on segregate the profiles. Recruitment agencies rely heavily on job portals for job posting and resume database services. Off late this segment is using social media especially LinkedIn extensively for searching candidate profiles. The key problem faced by this user segment is heavy pressure to close the open position on behalf of their clients in quick time. Recruitment agency business is high risk and low return because of the nature of its business model. Recruitment agencies get paid only after successful placement of a candidate. This means recruitment agencies get paid by their clients only if the candidate they have referred to their client accepts the job offer and joins the organization. For recruitment agencies it is therefore becomes important to identify a job seeking scientific personnel with right skills from a pool of candidate profiles and then make a successful closure. A careful look at the recruitment agencies profiles draws certain key pointers. Most of the recruitment agencies provide recruitment services in several industry sectors such as Power, Telecom, Information Technology etc. Biotechnology industry remains as just one more industry sector as part of their service portfolio. This does not necessarily translate into a commitment of the recruitment agency to serve the biotechnology sector. Moreover, it is very important that the recruitment agency has domain expertise in biotechnology sector to enjoy higher closure rate that eventually translates into profitable business proposition. For the recruitment agency user group, it is therefore very important to remain competitive advantage in the industry sector they are catering to. While there are several aspects that contributes to achieving and retaining the competitive advantage, one capability that certainly needs groomed by the recruitment agencies is to search and screen relevant candidate profiles that can be employed by their client.

Academic and Research Institutes

Traditionally academic institution and research institutions are using print media for advertising academic and research jobs. This can be explained by the local regulatory requirement that makes it compulsory for this user group to use print media. However academic and research institutions are showing an increasing trend of using online recruitment platforms to advertise jobs. Academic and research institutions especially of national importance use online recruitment platforms are on constant lookout for good faculty and scientists. For instance, in India, IITs, NITs, IIITs and IISc fall in this category. A review of market leading online job platform will show several job postings from these institutions. A trend that has been observed in recent years

is providing opportunities to returning Indians in these institutions as academic faculty or research scientist. For instance, the Ramalingam Fellowship offered by government of India is specifically meant for such returning Indians. Academic institutions also look for professional from industries who wish to make a career in teaching. This requirement is one of the key problem areas for these institutions as they find it difficult to reach out to right candidate in first place. For this user group, a mechanism that enables them to reach to right scientific professional who are willing to take up academic and research position becomes an important need.

Global Trade Organizations Specific to Biotechnology Sector

Almost every country has a trade and relationship office specific to biotechnology sector. These organizations provide services in improving bilateral trade between two countries. One of the key characteristics these organizations demonstrate is heavy focus on networking that central to improving trade relationships. These organizations need people with techno commercial expertise. This means the target employee bases of these organizations are those people who have technical/scientific expertise as well as well-grounded skills in business management. These organizations face challenges in recruiting right candidates because of limited understanding of the local market they are operating in and rely on seeking help from external recruitment agencies. In this case as well having a mechanism to search, select and hire candidates' remains a key need

Conclusions

The customer analysis presented above leads to two important conclusions

1. There is sizeable user group with diverse needs
2. Problem statement of all the user group boils down to following statement – ***“non availability of effective mechanism to search and perform matchmaking of job-jobseeker in effective and accurate manner”***

This problem statement offers an unique opportunity to develop solutions specifically for biotechnology led organizations to recruit scientific personnel in timely and cost effective manner. \

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An overview of the new research areas to understand and improve recruitment process effectiveness of biotechnology led organizations

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Abstract:-Hiring scientific personnel in a timely manner is a key challenge faced by biotechnology led organizations. This paper provides insights on need of empirical studies to address the problem areas in the recruitment process and provides an analysis of new promising research areas.

Key words: - recruitment in biotechnology industry, scientific recruitment

Introduction:-There is an ample evidence of research studies providing insights on inefficiencies in the recruitment process of industries like automobile, telecom and healthcare(Moses & Sharma, 2020; Pillai & Sivathanu, 2020; Srivastava & Bhatnagar, 2008; Thatcher et al., 2012). However, there are practically no conclusive research studies in this area with specific reference to biotechnology industry. This research paper attempts to highlights some of the important research areas which can be considered to formulate empirical research studies to understand the current state of recruitment practices followed by biotechnology led organizations. Systematic studies if conducted in these areas can greatly contribute to our understanding of current challenges faced by biotechnology industry in recruitment scientific personnel and make further progress in developing appropriate solution approaches.

Importances of recruitment function of biotechnology lead enterprises as a key enabler of achieving organization goals.

Strategic Human Resource Management (SHRM) is gaining significance in today's business context (Arvanitis et al., 2016).The widely used term, "human resource management" is now being referred to as "human capital management" or "human asset management."This change in the outlook of the terminologies signifies the importance of people who work in an organization. The people or employees working in an organization are viewed as a competitive advantage(Schroeder, 2012). Having right employees is particularly important for an organization to meet its strategic objectives, as it is fairly easy to understand that the people working in an organization translates the goals into reality. In view of these aspects, more empirical studies are required to understand the workflows and overall process followed by human resource function in areas like recruitment and talent management. More precisely research studies can be formulated to assess the effectiveness of recruitment function in "hiring scientific personnel with right skills such that they can perform the assigned work in an effective manner."Another research area could be challenges faced by recruitment function in light of constant change an organization are witnessing. These changes are driven by new technology adoption, change in business process, adoption of new business model, expansion of product or service portfolio or mergers and acquisitions. Owing to these factors organizations are constantly in search of employees who are qualified in their respective practice areas and possess behavioral attributes like adaptability, collaboration and self-organization. This means that human resource function needs to have capabilities to respond to the needs of organization that requires agile, change ready and technical skilled staff on a continual basis. Failure of human resource function

in delivering on this key capability can severely dent the organization's prospects in pursuit of its vision and goals. A systematic treatment to these research areas is required in today's business context. Lastly it is important to note that a bad hiring decision can cost organization in long run. Hence a proactive approach in ensuring flawless talent acquisition is critical. Having newer insights through well formulated research studies in the areas of incurred losses by biotechnology led organizations can add to our understandings.

Developing capabilities to improve recruitment process effectiveness for biotechnology industry.

In the earlier section various research areas pertinent to importance of strategic recruitment are discussed. This section discusses research areas that can lead to improve recruitment aspects are considered. To make a point, data from certain studies and reports is presented below. As per the report of India Brand Equity Foundation (IBEF), the Indian biotechnology industry is projected to grow at a CAGR of 16.4% with an estimated revenue of USD 150 billion by year 2025 (IBEF, 2021). The report published by Bio.org in collaboration with Economy indicates that the US biotechnology companies employed 1.74 million people and seen a steady increase in the employment statistics from 2001 to 2016. This statistic is another indication of growing employment rate in biotechnology industry. In an another study conducted by North-eastern industry the author makes a compelling point that the need of trained biotechnology scientists will continue to rise in future (Jouber, 2018).. Another survey conducted by Aus Bio in collaboration with Grant Thornton provided insights on the positive outlook of employment trends in the Australian Biotechnology Industry (Aus Biotech, 2019).

These studies lead to an important point that as the biotechnology industry is experiencing growth and hence an increase in number of new jobs. This also means the industry will continue to face the challenges of recruiting scientific staff wiring tight timelines. While there is not much of academic literature available on this aspect, an article published in Nature Biotechnology does emphasise the importance of e-recruitment in biotechnology industry (McGrath, 2002). It would be interesting to know the perception of hiring managers from biotechnology industry about the fitment and usefulness of current recruitment tools in hiring scientific personnel. Research studies can also be formulated to understand the key expectations of these hiring managers about the possible solutions that can address their problem areas.

Enabling strategic recruitment as service delivery competency.

While talent acquisition can be viewed as organizational capability to achieve strategic goals, it can also be viewed as a service delivery competency. Considering human resource function as a "service provider" and the entity that need a new resource (a strategic business unit of the organization, or a department or a specialized team in the organization) as "service consumer" a bilateral relationship exists. In view of this it would be important to know the perceived value of strategic recruitment function by its consumers. A very little is known about this area. Another research area would be to identify key contributions the consumer side of the business can make in making service delivery function more effective. This view emphasizes the concept of "co-creation of value." In context of recruitment of scientific personnel, the value is expected to be co-created through a collaborative relationship between the service provider and the service consumer.

Application of digital transformation interventions to add more capabilities to recruitment process.

IT enabled recruitment or online recruitment is not new to biotechnology industry. Several recruitment tools provide search capabilities to search candidate profile. A key question to ask

here us whether these recommender systems are a good for the biotechnology industry or not. Another research area that holds significance is to look at an integrated solution that connects all step of recruiter process. While the use of application tracking systems (ATS) is not new, their adoption by biotechnology led industries can be a good area of research. It would be worth analysing the factors that encourages or discourages the adoption of this tool by biotechnology industry. Finally, application of data analytics and application of artificial intelligence and machine learning methods by biotechnology led organizations is an equally important research area.

Conclusion:-There is not enough supporting research literature available in the area of recruitment practices followed by biotechnology led industries. More empirical studies are required to understand the problems in these areas which can help in developing solutions to address these problems.

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Structural and Morphological Study of Polyaniline Thin Films

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Abstract:-Among all the conducting polymers, Polyaniline (PANI) holds a special position due to its unique properties such as cost-effectiveness of monomers, distinct electrical properties, outstanding redox reversibility, high ecological stability and can be easily polymerised in labs either by chemical or electrochemical methods. Thin films of PANI are prepared by polymerization of aniline. Structure and morphology of prepared thin films are analyzed by analytical techniques such as X-ray diffraction (XRD) & scanning electron microscopy (SEM).

Keywords: - Polyaniline, X-Ray diffraction, Scanning electron microscopy, nanoparticle

Introduction:-Polymer systems provide the chance to synthesize a wide variety of innovative materials, with incomparable properties. It has increased technical interest in a broad range of magnetic, optical and electrical properties [1][2]. It's technological use depends upon the reproducible balance on molecular and supramolecular architecture by a simple method of organic synthesis [3]. Among all the conducting polymers, synthesis of PANI does not require any accoutrements or precautions. Polyaniline is an intrinsically conducting polymer and also an organic semiconductor with enough length as compared to other polymers. The chains of conducting PANI have well defined ordered structure. They contain regular alternate phenyl rings including nitrogen-containing groups. There exist three oxidation states of PANI which are as follows: leucoemeraldine, emeraldine, and pernigraniline. They differ in chemical and physical properties.[3]–[5].It's outstanding properties such as simple and reversible doping-dedoping, stable electrical conduction, high ecological stability and easily synthesized has received a great attention of researchers towards itself[6], [7].It is highly potential in large no. In charge of storing batteries, electronic devices, LEDs, sensors, gas separation membranes etc.[1], [5], [8].

In present study, thin films of PANI are synthesized by oxidative polymerization of aniline on glass substrates and studied its structural and morphological properties

Experimental Materials and methods

Analytical grade chemical materials such as aniline, FeCl₃ and H₂SO₄were obtained from

Merks and used as received without further purification.

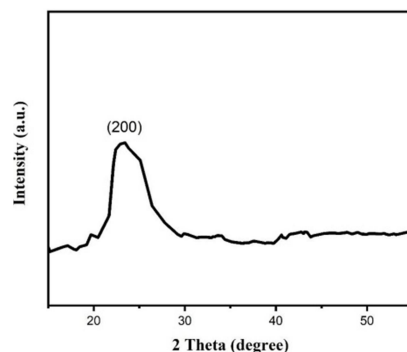
Synthesis

Polyaniline has been synthesized by chemical oxidative polymerization method. For synthesis PANI, were quire 0.2 M aniline 1.0M H₂SO₄ in deionizer water. Next step is to add, 0.2 M FeCl₃ in a drop wise manner by constant stirring the solution. The colour starts changing to dark green then keep the prepared solution overnight. The solution has to be filtered and the residue shall be washed away with deionized water. The filtered residue is then dried at 50⁰ C. PANI is deposited by a spin coating method on a glass substrate at 1500 rpm for 50 sec. Then the prepared film was kept for a half hour to dry completely at room temperature.

Characterization

Structural study of the polyaniline powder was done by using XRD. The patterns were recorded on a Rigaku D/MAX-2500 diffract meter Cu K_α radiation having a wavelength of 1.5418Å. The diffraction angle (2θ) was detected and scanned from 20–80 degrees. The surface morphologies of the PANI thin films were observed by SEM (JEOL, JSM-6360).

Result and Discussion



X-ray diffraction

The broad peaks reflected in XRD spectra of pure PANI ~ 23⁰ are the characteristic semi-crystalline peaks of emeraldine salt form of PANI is obtained due to short range π conjugation in the PANI matrix[2], [9]. The average crystallite size of PANI thin films were calculated as 15.60 nm from Debye Scherer formula [10], [11]. The average dislocation densities were 8.62×10^{-4} lines. nm⁻².

Scanning Electron Microscopy

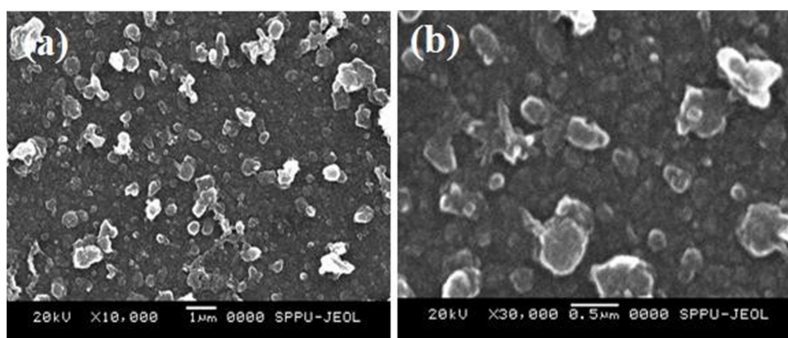


Fig.2 a) Low and b) High magnification SEM images of PANI thin films

Nanoparticles of PANI thin films, surface morphology studied using SEM were shown in Fig. 2. The SEM pattern of pure PANI thin films demonstrated agglomerated morphology. Collection of small spherical structures is due to increased inter-chain interactions.

Conclusions:- Polyaniline thin films were prepared by in situ polymerization on glass substrate. Structural and morphological properties studied by SEM and XRD. The average crystallite size and dislocation density of PANI thin films were calculated 15.60 nm and 8.62×10^{-4} line nm^{-2} respectively. As prepared PANI thin film demonstrated agglomerated morphology. As prepared PANI thin films will be used in gas sensor, energy storage devices.

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