Dissertation Training

KAREXPERT TECHNOLOGIES PRIVATE LIMITED

(May 16th to August 31st, 2022)

A Report on

"To assess the perception of Healthcare Professionals regarding technology adoption of Electronic Healthcare Record Systems in Hyderabad, Telangana"

By
Ms. Subhashree Nayak

Enroll No.- PG/20/086

Under the guidance of

Dr. Preetha G.S

Post -graduate Diploma in Hospital and Health Management2020-2022

International Institute of Health Management Research
New Delhi

+91-90691 13330/0124-4084453
www.kareXpert.com
contactus@karexpert.com

Completion of Dissertation from KareXpert

The certificate is awarded to

Ms. Subhashree Nayak

in recognition of having successfully completed his/her

Internship in the department of

Product Service Delivery

and has successfully completed her Project on

"To assess the perception of Healthcare Professionals regarding technology adoption of Electronic Healthcare Record Systems in Hyderabad, Telangana"

Date: 16th May to 31st Aug 2022

At

KareXpert Technologies Pvt. Ltd.

She comes across as a committed, sincere & diligent person

whohas a strong drive & zeal for learning.

We wish her all the best for future endeavors.

Training & Development **Human Resources**

TO WHOMSOEVER IT MAY CONCERN

This is to certify that Ms. Subhashree Nayak of PGDM (Hospital and Health Management) from International Institute of Health Management Research, New Delhi has undergone internship training at Karexpert technologes Private Limited, Gurgaon from 16th May 2022 to 31st August 2022.

The Candidate has successfully carried out the study designated to him during internship training and her approach to the study has been sincere, scientific, and analytical.

The Internship is in fulfillment of the course requirements.

I wish him all success in all her future endeavors.

Dr. Sumesh Kumar
Associate Dean, Academic and Student Affairs
IIHMR, New Delhi

Dr. Preetha G.S
Mentor
IIHMR, New Delhi

Certificate of Approval

The following dissertation titled **"Perception of Healthcare Professionals regarding adoption of technology in Electronic Health Record System in Hyderabad, Telangana"** at **"KareXpert Technologies Pvt. Ltd.,Gurugram, Haryana"** is hereby approved as a certified study in management carried out and presented in a manner satisfactory to warrant its acceptance as a prerequisite for the award of **PGDM (Hospital & Health Management)** for which it has been submitted. It is understood that by this approval the undersigned does not necessarily endorse or approve any statement made, opinion expressed, ed or conclusion is drawn therein approves the dissertation only for the purpose it is submitted.

Dissertation Examination Committee for evaluation of the dissertation.

Name	Signature
Dr. Anuj K. Pandey	
Dr. Ankur Kathuria	
Dr. Sukesh Bhardwaj	

Certificate from Dissertation Advisory Committee

This is to certify that **Ms. Subhashree Nayak,** a graduate student of the **PGDM (Hospital & Health Management)** has worked under our guidance and supervision. She is submitting this dissertation titled "To assess the perception of Healthcare Professionals regarding technology adoption of Electronic Healthcare Record Systems in Hyderabad, Telangana" at "KAREXPERT TECHNOLOGIES PRIVATE LIMITED" in partial fulfilment of the requirements for the award of the **PGDM (Hospital & Health Management).**

This dissertation has the requisite standard and to the best of our knowledge, no part of it has been reproduced from any other dissertation, monograph, report or book.

Institute Mentor Name- Dr. Preetha G.S

Designation- Associate Professor

Organization- IIHMR, Delhi

Organization Mentor Name – Mr. Manohar

Designation- Team Lead

Organization- Karexpert Technologies Pvt. Ltd.

INTERNATIONAL INSTITUTE OF HEALTH MANAGEMENT AND RESEARCH, NEW DELHI

CERTIFICATE BY SCHOLAR

This is to certify that the dissertation titled **"**To assess the perception of Healthcare Professionals regarding technology adoption of Electronic Healthcare Record Systems in Hyderabad, Telangana**"** and submitted by Ms. Subhashree Nayak, Enrollment No. **PG/20/086** under the supervision of **Dr. Preetha G.S** for the award of PGDM (Hospital & Health Management) of the Institute carried out during the period from **16th May to 31st August 2022.** Embodies my original work and has not formed the basis for the award of any degree, diploma associate ship, fellowship, titles in this or any other Institute or other similar institution of higher learning.

Signature

IIHMR DELHI

INTERNATIONAL INSTITUTE OF HEALTH MANAGEMENT RESEARCH (IIHMR)
Plot No. 3, Sector 18A, Phase- II, Dwarka, New Delhi- 110075
Ph. +91-11-30418900, www.iihmrdelhi.org

CERTIFICATE ON PLAGIARISM CHECK

Name of Student (in block letter)	Dr./Mr./Ms.: Subhashree Nayak		
Enrollment/Roll No.	PG/20/ 086	Batch Year	2020-2022
Course Specialization (Choose one)	Hospital Management	Health Management	Healthcare IT
Name of Guide/Supervisor	Dr./ Prof.: Preetha G.S		
Title of the Dissertation/Summer Assignment	Perception of healthcare professionals regarding technology adoption of electronic healthcare record systems.		
Plagiarism detect software used	"TURNITIN"		
Similar contents acceptable (%)	Up to 15 Percent as per policy		
Total words and % of similar contents Identified	6%		
Date of validation (DD/MM/YYYY)			

Guide/Supervisor

Name:

Signature:

Student

Name: Subhashree Nayak

Signature:

Report checked by

Institute Librarian

Signature:
Date:
Library Seal

Dean (Academics and Student Affairs)

Signature:
Date:
(Seal)

ABSTRACT

During this pandemic, healthcare sector has been the most evolved among all the fields. Integration of technology in healthcare field has been the solicitous subject to discuss among researchers during this period. Electronic healthcare record system aims to provide better facility, better care and more accessibility to the patient data. . Electronic healthcare record system not only classifies people according to their disease, but also improve treatment protocol. India being a traditional country, the evolution from manual paper based to electronic based system might take time, but it always has implicated better patient compliances and acceptance. This technology evolution in healthcare system aim at utilization of healthcare data for the purpose of providing quality healthcare & bettering the system.

Purpose: This study aims to understand the point of view of healthcare professionals regarding technology adoption in terms of EHR in healthcare system, and it focused to identify the lacuna. In addition to that, this study is trying to assess ,what will happen if healthcare professionals use technology judiciously in their system.

Methods: It is a cross sectional descriptive study, led through a questionnaire-based survey in Hyderabad, Telangana region. Here, the data has been collected from all cadres of healthcare professional, working in Hyderabad region.

Result- Based on the collected sample, it has been seen that, major portions of the professionals in the healthcare sector want an advanced system that not only store patient data but also minimizes cost and time adding to the quality of the medical facilities. In addition to them, it has been found that there are some barriers which is contributing to the difficulties of technology adoption, so there is a dire need for structural implementation of technology rather than forcible implementation, as well as training for all healthcare workers or employees.

Conclusion- We need a standardized central electronic healthcare record system. Even though we are having existing form of electronic health record system in private healthcare sector, the government should take steps towards better implementation in public sector as well.

Key Words- Electronic health record, Electronic medical record, Technology, Healthcare, Health worker, Healthcare Professionals.

ACKNOWLEGEMENT

It is my regarded delight to introduce this dissertation project by saying thanks to every single one, who helped me in this errand.

It has been an overwhelming experience for me working with this association. It would not have been that much fascinating and magnificent without a many individuals. For this great experience, I might want to thank a many individuals for supporting me all through this cycle.

Right off the bat, I might want to offer my earnest thanks towards Ms.Amrita Agarwal, AVP, Product Delivery, who offered me this chance to work with this organization.

I offer my genuine thanks to Mr.Manohar Kumar, Team Lead for empowering me to chip away at this venture and propelled me with their significant direction and contribution. I might want to communicate my gratitude to all the healthcare professionals, working in Hyderabad region, who helped me with excursion to finish my project on schedule.

I'm happy to recognize my mentor Dr.Preetha G.S, Associate teacher, IIHMR, Delhi for her thoughtful help and consistent help all through the preparation.

In conclusion, I wish my true love and appreciation to my folks, relatives and companions for boosting my certainty and giving confidence and strength all through the investigation cycle.

Subhashree Nayak

PG/20/086

TABLE OF CONTENT

CONTENTS	PAGE
ABSTRACT	08
ACKNOWLEDGEMENT	09
CHAPTER 1: ORGANIZATION PROFILE	11-13
CHAPTER 2: PROCESS FLOW OF IMPLEMENTATION AT KAREXPERT TECHNOLOGY	14-16
CHAPTER 3: PROJECT REPORT	
INTRODUCTION	17-19
LITERATURE REVIEW	20-22
METHODOLOGY	23
RESULT	24-29
LIMITATIONS	30
DISCUSSION	31-32
CONCLUSION	33
REFERENCE	34

Chapter 1: Organization Profile- Karexpert Technologies Pvt.Ltd.

Organization Profile

KareXpert, a Jio Platform funded venture, based in Gurugram, Haryana, has built an AI-led, Cloud-based Digital Healthcare Platform. This platform brings all the healthcare modules together as a pre-integrated stack at a fraction of cost. This includes Advanced HIMS, EMR/EHR, LIMS, RIS/PACS, Pharmacy, Telemedicine, Medical IoT, Advanced BI, Connected Ambulance, and many more.

Vision-

Aim to make access to quality healthcare a reality for everyone, we are on our path to digitally transform hospitals

Mission-

Building HealthCare Cloud to enable "Easy Access & Quality Care for ALL"

KareXpert Journey

2016- Xcloud Development Seed Funding

2+ years of development Digital Platform & Healthcare BRDs

2018- Symphony Healthcare Platform Development

2+ Years of development Healthcare Platform with PoC using Xcloud Funded by Reliance Jio Series A

2020- Developed E2E Digital Healthcare

HIMS EMR/EHR

Pharmacy

LIMS

RIS/PACS ER

Advanced BI

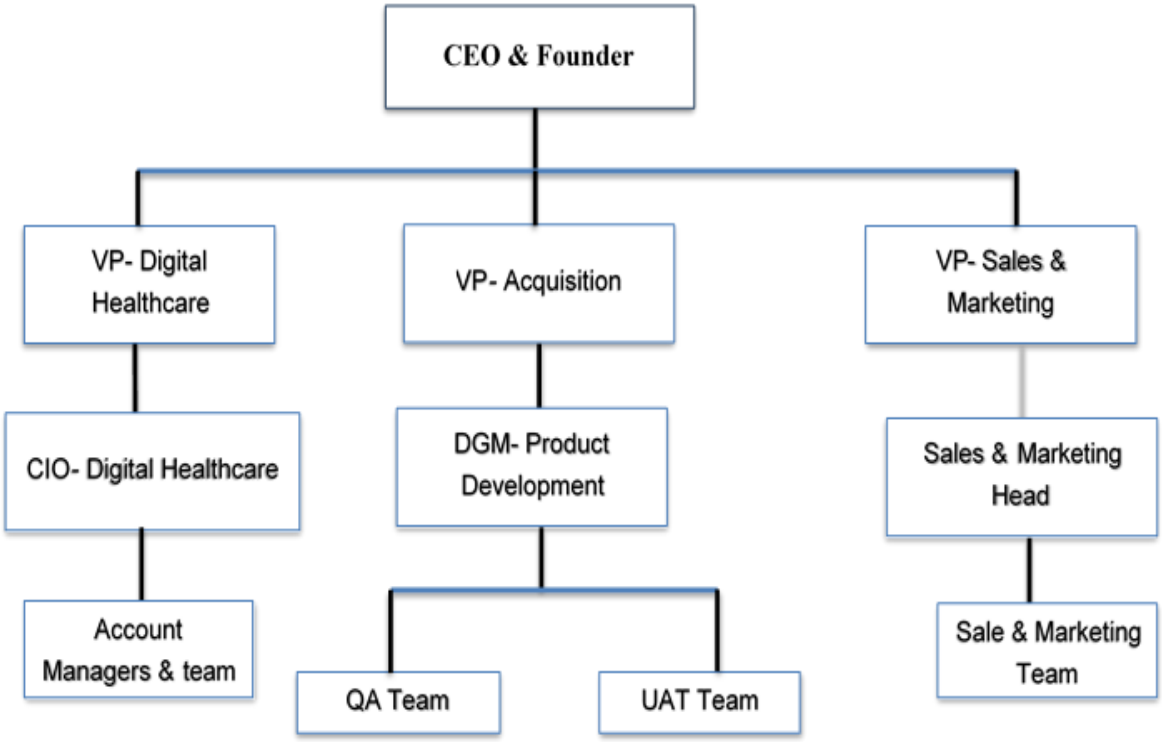
AI read

2021- Field Trial

100 employees low burn rate

80% healthcare experts with computer science

Organization chart For KareXpert



Specialties

- Healthcare Cloud, Cloud
- BigData, IoT
- Telecom
- Digital Healthcare
- Software
- Software, karexpert, UHC
- Health, Medical, Hospital
- Doctor
- Patient
- Health Analytics
- HMIS
- HER
- HIS
- homecare, and remote care

Services Provided

SaaS- Digital Healthcare Platform

(Corporate & Large Hospitals, Government Healthcare, International Healthcare)

- **AI-Ready Technologies (System of Intelligence)**

AI/ML ready healthcare platform, brought to clients in partnership with global AI providers like Intel, Microsoft, etc.

- **Simple & Easy to Use (System of Interaction)**

  User-friendly & intuitive UI/UX platform which enables any stakeholder to start using our system with minimal training

- **Single Data Lake (System of Records)**

  Data in place with a single data lake and be AI-ready

- **Pre-Integrated out of the box**

  Every feature and module come pre-integrated out of the box. Client can Start using them right away

KareXperts Healthcare Modules (Services Provided)

50+ Healthcare Modules developed

- Digital Healthcare Platform
- Advanced HIMS
- EMR/EHR
- Telehealth
- LIMS
- RIS/PACS
- ERS
- Advanced BI
- Medical AI
- Blood Bank

Key Customers

- Centre for Sight- Mahindra Group of Hospitals
- JHM- Group of Hospitals, South Africa
- Paras Hospitals
- HCL Healthcare
- Reliance Industries Limited- Group of Hospitals
- Tata Steel- Group of Hospitals
- VNPT, Teleco Health Cloud & Jio India
- Kingsway Hospitals

Chapter 2: Process Flow of Implementation of KareXpert Digital Healthcare Platform

Healthcare information technology (HIT) has been defined as "the application of information processing involving both computer hardware and software that deals with the storage, retrieval, sharing, and use of healthcare information, data, and knowledge for communication and decision making".

KareXperts Provides Existing legacy solutions causing broken patient journeys, loss of revenue, poor operating efficiency, and substantial hidden costs. It also affects the ability of the hospital to give a higher quality of care to patients and make it more affordable.

- KareXpert is empowering many new providers who want to provide virtual care to patients targeting different specialties.
- KareXpert platform becomes really handy for them as it comes as an out of the box solution for them without any upfront cost.
- While the recipe across providers varies, common among these new business models are delivery of hyper-coordinated care, better collaboration among stakeholders, and the use of Big Data and advanced analytics.
- Such models intend to reorient traditional healthcare towards a more integrated healthcare to provide high-quality, accessible and affordable care.
- These technologies have enabled the facilitation of many different business models like virtual care, remote care, home care etc

Features of the Modules

- Entails the use of electronic or computer support to enter physician orders including medication orders using a computer or mobile device platform.
- Computerized physician order entry systems were originally developed to improve the safety of medication orders, but more modern systems allow electronic ordering of tests, procedures, and consultations as well.
- These are usually integrated with a clinical decision support system (CDS), which acts as an error prevention tool through guiding the prescriber on the preferred drug doses, route, and frequency of administration,
- A patient portal is a secure online application that provides patients access to their personal health information and 2-way electronic communication with their care provider using a computer or a mobile device.
- **Symphony**- Platform Contains a collection of golden workflows Workflows is a collection of Digital (D) or Physical (P) interactions

Steps in the Implementation

Planning	Master Data	Cloud Provisioning	Customize	UAT	Training	Integration	Go live

Fig 2.1 Steps to go live

Step1- Planning (15 Man Days) Step 2- Master Data (10 Man Days)

Step 3- Cloud Provisioning (15 Man Days) Step 4- Customize (15 Man Days)

Step 5-UAT (5+15 Man Days)

Step 6- Training (5+agreed Days)

Step 7- Integration (5 Man Days)

Step 8- Go Live (25 Man Day

Task Performed in the Process of Implementation

- Attending Client Meetings

  During the meeting client requirements and other enhancement is discussed. Also, client basic concerns are Resolved and plan about the training of the staff is made and dates are fixed for the training.

- Testing UAT platform and finding bugs

  Before handling the client UAT platform team checks for any bugs or config required by testing multiple time different scenarios and on various categories of patient

- Giving demo & Training session to the Client
- Uploading Required Masters in the Platform
- Config mapping of the Platform before handling to the client

Modules covered in Testing UAT Platform

- Appointment
- Queue Management
- Registration
- OP Billing
- IP Billing
- Laboratory facility
- EMR
- Pharmacy
- OT
- Blood bank
- Patient portal

CHAPTER 3: PROJECT REPORT

INTRODUCTION

The evolution healthcare sector from manual to a system based evaluation should implicate better reach (both for the patient and the doctor), patient acceptance and should come at a feasible cost. Since the population rise, there has also been a rise in mortality which calls for a system based evaluation as well as storage of medical information to reduce the workload and hassle of both doctors and patients. The EHR of course faces a stiff opposition due to low patient acceptance and short reach. The talk that surrounds the idea of an EHR mainly targets to its complex operations it has to use to better the facilities provided. The EHR being a system also has to unify data from various national programs that is if the people are benefitting from the programs itself. In addition, making people understand the whole idea is a cumbersome task, overcoming which will not only increase its population coverage but may benefit the patient multifold.

TECHNOLOGY ADOPTION IN HEALTHCARE

The orientation of several fields have changed since the onset of new problems. The healthcare has been the most developed one owing to recent pandemic as well as newly emerging diseases. Technology in the healthcare system has not only integrated with other fields but also has reduced the effort spent in achieving 100% health. Add to it 'personalization' and the AI powered devices run the market now. This makes it more advanced and superior in scale to other manual devices, thus being critical for healthcare professionals. Most often it it the time spent in achieving the facilities that affect a patient's acceptance towards these systems. Paperwork involving verification usually drains most of the masses ability to bear with the system. Technology added may make this nuisance go away and have better patient reach. It is now not only possible to record health data digitally but the data can now be shared to multiple users viz the doctor, patient themselves, laboratory technicians etc. which may also aid in better staff training.

DEVELOPMENT OF HEALTH INFORMATION MANAGEMENT SYSTEM

Health information technology management refers to utilization of health data for providing vital patient care or bettering it. Earlier the data used to be in forms of patient forms, performas, lab test results printed on a paper etc. This has been replaced today by digitally recorded data that can point to a specific data at just a single click. Todays system not only classifies patient according to the diseases but may also play an important role in identifying the development of chronic diseases depending upon the person's habits. This makes it a primordial tool of prevention which identifies the problem at the root cause much before it's onset. The program running this facility aka

EHR can asking be assessed online at any point of time and at any place, which means it, has the potential to be an universal tool. Although the implementation of EHR has been a debate but it's capabilities far outweigh it's drawbacks, implementing it will not only save precious time but at the same time will cater to the needs of critical care patients.

ELECTRONIC HEALTH RECORD SYSTEM

The implementation of EHR started in the form of EMR(Electronic medical records) . EMR although used synonymously has a different implication than EHR. A digital record in the database refers to an EMR, which can be internally developed medical record system while health information recorded digitally refers to EHR. The EMR even though paved the way for better availability of medical services still couldn't attain the required patient reach. EHR if implemented has to have a large database, a uniform one, which classifies patients as per their complaints in the hospital and puts them in categories that would aid the healthcare professionals into making their perfect diagnosis. The database has to be so large as to be in accordance with the national health programs benefitting the population. It also needs a search system to ease the process of finding medical information pertaining to the patient. This would benefit both to the doctor in finding crucial past histories and the patient in filing for health insurance claims.

An additional thing that an EHR can do is store the pretreatment as well as post treatment conditions of the patients, which can help in knowing the efficacy of the treatment given. The data collected has to be a variety of data viz the demographic data, allergies, dates of immunization, lab tests, stats of their health until now etc. The information can be shares or transferred via network-based systems and can be used in different healthcare settings. That is why the EHR needs to collect unified data across all fields.

EHR can be regarded as a system that not just classifies people according to their diseases but also improves treatment protocols. It improves communication between the patient and doctors as well keeping in mind their privacy issues. Collecting information as this from various aspects and grouping them can help the healthcare professionals in identifying and treating chronically Ill patients thus intervening in form disease prevention. EHR stores the conditions of the patient over a period of time and is most likely up to date easing the hassle of enquiring about the patients past history. It can be more effective in treatment of chronic lifestyle diseases such as obesity, cancer and diabetes. It can be considered as a tool of primordial prevention that is intervening in the habit-forming phase of life such as prevention of fast foods during childhood reduces the risk of obesity and hypertension in adulthood.

Although EHR looks superior to EMR, it lacks certain aspects such as transparency, portability and accessibility. On the other hand, EMR having all of these doesn't guarantee genuine information as stolen information or incorrect information could be

recorded into the system. The data can also be collected by an unknown thus breaking patient privacy privilege. The records that might have been recorded could have been written by a person whose handwriting is illegible which might lead to different lab tests being done or different medications being given. Now, interventions such as these can change the status of patient and thus need to be digitally documented. With the EHR we can have standardized data and input which may in turn leas to increased efficiency of treatment. It is the sharing of medical information between different EHRs that may have a massive impact on the healthcare sector. It can share data to other field of operation such as in recording census and calculating mortality rates of individual areas. This system can also be used to quantity prevailing diseases in areas which in turn can be used as a yardstick for measurement of disease awareness among the mass viz use of mosquito nets in malaria prone areas. In far-flung areas, this can also be used in a shorter or more compact version depending upon the disease prevalence and thus increasing its reach, improved health monitoring etc.

Sharing data from EHR with the ambulance drivers can be an additional benefit apart from better paramedic training and surveillance along with better output and outcomes. The only drawback with this system is network in far areas might be inefficient in transferring health data due low connectivity. It's maintenance can be a huge task which brings forth the role of authorized healthcare providers in facilitating service. Patients can be taught although to interact with the system, increasing the margin for errors in case an operation goes haywire. The system also has to interact with multiple users, which might interfere with the working speed thus requiring a structured software that must cater to hundreds of users at a time.

Also sharing information out of healthcare sector such as insurance claims and it is impossible to have a boundaries. Also, to build such a large system will take time and with time new features need to be inculcated into it so that the mass benefit from it. It must adapt to various challenges that the growing population gives today keeping in mind about the problems faced by people in yester years.

LITERATURE REVIEW

Technology has a potential to influence every aspect and activity in health sector. We are currently pushing for universal health coverage in India in accordance with NRHM and NUHM, which is revolutionizing healthcare technology thus cutting cost and improving efficiency

Fortunately, today healthcare professionals in India do understand the potential of technology adoption and artificial intelligence, however, most of the leading hospitals adopting Information technology system for billing and their records, which is not exactly the standardized EHR in real sense. As said by Prof. Rajendra Pratap Gupta, Public policy expert who is serving on the Digital Health Guidelines group At WHO "Implementation of EHR needs a proper planning to make it reality, without it we cannot understand the proper functionality of artificial intelligence or Big data. In addition to that, he stated that we could create robust decision support system, which can be a big boost to Indian Healthcare system. It will also help healthcare professional to achieve accuracy in terms of healthcare practices".

According to DR. M.W. Ghori, Executive director at Medical and Health Information Management Association, EHR has the potential to increase Privacy, security and interoperability of healthcare data, which will help in the transformation of Indian healthcare.

According to a recent report by the Department of electronics and Information Technology (MeitY), the certification "Acceptance of electronic health records: road map of India" has highlighted that very few public hospitals have appropriate ICT infrastructure. Also stated that implementation of EHR has never been a technology challenge, but an adoption challenge and it can be only resolved when the healthcare professional realize the true potential of EHR.

We know Electronic patient record as a part of Electronic Health Record System. Healthcare professionals believes that it can be a suitable tool to support their core mission by enhancing the quality of documentation and standardized prescription procedure. In the other hand, they even stated that, it does not define the quality of care they give and again it is not possible for them to take out much time for this administrative task as stated by Tina Blengind Jenson in her article "How Healthcare Professionals Make Sense of an Electronic Patient Record".

Since the patient's innate ability to adopt to newer technologies have changed and since the doctors are being more focused on giving accurate data to the patient, EHR application has proven to be beneficial to both parties. According to Institute of Medicine, in today's fast competing medical fields, greater output and maximal efficiency cannot be achieved unless an EHR has been implemented. This new system might be an upgrade to an already existing EMR or it might have to do with adaptation to it.

The operations regarding EHR can be complex and will need perfect execution failing which it can be costly. As stated, my Moukheiber faulty implementation can not only cause huge loss margins but can also tarnish the reputation of an organization. It can also weaken the organizations' position in front of its competitors. As per Or, Dohan,Tan it might be difficult inputting experience of healthcare professionals into the EHR system since a technology like that will need many algorithms to work. Failure of implementation of an EHR may be due to a lot of things some of which maybe failure to adapt to a newer and hassle free technology, and different point of views of masses.

As deploying of such a large operation is sudden in India and is limited to corporate hospitals while being in the development phase in some private hospitals. Realizing what works and what doesn't work in its favor are important. This is a study done to gather raw data that might help the newbies that have just ventured into the field of healthcare.

The government of India has been pulling all strings to include various technology-based systems in healthcare reforms and also has instructed healthcare professionals, insurance companies to aid in the same. As per Malach and Baumol this has been done in order to provide the healthcare facilities at an effective cost. So far this has had a promising outcome, which means the implementation of EHRS as an integral part of the Indian healthcare sector has found great acceptance among the masses. It aims towards maximum adoption by the stakeholders in the sector.

This study discusses, clarifies which part of the system is most relevant to this particular implementation. For Indian hospitals to stay efficient and competitive in providing daily healthcare services, changes need to be made in the already implemented and outdated processes that run the system. This signifies upgradation of the whole information and network technologies in operation in the hospitals as to act as a competitive healthcare service provider.

Another researcher, Avijit Chowdhury, in his article "The Adoption of Mobile technologies in healthcare: The views of health professionals on information management systems in developing countries", tried to examine the attitudes of health workers (HCPs) in India that hinder information management practices by accepting. Portable technology in health care. This cross-sectional qualitative study used informal interviews with healthcare professionals in India. A team analysis method was used to analyze the discussions, which over time produced 3 major themes. The topics are medical education and training, Interoperability between HCPs, and patient health education. The findings suggest that HCPs associated with mobile technology in health care in India are often viewed more effectively, rather than as explicitly. The cell phone health technology used is seen as a tool for therapeutic purposes such as viewing diagnostic reports or providing initial information to patients, and much more. The concept of clear and quiet information is not uncommon among HCPs.

Therefore, the ability to share information on mobile health care technology is misinterpreted and often overused.

Ward R Stevens has developed a way of looking at the views of health professionals about the integration of information technology into practice. The methods used to conduct this study were twelve databases that were searched to identify research related to information technology. The result of this is the attitude of the staff to the acceptance of the IT practice and clarifies that education and training were a feature of the proliferation of IT systems. Some research should be done with quality and quantity on the roads.

According to Anant R Koppar, the operation of the EHR will lead to failure due to the complexity of the application of the system. It also implies that the quality of health care services is being replaced through Information Technology. This rate of failure is due to improper maintenance of past patient data, leading to inadequate treatment of patients by physicians. The study also reveals that the traditional method is preferred to keep the patient record in track during the patient's history. Employable Electronic Health Record (EEHR) programs can be performed in remote areas as they provide the basic function of the system, which prepares physicians to use the system efficiently and effectively to assist rural patients. The study mandates an EEHR workflow solution to improve health care delivery.

Mary E. Mortan studied physicians' views on the acceptance of electronic health records and sought to determine the technical, social, and personal implications of technology acquisition; tested on the TAM model. Physician personal boundaries included age, experience, previous computer use, and the impact of the health system and health system portal; where as social barriers include administrative support, physician involvement, physician independence, skills and patient-physician relationships. It has been identified that there has been an increase in the use of electronic health records due to government policy but the complexity of its use should be clearly understood. Engineers should understand the needs of health care workers and workflow. Unless also until developers understand physicians and physicians, the acceptance of electronic health records will not be improved. Since the research is done only from a physician's perspective, future research can be done from the perspective of other hospital users such as clinic staff and nurses; the study attempted to address the efficacy and workflow of physicians from the point of view of physicians using the technological adoption model. It also evaluated the use of integrated diagnostic theory and the use of technology from the perspective of doctors, nurses and clinical staff. The purpose of this study was to examine individual characteristics as well as social and technical factors that may influence the acceptance of EHR physicians.

METHODOLOGY

This report is based on a cross-sectional descriptive study, where I have collected data from healthcare professionals, those who are working in Hyderabad using questionnaire.

Objectives of the study

- **General Objective**- To assess the viewpoints of healthcare professionals have regarding the adoption of technology in healthcare system.
- **Specific Objective**
  - To understand the use of technology in healthcare sector.
  - To understand Electronic healthcare record system and its uses.
  - To understand believes of technology adoption among healthcare professionals and how electronic health record makes sense to them.
- The study Design- A Cross-Sectional Descriptive study
- Study Setting- Hyderabad, Telangana, India
- Duration of the study- 1st May to 31st July
- Study Population- All cadres of Healthcare professionals, who are presently working in any hospital or healthcare sector in the area Hyderabad, Telangana State, India. (i.e. professionals, paraprofessionals and lay health workers, who are involved in providing healthcare services to patients)
- Sample Size- 80
- Sampling Technique- Non-probability Purposive Sampling technique (Samples have been collected by filling the survey questionnaire with their consent through a google form. And healthcare professional who can be a best fit for the study followed by the inclusion and exclusion criteria)

  Inclusion Criteria
  - Healthcare professionals who are working in Hyderabad, Telangana during the study period.
  - All cadres of healthcare professionals are included

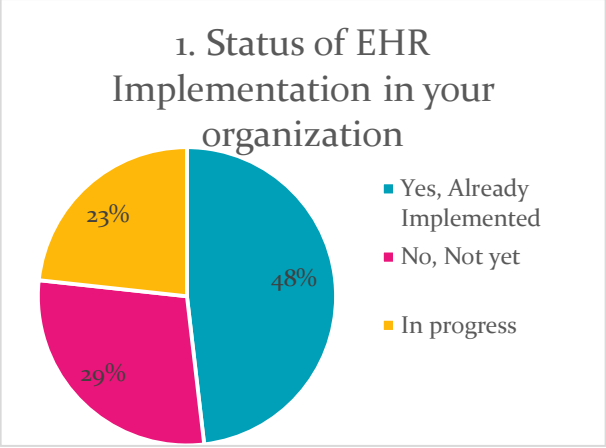
  Exclusion Criteria
  - Who are not associated with any kind of healthcare services in any organization and not working in Hyderabad region.
- Data Collection tool – Primary Data using Questionnaire
- Data Analysis- Microsoft Excel
- Expected Outcome- The findings of our study are expected to provide details on the shakedown phase of EHR implementation, where individual and hospital familiarity with the new system is highly variable. It will receive a combined measure of professional acceptance among health care professionals. In addition, this study is expected to provide some insight into the motives and barriers after the adoption of technology.

RESULT

All professionals consented to take the survey.

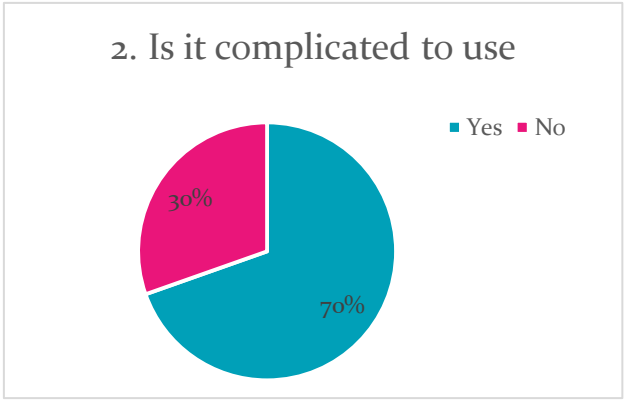
Majority of the subjects undertaking the survey aged between 20-40 years which means either they have already been in the healthcare sector for years or are planning to enter it.

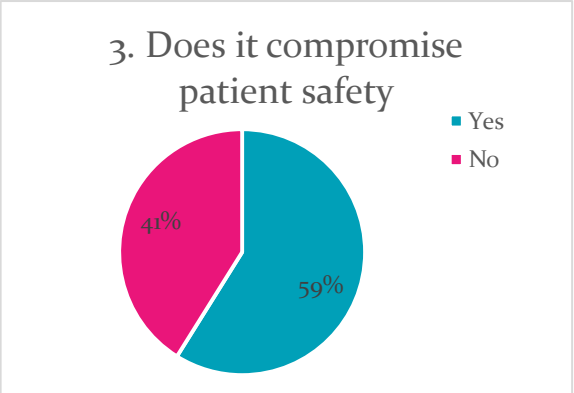
Different classes of healthcare professionals took the survey vis doctors, nurses, patient care managers etc. This signifies their intention to build an advanced system catering to multiple patients at a time.



- 48.2% of professionals were already working with an EHR, experience of which could be useful in Implementing it at a different spot. 23.2% hospitals are yet in the development phase, which means they could be helped with its deployment and 28.6% need to made aware of such a system so that healthcare efficiency could be increased in their fields.

- 69.6%found it easy to work with an EHR eliciting a positive response from the majority. The rest 30.4% found it difficult to work with, which might be due to it's complex infrastructure and operations.

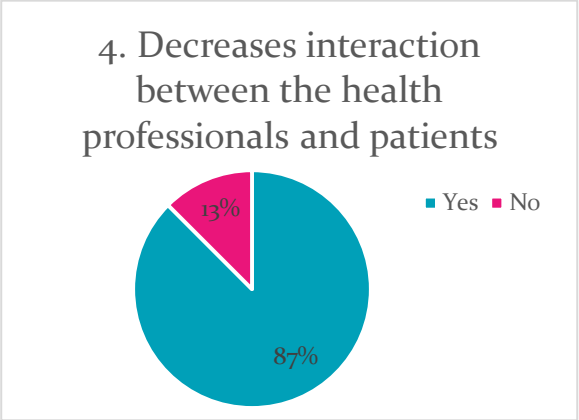


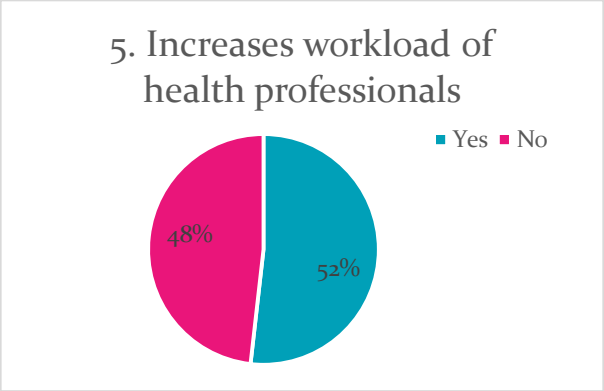


- Greater than half (58.9%)of the professionals believe it doesn't compromise patient safety that is their patient information security is solid. A staggering 41.1% voted for compromise in patient safety, might be an indicator

of a failure in proper implementation or could be due to its interoperability.

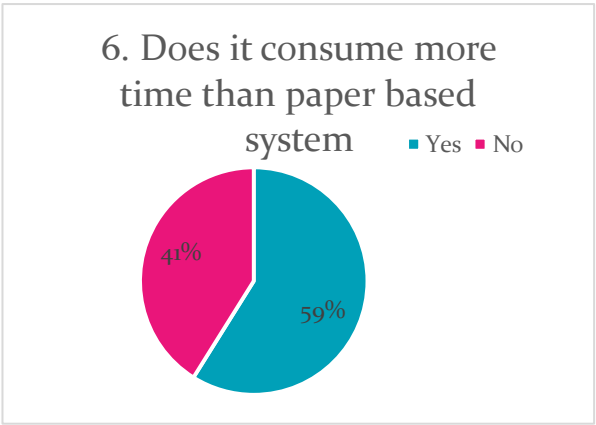
- Majority believe it decreases the doctor patient interaction since it's technology based. Could be just a transition idea, which might change with time.



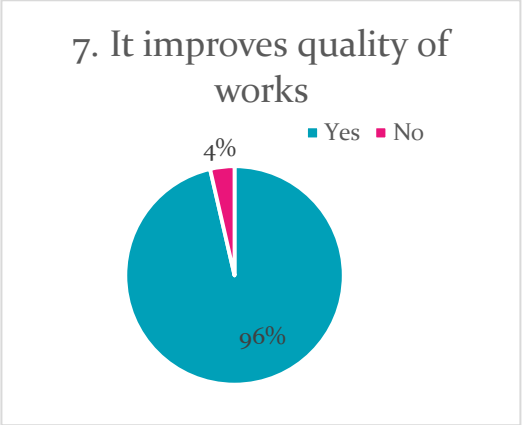


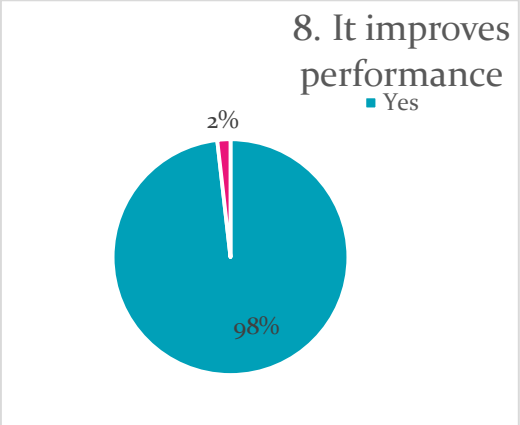
- It was believed by a lot many taking the survey that it would increase the workload for them, meaning they are already part of a manual based system that is putting too much of work on them. Alternatively, entering all the data after a long hectic duty hour may increase their workload.

- A staggering 58.9% believe an EHR takes more time than a paper based system, it can be the initial registration of the patient that would take time which is a must for the fed algorithm to work. Again, those who are not much technology savvy or having less skill on technology, this system can create a problem to them while feeding all the data over

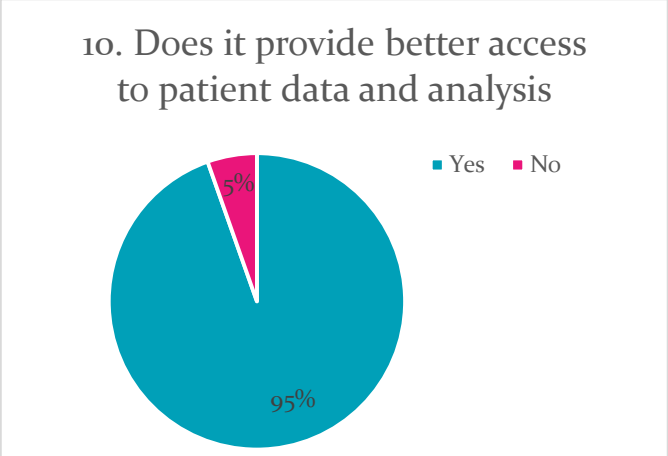


system. Ultimately, it will consume more while exploring things in order get the right one done.



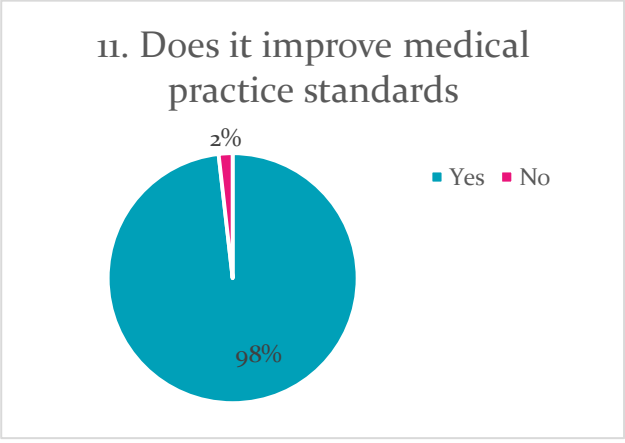


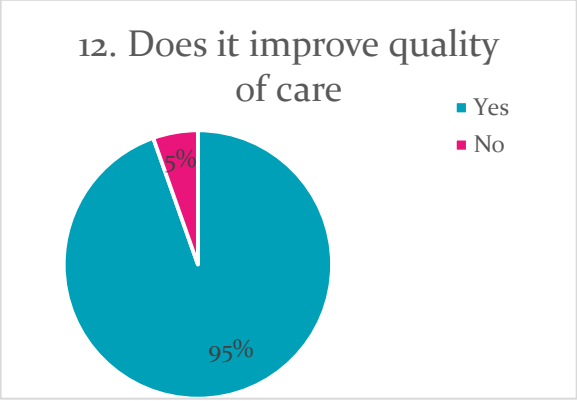
- 96.4 % believes it improves quality and 98.2 % believe it improves performance that means majority believe it can have a significant impact on the efficacy of the services provided.



- 95% of professionals believe, it provides better access to patient data and helps in analysis, meaning they have been benefiting from using EHR system.

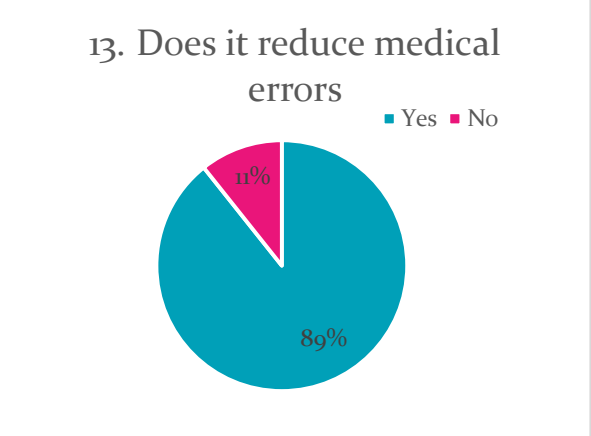
- 98% saying EHR improve medical practice standards that is staff skills and consciousness towards patient quality care

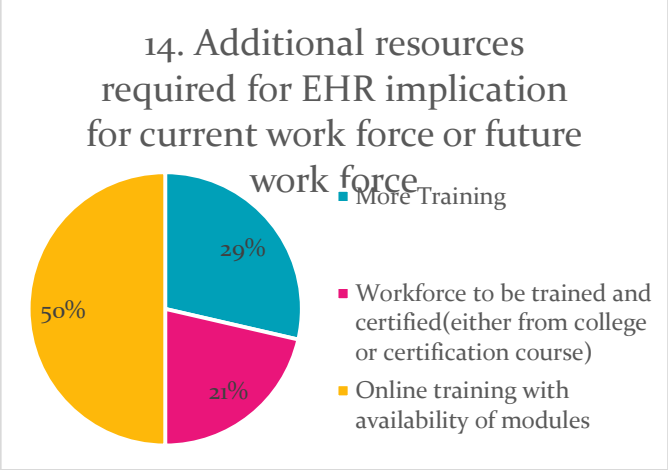




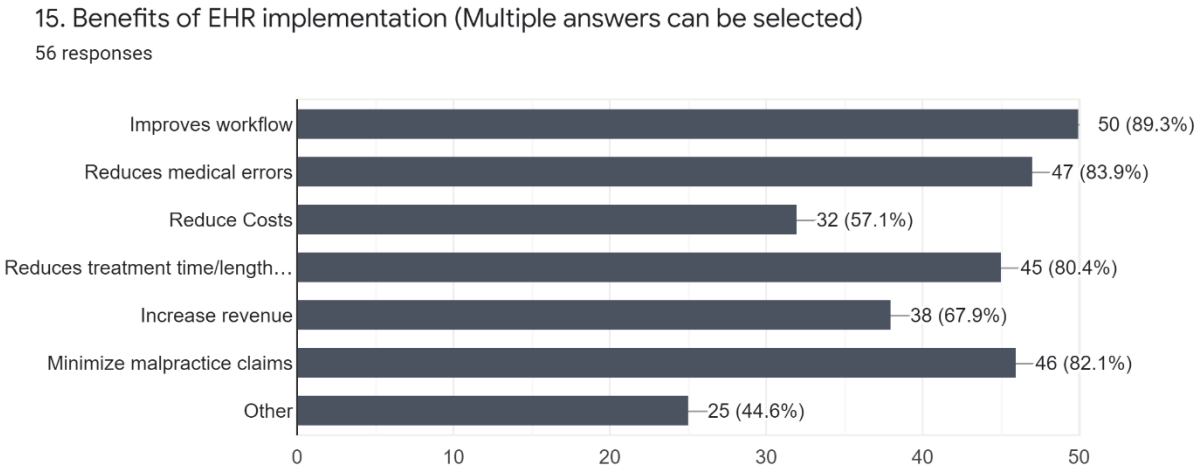
- Most professionals believe this system can improve the quality of care provided, might be an indicator of post treatment patient status.

- 89% believe through EHR medical errors can be reduced that is the margin of lives lost due to medical negligence can be saved.

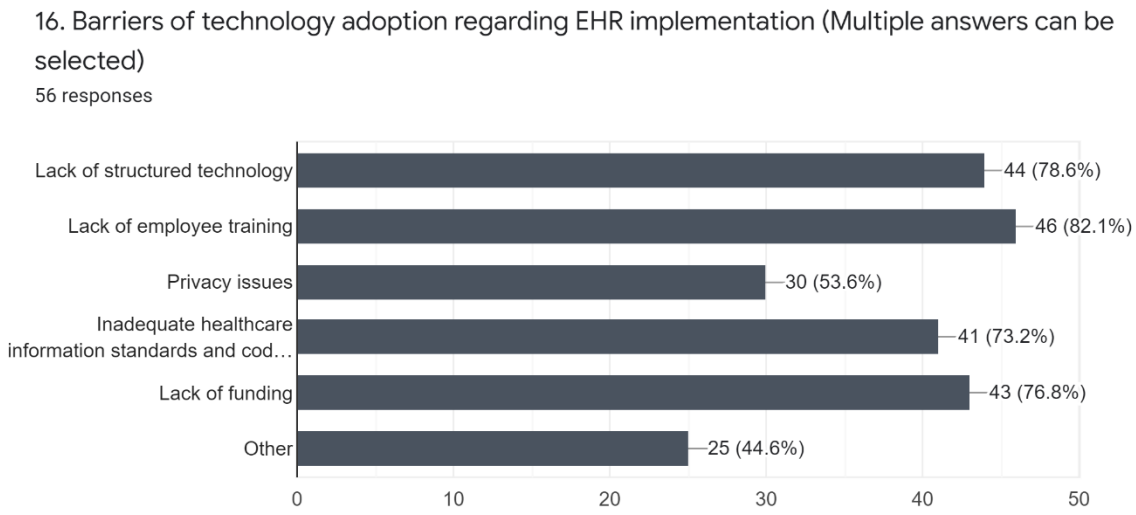




- From this study it has been seen that, professionals are interested to adopt but they are lacking training and adequate skills. Half of the respondents expressed that for the technology adoption in terms of EHR we need online training with availability of modules so that they can practice any time and get updated each day, where 21% respondents believe that workforce should be certified and well trained from recognized colleges only to work in EHR .



- The highest benefits of EHR implementation contributed by improvement in workflow followed by medical error reduction (83%), minimizing malpractice (82%) and reduction in treatment time/length (80%).



- It has been found that, there are multiple barriers, which is contributing to difficulty in technology adoption. As we can see in that graph Majority professionals (82.1%) thinks that training is the key to success and lack of proper training causing the problem in adoption of Electronic health record system. Also, some believe that complexity in infrastructure (78.6%) and privacy issues (53.6%) are equally responsible for difficulties in EHR system adoption followed by other factors like funding, proper healthcare information etc.

Narrative Responses

Some open ended questions have been given to the respondents in order to provide them freedom and space to share their viewpoint and opinion. This will ultimately help in getting different new ideas of multiple brilliant brains. The opinion which have been collected from the open-ended questions have been used in discussion part.

LIMITATIONS

This study is limited to a specific region of Telangana state, India. All the data I have collected from Hyderabad only using purposive sampling technique within the city, for which it cannot represent the entire healthcare professional in that cluster.

As I have taken all cadres of health care professional, there are people who are directly serving patients and people from administrative role as well. Therefore, it is difficult to identify the perception, as some are very much familiar with the use of EHR where some are not at all.

As I have a limited time duration for data collection, it affected the reach to maximum healthcare professional. In addition to that, I faced problem like knowledge deficit. Many professionals despite of using technology in healthcare setup, they are unaware of the term of EHR. Though I addressed this issue by explaining them about EHR and its use still it limited my survey to few participants.

Lastly, it is important to understand that we are in an early implementation phase, where not all are aware of EHR and its use. Therefore, I believe it is an unfinished story, which needs timely revision and testing to understand more in depth. As we are embedding technology more day by day, there can be more insight into this topic. It enhances the scope of the study over a wide range increasing sample size and widening the geographical region.

DISCUSSION

The study concludes that major portions of the professionals in the healthcare sector want an advanced system that not only store patient data but also minimizes cost and time adding to the quality of the medical facilities. It found that the younger generation of healthcare professionals embracing EHR system more than older generation. A greater portion of them believed it's easy to work with and had already been working within an EHR ecosystem. Since India is digitizing and is at a developing stage, an EHR implementation at its best might be in the best interest. Interoperability and patient interaction can be an issue as believed by many that can be owed to it's complex infrastructure. Some barrier for technology adoption that, despite of recognizing the positive benefits of interoperability of data and quality care, professionals are more worried about clinical time consumption.

The study also found that some believed security issue has been addressed. All in all it has been found in the study that EHRs improve the quality of works and the quality of care as well. A lot of effort need to be put in the structuring and implementation of technology in terms of technology infrastructure and training in order to build a fair understanding of use of Electronic health record system.Since, in many places shorter version of EHRs have been implemented and owing to the lack of interoperability, there is a dire need of creating a standardized national EHR.

According to the current situation, EHR deployment in Hyderabad is still in its infancy, and adoption of the new technology will always require time and a large number of training hours. This training should always be accessible to all in an easy-to-understand format, such as an online module and offline training sessions. Additionally, management should focus on providing full-fledged training to new employees to make the process simple and understandable. The same was found in the results of our survey of professional doctors and health care workers on the need for structural implementation of technology rather than forcible implementation, as well as training for all workers or employees

India has a healthy and fast-growing population that is increasing the mortality rate due to certain chronic health problems. The country is facing many new challenges such as the idea of implementing a national EHR system. Currently, Indian healthcare providers include private and public hospitals. Despite having a large majority of public hospitals, large numbers of people choose private due to the guarantee of better critical care and quality and shorter waiting time. Private hospitals boast of accurate equipment and services. Unless EHRs are widely used and successfully, adopted at all public health facilities, these organizations will continue to be overcrowded with long waiting times and inefficiencies that could jeopardize the health care system of Indians. EHRs, when used and approved by physicians, can effectively help, among other procedures, reduce lineage during the enrollment phase and reduce time and reduce the cost of treatment for individual patients. Take, for example, a considerable amount of money that can be invested in developing a medical history related to the

past and the way of thinking that may need to be repeated for the same person due to failure to properly manage patient records. The success of the EHR implementation depends on the attitude of the hospital staff, who must be procured in collaboration with the staff in order to be effective in the implementation of the EHR system. EHR systems can be used effectively in rural areas where people do not have basic hospital resources, which reduces hospital visit costs, visit times, time savings, and computerized patient data recording and efficiency. Privacy and security will be improved. This research benefits managers to improve safety and privacy issues and helps physicians to provide effective health care through EHR systems to patients.

CONCLUSION

This research carried out within the region of Hyderabad to find out the status of technology adoption in terms of use of Electronic Health Record system. This study tried to understand the perception regarding technology adoption among healthcare professionals. It gives a fair idea about the benefits and barriers of technology adoption in healthcare setup.

Adoption of technology in implementation of Electronic health record, Big data and Artificial Intelligence possess an important role in improvement of healthcare system. It can help in reduction of burden of diseases. It also has a greater impact on availability of clinical data and security. Currently many private multispecialty hospitals has been adopted technology in terms of using Electronic health record system. If the same can be successfully adopted by the entire government sector and other small healthcare setup as well, then Healthcare professionals and people from every category can be benefited by this. It can be only possible If India move towards achieving strong integrated health information system.

REFERENCE

- Hsieh P-J. Healthcare professionals' use of health clouds: Integrating technology acceptance and status quo bias perspectives. Int J Med Inform [Internet]. 2015;84(7):512–23. Available from: http://dx.doi.org/10.1016/j.ijmedinf.2015.03.004
- Pera N, Kaur A, Rao R. Perception of electronic medical records (EMRs) by nursing staff in a teaching hospital in India. Int J Adv Med Health Res [Internet]. 2014 [cited 2022 Jun 18];1(2):75. Available from: https://www.ijamhrjournal.org/article.asp?issn=2349-4220;year=2014;volume=1;issue=2;spage=75;epage=80;aulast=Pera
- Gagnon M-P, Ngangue P, Payne-Gagnon J, Desmartis M. m-Health adoption by healthcare professionals: a systematic review. J Am Med Inform Assoc [Internet]. 2016;23(1):212–20. Available from: http://dx.doi.org/10.1093/jamia/ocv052
- Jensen TB, Aanestad M. How healthcare professionals "make sense" of an electronic patient record adoption. Inf Syst Manag [Internet]. 2006;24(1):29–42. Available from: http://dx.doi.org/10.1080/10580530601036794
- Mabiyan R, HealthWorld ET. India bullish on AI in healthcare without electronic health records [Internet]. ETHealthWorld. 2020 [cited 2022 Jun 18]. Available from: https://health.economictimes.indiatimes.com/news/health-it/india-bullish-on-ai-in-healthcare-without-ehr/73118990
- Srivastava SK. Adoption of electronic health records: A roadmap for India. Healthc Inform Res [Internet]. 2016;22(4):261–9. Available from: http://dx.doi.org/10.4258/hir.2016.22.4.261
- Ganapathy K, Kanwar V, Bhatnagar T, Uthayakumaran N. "m-Health: A Critical Analysis of Awareness, Perception, and Attitude of Healthcare Among Providers in Himanchal Pradesh. North India". 2016;22(8).
- Malhotra P, Ramachandran A, Chauhan R, Soni D, Garg N. Assessment of knowledge, perception, and willingness of using telemedicine among medical and allied healthcare students studying in private institutions. Telehealth med today [Internet]. 2020; Available from: http://dx.doi.org/10.30953/tmt.v5.228
- Mehta N, Pandit A. Perceptions of EMR system by doctors in Pune (India). Indian j public health res dev [Internet]. 2017;8(4):540. Available from: http://dx.doi.org/10.5958/0976-5506.2017.00396.5
- Bajwa NK, Singh H, De KK. Impact of EHR technology implementation on physicians' job satisfaction. Int j appl manag technol [Internet]. 2019;18(1). Available from: https://scholarworks.waldenu.edu/cgi/viewcontent.cgi?article=1269&context=ijamt
- Sequist TD, Cullen T, Hays H, Taualii MM, Simon SR, Bates DW. Implementation and use of an electronic health record within the Indian Health Service. J Am Med Inform Assoc [Internet]. 2007 [cited 2022 Jun 18];14(2):191–7. Available from: https://academic.oup.com/jamia/article/14/2/191/863083?login=true