

Healthcare Provider Perception on Use of Electronic Medical Record (EMR)

By

Dilshad Pathan

*Dissertation submitted in partial fulfillment of the requirements of the degree
MBA Hospital and Health Management*

Academic year, 2017-2019



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TO WHOMSOEVER MAY CONCERN

This is to certify that Dilshad Pathan , student of MBA Hospital and Health Management from The IIHMR University, Jaipur has undergone internship training at Oakland System Pvt.Ltd, Nagpur from 4th February to 3rd May .

The Candidate has successfully carried out the study assigned to her 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 her all success in all her future endeavors.

A handwritten signature in blue ink, appearing to read 'Dean'.

Dean, Academics and Student Affairs
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A handwritten signature in blue ink, appearing to be a stylized 'W' or 'M'.

Assoc. Professor
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INTERNSHIP COMPLETION CERTIFICATE

The certificate is awarded to

Dilshad Parveen Israil Khan Pathan

In recognition of having successfully completed her
Internship in the department of

And has successfully completed her Project on

“Research on EMIR for Traditional Patient Care and Clinical Research”

Date: Feb 4th to May 3rd 2019

Organization: Oakland systems Pvt Ltd., Nagpur

She comes across as a committed, sincere & diligent person who has a strong
drive and zeal for learning.

We wish her all the best for future endeavors.

OAKLAND SYSTEMS PVT. LTD.

Director

Omkar Nakade

(Co-founder, Operations Head)



Meghna Karnik,

(HR)

CERTIFICATE BY SCHOLAR

This is to certify that all ethical issues have been considered while collecting data for my dissertation titled **To Study and Understand the Perception of Healthcare Provider on Use of EMR** and submitted by Ms. Dilshad Parveen Israil Khan Pathan Enrolment No 0559 under the supervision of **Dr. Alok Mathur** for award of MBA in Hospital and Health Management in Health and Hospitals of the University carried out during the period from 3/02/2019 to 4/05/2019 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 of Student



Signature of Mentor

Acknowledgment

The dissertation project, helped in providing me with both, a learning experience as well as a glimpse into the daily managerial level issues of this renowned company. I was fortunate enough to interact with their support and patience.

I would like to thank **M/s. Meghna Karnik (HR, and training)** for providing me an opportunity to carry out my dissertation at Oakland System, Nagpur

I want to express my gratitude and sincere thanks to my mentor **Omkar Nakade (Co-founder, Operations Head)** for his constant support and invaluable time-to-time guidance and kind of help in the completion of this project.

Finally, I acknowledge my indebtedness to the staff of the Hospital for support by guiding me throughout my dissertation period.

My sincere gratitude to **Dr. Ashok Kaushik (Professor Dean, IIHMR, Jaipur)** for his relentless support and guidance. My regards go to my guide at institute **Dr. Alok Mathur** for his very helpful attitude and valuable suggestions.

I would like to express my heartless thanks to my parents for their moral support, which always inspires me to perform best. And finally, credit goes to all my friends' colleagues who helped me in this study.

Sincerely,

Dilshad Pathan

MBA-HM (2017-2019)

ABSTRACT:

TITLE OF STUDY:

HEALTHCARE PROVIDER PERCEPTION ON USE OF ELECTRONIC MEDICAL RECORD(EMR)

Author: Dilshad Pathan

BACKGROUND:

Oakland system with the Meditrina hospital and VIMS Hospital has developed and operationalized a point of care electronic medical data system for managing the care. Most of the patient care and clinical research study protocols require the collection of core research data elements that provide specific detailed information about key aspects of medical care and medical information of individual research participants. “For clinical research and individual care, longitudinal studies, outcomes research, and public health reporting, an Electronic Medical Record (EMR) is increasingly being used to record and document this information. Individual Patient care and Clinical research have for a long time lagged in the implementation of adequate information technology (IT) infrastructure to enable networked collaborative research.

AIM AND OBJECTIVES:

AIM:

To study and understand the healthcare provider perceptions on Electronic Medical Record System (EMR) in two hospitals of Nagpur

OBJECTIVES:

- To study and analyse the process of patient data capturing in EMR.
- To analyse the challenges of users while Patient data capturing in EMR.

METHODS:

The study is **cross-sectional and descriptive** in nature which was carried out for a period of three-month duration at Oakland systems (which include **Meditrina hospital and VIMS Hospital**), Nagpur. Data were collected from hospital staff by conducting an interview session and group discussion. A sample of **200** reports was taken up for the study.

FINDINGS:

PROCESS BASED:

- 95 % of Users responded overwhelmingly about EMR being accurate in information, presentable and readable to use
- 97% indicated that the EMR has maintaining the confidentiality of patient information

CHALLENGE BASED:

- 55% of participants were experience problems while capturing data in EMR.
- The most common problems experienced:
 1. Lack of software support and hardware equipment
 2. Not enough training providing to users.
- Their main benefits to use of EMR:
 1. Helps to enforce the process
 2. users (especially clinicians and data operator) was that it is paperless

CONCLUSION:

This study evaluated the satisfaction, difficulties, and encouragement for data capturing in EMR users in Medent. Overall, though there are challenges with EMR use, most users were satisfied with the EMR for patient care and clinical research. The study has also found that users feel that quality of care has significantly improved with the introduction of the EMR system and that patient waiting time at the clinic has greatly reduced. It has also been learned from this study that with the introduction of the EMR, users can capture the data with the system with solving the user's difficulties within a short time (less than a day, some in a few minutes), effort and resources to capturing the data take less time.

KEY WORDS: EMR, Clinical Research, Quality of Care

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ABOUT THE ORGANISATION:

Oakland system private limited is a leading software company in Hospital Management Information System and paperless Hospital automation. It was established in the year 2010 by a group of highly experienced IT professionals who have worked extensively on building large scale business and customer-facing applications. The headquarter and development center is in Nagpur and subsidiary branches in New Delhi, Mumbai, Ahmedabad, Guwahati, Pune , Hyderabad, India California, US and Moscow, Russia.

What is MEDNET:

Revolutionary software for all your healthcare needs to be tailored for the India audience.

A complete solution to solve deep domain issues by automating and enable paperless processes in hospitals, Nursing stations, Diagnostic labs, and Pharmacies.

- ✓ Better patient care
- ✓ Time – Saving
- ✓ Predictability
- ✓ Ensuring Process
- ✓ Cost Saving
- ✓ Better decision making
- ✓ Compliance

Vision:

We want health care data to be available with click of button. Technology be used to disruptively improve existing Healthcare practice.

Mission:

Through technology we hope to make medical practice paperless, easy predictable, accurate and time saving.

Value:

Self-belief, Aggressive learning, Ownership /Responsibility, Teamwork.

SUCCESS STORIES:

2010 - Company Registered Nagpur Office

2012 – Clinical Module 2 clinical piloted

2013 – 5 Installations core group Established

2014 – 10 Million +Patients Regi.

10000 + Users

RIS Launched

800 Bed Hospital

Delhi office started

2015 – Mobile app launched.

2016 – 1000 + users, 10 Million + Records

2017 - 170 +Installations

2018 – 5000 + No. of Beds, 50 Million+ prescriptions

DIFFERENTIATORS:

- ✓ Total Healthcare solution company committed to ending to end solution.
- ✓ Module tailored for different specialties including – Oncology, Cardiology, Gynaecology, Obstetrics, and IVF
- ✓ Standardized scoring used – GCS, Apache II, SPOFA, GPLA, APGAR, EURO.
- ✓ TNM cancer staging used.
- ✓ Implemented Green Field Project and Brown Field Project with turnkey solutions.
- ✓ Very easy to use – Innovative, Lucid design having enhanced user experiences “Click & Go”
- ✓ Technically Superior: Scalable, very secure and a web-based solution.
- ✓ Users are free to use any operating systems of their choice.
- ✓ Mobile app for a patient to get their medical data on the phone including features like downloading and sharing.



MEDITRINA HOSPITAL:

- ✓ “Meditrina the temple of healing is committed to providing ethical, reliable, high quality and cost-effective healthcare services with care and compassion to ensure complete patient satisfaction. “
- ✓ We intend to continuously strive to improve the quality of our health care services by adopting latest technology and equipment to strengthen our medical processes and procedures.
- ✓ Meditrina Institute of Medical Sciences has responsive, caring and efficient administrators, nursing staff and technicians coupled with dozens for consultants in their respective field of medicine with a never-ending focus on service and medical excellence to deliver patient-centric services round the clock. Built over 75,000 Sq. Feet, Phase 1 has over one hundred beds with four state-of-the-art Modular Operation Rooms.
- ✓ Meditrina Institute of Medical Sciences is also equipped with a Dialysis Unit, Endoscopy Suite, Cardiac Ambulance, State-of-the-Art Radio-diagnostics and NABL Accredited Pathology Lab.
- ✓ Within a short period since its inception, Meditrina Institute of Medical Sciences has become a leading health service provider in central India. We fulfill the need of the community in its chosen field of super specialties like Neurology, Orthopedics, Cardiology, Gastroenterology, Urology, Aesthetics and Minimal Access Surgery.

- ✓ Meditrina Institute of Medical Sciences has acquired the NABH (National Accreditation Board of Hospitals & Healthcare) accreditation, the highest and the most stringent quality standards institution in India and the National authority in healthcare accreditation.

VIMS HOSPITAL:

- ✓ The Hospital offers advanced services for the treatment of heart conditions including Minimal Access Cardiac Bypass surgery
- ✓ The Hospital provides a wide spectrum of Super Specialty Services in the field of Neurology, Neurosurgery, Urology, Kidney Transplant, Nephrology, Gastroenterology and Surgical Gastroenterology, Renal transplant, Orthopedics including Spine Surgery, Joint Replacement & Sports Medicine, Cosmetic & Reconstructive Surgery, comprehensive Mother & Childcare including advanced IVF.
- ✓ In addition, process driven Critical Care services, along with the most advanced Diagnostic and Imaging facilities, provide the necessary backbone for patient care for holistic, comprehensive and contemporary care to patients.

VISION:

To create a patient centric tertiary healthcare organization focused on non-intrusive quality care utilizing leading edge technology with a human touch.

MISSION:

- ✓ Achieve professional excellence in delivering quality care.
- ✓ Adhere to national and global standards in healthcare.
- ✓ Ensure care with integrity and ethics.
- ✓ Provide quality healthcare to all sections of society.

CHAPTER 1

BACKGROUND AND JUSTIFICATION

1.1 INTRODUCTION:

- Most of the patient care and clinical research study protocols require the collection of core research data elements that provide specific detailed information about key aspects of medical care and medical information of individual research participants. Clinical Investigation requires the collection of information about research participants from their medical past and healthcare experiences. For clinical research, longitudinal studies, outcomes research, and public health reporting, an Electronic Medical Record (EMR) is increasingly being used to record and document this information. Individual Patient care and Clinical research have for a long time lagged in the implementation of adequate information technology (IT) infrastructure to enable networked collaborative research.

- It has been deemed valuable by the workgroup and larger health care community that enabling the use of information from health care settings would improve the productivity and effectiveness of clinical research processes. The broad topic of clinical research incorporates many domains of data and their transactions. A high-level survey of the landscape of standards and interoperability stipulations was conducted by the workgroup. Subsequently, a workgroup established a vision document describing the difference between the use of EMR in patient care and clinical research. Thereafter, the group used a prioritization process to map out incremental steps to accomplish the goal of EMR information use for Patient care and clinical research.
- The highest priority was given to the ability to extract a core set of research data elements from the EMR into clinical research systems and for the patient care also. This Value Case comprises the first contribution and provides a foundation for future Value Cases to define processes for EMR support of patient care and clinical research globally.
- Data from the electronic Medical record (EMR) can be a commanding tool for research. However, the researcher must be aware of the fallibility of data collected for clinical purpose and biases inherent to EMR data to conduct sound health and outcome services research. The innovative method is currently being developed to improve the quality of data and thus our ability to draw the conclusion from studies that use EMR data.
- Health service research is a field with research that lives at the intersection of health policy, management, clinical care delivery to seeks to answer the question. To being address this question, researchers need a large volume of data across multiple patients, across different types of health delivery structure and across time. This simultaneous growth of this research in the past 15 decades has coincident of the development of electronic medical record numbers of providers who make use of them in their workplace. The EMR provides a large quantity of raw data to fuel the research, both at the granular level of patient and provider and at the aggregated level of hospital, state, and nation. collected or added to obtain the final research repository.

Data from electronic health records (EHR) can be a powerful tool for research. However, researchers must be aware of the fallibility of data collected for clinical purposes and of biases inherent to using EHR data to conduct sound health out - comes and health services research. Innovative methods are currently being developed to improve the quality of data and thus our ability to draw conclusions from studies that use EHR data.

1.2 PURPOSE OF STUDY:

The purpose of this study was to evaluate user's needs, difficulties, and challenges faced while capturing data for patient care and clinical research in the EMR system introduced by Medent.

1.3 SIGNIFICANCE OF THE STUDY:

Medent (Hospital Information System) is assisting the private hospitals in Nagpur to address the human resource crisis in healthcare by focusing on improving the efficiency and effectiveness of the existing limited workforce through the deployment of reliable, easy to use electronic systems for maintain the patient clinical information and for clinical research. So far, these electronic medical systems have been deployed at more than fifty plus hospitals and clinics throughout Nagpur. EMR is helping to maintain the daily patient health record and how EMR is useful in Clinical Research and what are challenges users faced while gathering the data, using the EMR for both the purpose is enough or not.

1.4 DATA ANALYSIS PROCESS:

- Direct observations, interviews and focus group discussions with users were used to collect data from study participants. At every site the investigator was immersed in the setting, acting as an unobtrusive observer (ethnographic approach).
- The behaviour of users and Hospital staff, including interactions between users, and the system, were closely noted (field notes of what was being experienced, learned through interaction with other people and what was being observed was documented and expanded into a more descriptive and narrative form).
- Feedback from users during interviews and focus group discussions were collected by the questioner. Data collection tools were pretested for validity and feasibility and appropriate corrections were made before the actual study was done.
- EMR effectiveness was measured using the five primary constructs, namely system quality, information quality, service quality, usage and user satisfaction with EMR. They were primarily used to get users' perspectives on both technical and behavioural aspects of its usage.
- Items for the questionnaire were formulated in line with the five constructs and were operationalized as follows: system quality, information quality, and service quality were evaluated as aspects of 'quality of EMR' and were defined as the evaluation of EMR quality, its outputs, and its responsiveness.
- The attributes for the quality of EMR include accuracy, adequacy, timeliness, user-friendliness, availability, and reliability amongst others. Usage of EMR is the extent an EMR is being used in completing patient-related tasks by users and was measured using one attribute –self-reported frequency of use and triangulated the user self-reports with what the system shows as usage by them.

CHAPTER 2:

LITERATURE REVIEW

1. *A systematic review of computer-based patient record organizations and quality of care: more randomized clinical trials or a bigger approach?* By Cyrille Delpierre Lise Cuzin Judith Fillaux Muriel Alvarez Patrice Massip Thierry Lang

- This study was done for to analyse the impact of computer-based patient record systems (CBPRS) on medical practice, quality of care, and user and patient consumption. Selected articles were published from 2000 to March 2003. CBPRS was defined as CPU software calculated to be used by clinicians as a shortest aid in clinical decision making. To be included, the systems should have recorded patient characteristics and obtainable online advice, or information or reminders specific to clinicians during the consultation.
- Twenty-six trainings were selected. The use of a CBPRS was declared favourably by physicians, with studies of consumption being mainly positive. A positive influence of CBPRS on preventive care was experimental in all three studies where this principle was examined. The 12 studies evaluating the impact on medicinal practice and guidelines agreement showed that positive experiences were as everyday as experiences presentation no benefit. None of the six studies analysing the impact of CBPRS on patient outcomes reported any benefit.
- CBPRS increased user and patient satisfaction, which might lead to significant enhancements in medical care practices. However, the studies on the impression of CBPRS on patient outcomes and quality of care were not undoubted. Alternative approaches since social, cultural, and organizational factors may be needed to gauge the usefulness of CBPRS.

2. *Missing clinical and communicating health data in a large electronic health record (EHR) system* by Jeanne M Madden Matthew D Lakoma Donna Rusinak Christine Y Stephen B Soumerai

- Recent massive investment in electronic health records (EHRs) was established on the statement of improved patient safety, research volume, and cost savings. However, most US health systems and health records are split and do not share patient information. Our study associated the information available in a typical EHR with more complete data from insurance claims, converging on diagnoses, visits, and hospital care for depression and bipolar disorder. We included insurance plan members aged 12 and over, allocated throughout 2009 to a large multispecialty medical practice in Massachusetts, with diagnoses of depression ($N = 5140$) or bipolar disorder ($N = 462$). We removed insurance claims and EHR data from the primary care site and compared diagnoses of interest, outpatient visits, and acute hospital events (overall and behavioural) between the 2 sources.

- Patients with unhappiness and bipolar disorder, respectively, averaged 8.4 and 14.0 days of outpatient behavioural care per year; 60% and 54% of these, respectively, were lost from the EHR because they occurred offsite. Total outpatient care days were 20.5 for those with unhappiness and 25.0 for those with bipolar disorder, with 45% and 46% lost, respectively, from the EHR. The EHR missed 89% of acute psychiatric services. Study analyses were absent from the EHR's structured occasion data for 27.3% and 27.7% of patients.
- EHRs inadequately capture mental health diagnoses, visits, specialty care, hospitalizations, and medications. Missing clinical information raises concerns about medical errors and research integrity. Given the fragmentation of health care and poor EHR interoperability, information exchange, and usability, priorities for further investment in health IT will need thoughtful reconsideration.

3. *Physician gratification with electronic medical records in a major Saudi Government hospital by HanaAlharthi PhD SalmaRadwan , BSSukainah Al-Muallim BSTuwaileb ZainabBS*

- The purposes of this study were to measure physician satisfaction with a recently introduced electronic medical record (EMR) system and to control which of the separate attributes of EMR were related to physician fulfilment. One year after introduction of an EMR system, doctors in an inpatient department were asked to answer a self-administered survey. Pearson's correlation constant was used to determine which attributes were significantly related to overall satisfaction with the system. Linear regression analysis was then performed to examine the meaning between the three main domains of the questionnaire and overall gratification with the system, with adjustment for physician demographic characteristics.
- A total of 115 physicians answered the survey. Only 40% were contented with the system overall. The best analysts of overall support were performance in the form of speed, integration with workflow, and patient material, such as accuracy, wholeness and timeliness.
- Physicians were normally not satisfied with the system. Continued calculation of such systems and feedback from users should guide future selection and implementation.

4. *Electronic health records application: An evaluation of information system impact and possibility factors by Lemai Nguyen, Emilia Bellucci Linh, Thuy Nguyen*

- This paper provides a review of EHR (electronic health record) requests around the world and reports on conclusions counting benefits and issues related with EHR application. A systematic literature review was conducted from peer-reviewed scholarly journal magazines from the last 10 years (2001–2011).

- The search was showed using various publication gatherings including Scopus, Embassy, Inform it, Medline, ProQuest Health and Medical Complete. This paper reports on our analysis of preceding empirical studies of EHR applications. A mix of evidence-based positive and wicked impacts of EHR was found across different evaluation dimensions.
- In addition, several contingent factors were found to contribute to successful implementation of EHR. This review confirms the potential of this knowledge to aid patient care and clinical certification; for example, in improved certification quality, increased management efficiency, as well as better quality, safety and organization of care. Common negative impacts comprise changes to workflow and work disruption.
- Mixed observations were found on EHR quality, adoption and gratification. The review warns future implementers of EHR to carefully assume the knowledge application exercise. The review also informs healthcare breadwinners of contingent factors that potentially affect EHR development and application in an organisational setting.

5. *Patient gratification with electronic medical/health record: A methodical review by jailin Liu, Li Lue, Rihu Zhang, Tingting Huang*

- Rationale and aim: Organizers and barriers to gratification after application of the electronic medical/health record (EMR/EHR) are significant to comprehend as patient gratification is linked with development in health care and expressive use of EMR/EHR. The objects of this systematic review were to evaluate patient satisfaction after implementation and to synthesize obtainable factors regarding the estimates of the patient satisfaction with EMR/EHR.
- These factors may help vendors to better design EMR/EHR and to assist in if direction for development of research in this field. Methods: Data foundations for the study included reports of studies from the Medline, Ovid, Springerlink, EBSCOhost, Embase and Wiley Online Library, and penetrating of indexes of review and other articles. Our presence standards were the imageries of patient consummation after operation of EMR/EHR. Results: Searching the online database resulted in 1425 articles and 58 articles from reference lists
- After eliminating duplicates and measuring against the assortment criteria, 41 articles were for further full-text review. After cautious analysis, 33 articles were excluded. Eventually, a total of eight articles met presence criteria and were assessed. Conclusions: These studies showed a positive patient gratification with EMR/EHR, but more rigorous studies should be carried out to more precisely quantify and describe the impact of EMR/EHR on patient satisfaction.
- Due to many factors influencing patient fulfilment with EMR/EHR, more research is needed to understand these factors before more concrete capacities of satisfaction can be developed to help researchers develop effective evaluation satisfaction.

6. *A Complete Review of an Electronic Health Record System Soon to Assume Market Ascendancy by Parting of Pastoral Care, CHI St. Luke's Health/Baylor St. Luke's Medical Ctr, and UT-MD Anderson Cancer Centre, Houston, Texas, United States*

- Federal and state orders have compelled **healthcare systems** to adopt “meaningful use” electronic health record (EHR) systems. Off-the-shelf, onthe- spot, one-source EHR systems such as EPIC® have become over-all choices. Indeed, EPIC® recently took a large proportion of the Houston Texas Medical Center (TMC), CVS Pharmacy mini-clinics, and extended into academic institutions. Current reported estimates are contentious but vary between 20- 47% of the EHR market share. Therefore, it is only sensible to conduct a review of EPIC.

7. *Electronic Medical Record application in nursing repetition by Bridget Anne Steiner*

- This is a review of the current works to discern what effects need to be current in an electric medical record (EMR) request for it to be fruitful for nurses. An extensive literature search was did by using databases CINAHL, MEDLINE, and Health Reference Centre for primary sources of research that exactly addressed EMR application and nursing. A coding scheme was industrialized and applied to each article for examination. It was found that fit of the EMR with nurse functions, education, and positive nurse attitude were the three most common factors associated with fruitful EMR implementation for nurses. Lack of computer system excellence, lack of fit of the EMR with nurse functions, and time supplies of its use were most commonly associated with lack of success.

CHAPTER 3:

METHODOLOGY

AIM:

To study and understand the healthcare provider per satisfaction on Electronic Medical Record System (EMR) in Nagpur

RESEARCH QUESTION:

- What are the challenges faced by the user during patient data capturing in EMR?
- What are the factor influencing to users for using EMR in Meditrina and VIMS Hospital, Nagpur?

OBJECTIVES:

- To study and analyse the process of patient data capturing in EMR.
- To analyse the challenges of users while Patient data capturing in EMR.

PROBLEM STATEMENT:

Despite enormous investment worldwide in computerized health information systems their overall benefits and costs have been rarely fully assessed and evaluated. Since Medent (Hospital Information System) started implementing EMR in private hospital eight years ago, no study has been done to evaluate whether the system meets its intended goals or not, this study only evaluated only one area of the Electronic Medical Records (uses of EMR for the Patient Care and Clinical Research). EMR is helping to Maintain the Daily Patient health record and how EMR is useful in Clinical Research and what are challenges users faced while gathering the data, using the EMR for both the purpose is enough or not

SAMPLE SIZE:

200 (100 from Meditrina Hospital Nagpur and 100 from VIMS Hospital, Nagpur)

SAMPLING:

Convenient data sampling

RESEARCH DESIGN:

Descriptive Cross-Sectional Study

RESEARCH APPROACH:

Quantitative and Qualitative Method (The study used qualitative research methods because it mainly focused on procurement subjective knowledges and experiential behaviours of EMR

users. Quantitative investigation methods were used where pre-defined variables like individual data and type of occupation of users were obtained.)

DATA COLLECTION TOOLS:

The study used a normal review, emphasis group conversation leader and an comment guide for data group.

DATA MANAGEMENT ANALYSIS:

This section describes data management and analysis methods and tools used to analyse the data.

QUALITATIVE DATA ANALYSIS

Transcription of recordings and typing of field notes was done soon after each data collection event. Tapes of interviews and focus groups were processed after each session; they were not allowed to accumulate. All field notes were typed as soon as the data collector had expanded them. The investigator and the data collector held regular meetings for further synthesis and interpretation of themes. Analysis of the data was interpretive (explain the meaning of words said and actions) and iterative (repetition of uttered words). Credibility and trustworthiness of data analysis were enhanced by rigorous checking of interview transcripts, replaying of the tape recorder, a detailed review of field notes and debriefing sessions after interviews by the investigator and the data collector. All interviews were in English.

QUANTITATIVE DATA ANALYSIS:

Data was entered manually into the software application and analysed. Graphs and charts were created using Microsoft Excel.

STUDY BOUNDARIES:

This study had several limits.

- The first one was the high staff turnover observed in all the two hospitals where a trained and skilled staff keeps being transferred from one facility to the other or from one department to a different one. This is what led to the limited sample size and made it difficult to sample the study participants. This is also why all users were interviewed to help get enough participants.
- The second limitation is that the study was only done in one region of Nagpur and was only done at the private hospital level, users at the central hospital and health centre level might have different experiences and feelings about the EMR system.

- The third limitation was a lack of space in most areas for the data collector and investigator to adequately be immersed in the setting and act as an unobtrusive observer to properly observe the behaviour of users and patients, including interactions between users, patients, and the system. Despite these limitations, the outcomes and information obtained are enough to generalize users' feelings on the EMR system. The other limitation was the lack of funds to cover all sites using EMR. Time was also another limitation because the study was supposed to be completed within a specified period to meet the academic requirements

ETHICAL CONSIDERATIONS:

Participation in the study was strictly voluntary through written agreement. The proposal did not need the College of Medication Research and Ethical Committee (COMREC) approval because though it was both qualitative and quantitative study, the data group was not expressively or expressively "invasive" and did not involve participants' private, individual, intimate life stories, and knowledges. The study ran on EMR.

CHAPTER 4

RESULTS

DESCRIPTION OF PARTICIPANTS

The study had **200 participants**, and all gave written consent to participate. Participants differed with respect to profession, experience, length of use of the EMR, age, and were from two hospitals. The study took place in Nagpur that was using the EMR procured and run by the Medent, out of 200 participants, **100 were from Meditrina hospital, 100 from VIMS hospital**. The study had **110 (55%) female** participants and **90 (45%) male** participants. Table 1 and figure 1 below summarize the demographic data of the study participants.

AGE IN YEARS	FREQUENCY
20-25	43
26-30	50
30-35	42
36-40	40
41 and above	25

Table 1: Demography of Users

Table 1 above shows the age circulation of users. The smallest age group was **above 41yrs** and the maximum age group **26-30 yrs**. The mean age group was **30-35 years**.

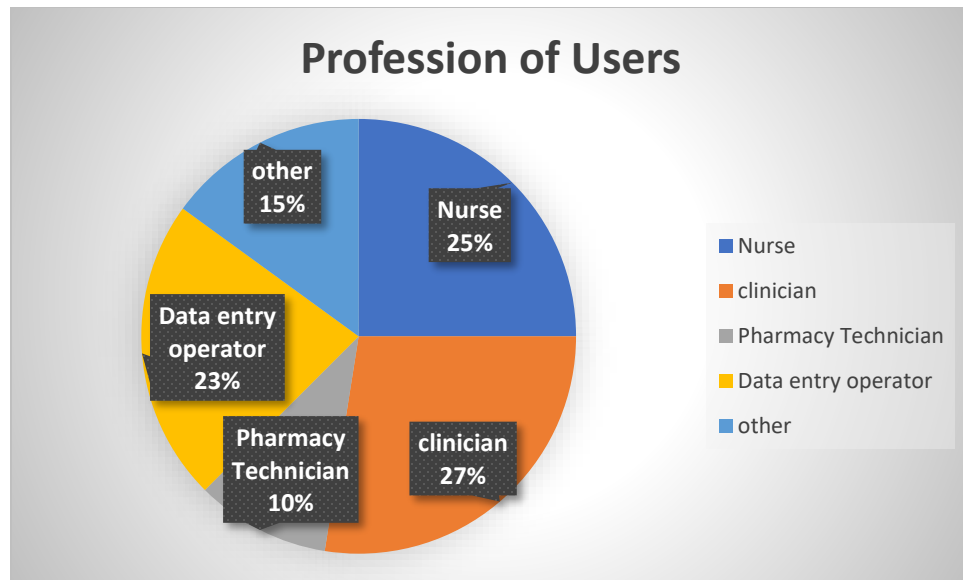


Figure 1: Profession of Users

Of the 200 participants, 25% were nurses, 27% were clinical officers, 23% were data entry clerks and 10% were Pharmacy Technician, 15% others (Billing, MRD, Radiology technician). Figure 1 below summarizes the profession of participants that took part in the study.

EXPERIENCE OF USERS:

TIME PERIOD	PERIOD WORKED IN THE HOSPITAL		PERIOD USED EMR	
less than 6 months	22	11%	25	12%
6-12 months	28	14%	35	18%
13-18 months	42	21%	30	15%
19-24 months	70	35%	60	30%
above 24 months	38	19%	50	25%
Total	200	100%	200	100%

Table 2: Experience of Users

Most participants (35%) had been working in the hospital for more than 19-24 months. The study also revealed participants (30%) had used the EMR for more than 19-24 months on the date of the interview.

PERFORMANCE OF EMR

Of the 2000 participants, **192 indicated that the EMR was Accurate in information clearer to presentable and readable to use**, 8 indicated that EMR was difficult to read and presentable, less accurate to use. Of the 200 participants, **196 indicated that the EMR was maintaining the confidentiality of patient information**, 4 indicated that EMR was, less maintain the confidentiality of patient information. These findings are summarized in the figure below.

Satisfaction OF EMR	YES	NO
Accurate/Readably/Presentable	192	8
Confidentiality Patient Information	196	4

Table 3: Satisfaction of EMR

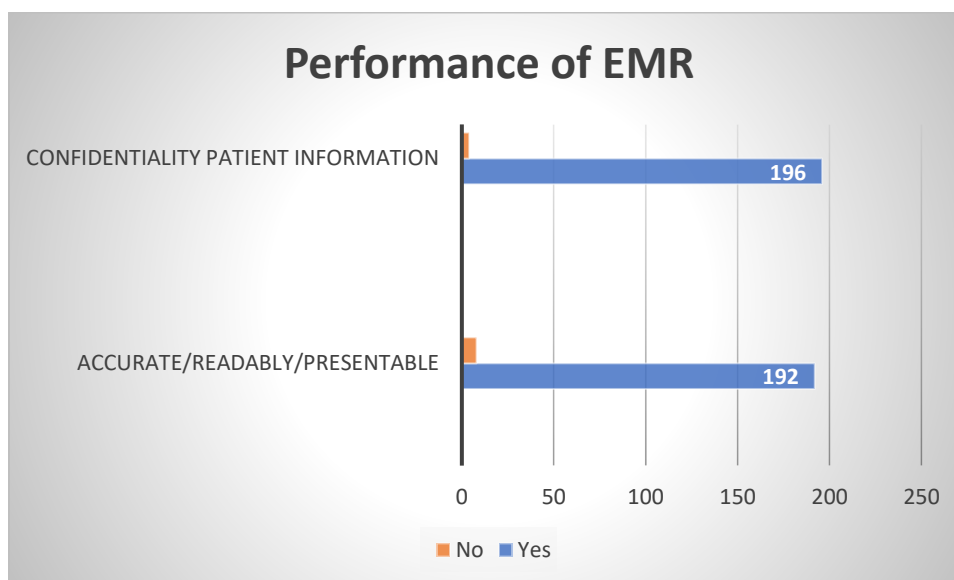


Figure 2: Performance of EMR

CHALLENGES FACED BY USERS WHILE DATA CAPTURING IN EMR:

The findings reveal that **142 of participants rarely experience problems** while capturing data in EMR. The most common problems experienced were; **Lack of equipment and hardware, unavailability software support and hardware equipment** user faced most of the difficulties while capturing the data it will reflect to delay in work.

NO. OF USERS FACED CHALLENGES DURING DATA CAPTURING IN EMR	FREQUENCY
Yes	90
No	110

Table 4: Number of users faced challenges during data capturing in EMR

Most of these problems are resolved within a day. At times they are repaired by the teams on the ground after calling and getting advice from Medent staff, at times Medent repair them.

CHALLENGES FACED BY USERS	FREQUENCY
Navigations in EMR is complex	5
Number of clicks is too many	10
Time-consuming	12
Lack of software and hardware tools	38
Lack of features in EMR	15
Not enough training	30

Table 5: Type of difficulties faced by users while capturing data in EMR

“All participants indicated that despite the challenges with EMR use, they prefer using the EMR than paper-based records; they also indicated that EMR is **worth the time, effort and investment but on the other side time-consuming in EMR is one of the major difficulties faced by users while capturing the data.** One of the common reason’s respondents gave that there **is a lack of some features in EMR** for both the purpose i.e. Patient care and Clinical research. Users still facing the human resource challenges in the health sector, there is a need for an efficient, more detailed way of collecting data in EMR.

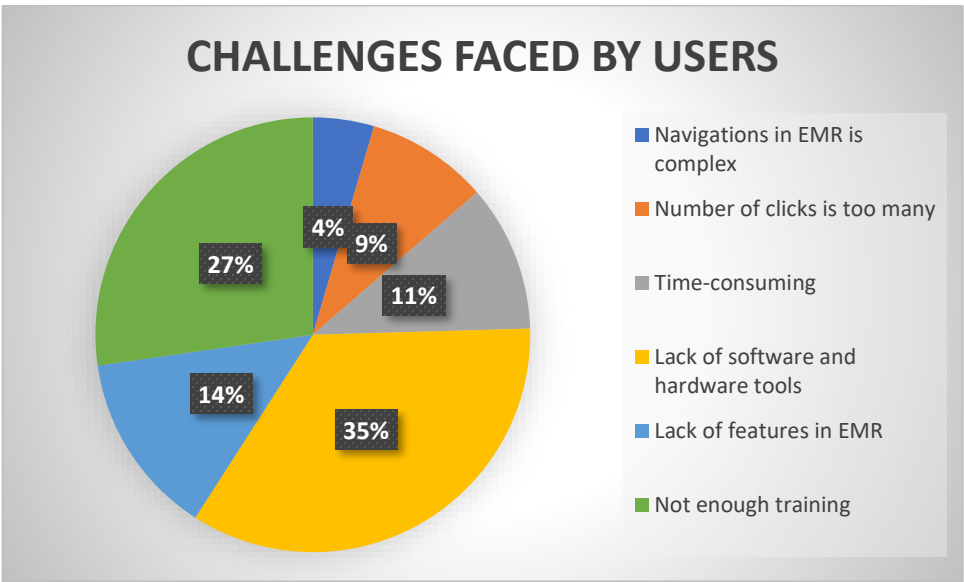


Figure 4: Type of difficulties faced by the user while capturing data in EMR

TIME USER FACING DIFFICULTIES:

How many time Users faced difficulties	Frequency
Once's or more in a day	12
Once in a week	18
Once in a Month	30
Once in a year	50

Table 6: Time of users facing challenges

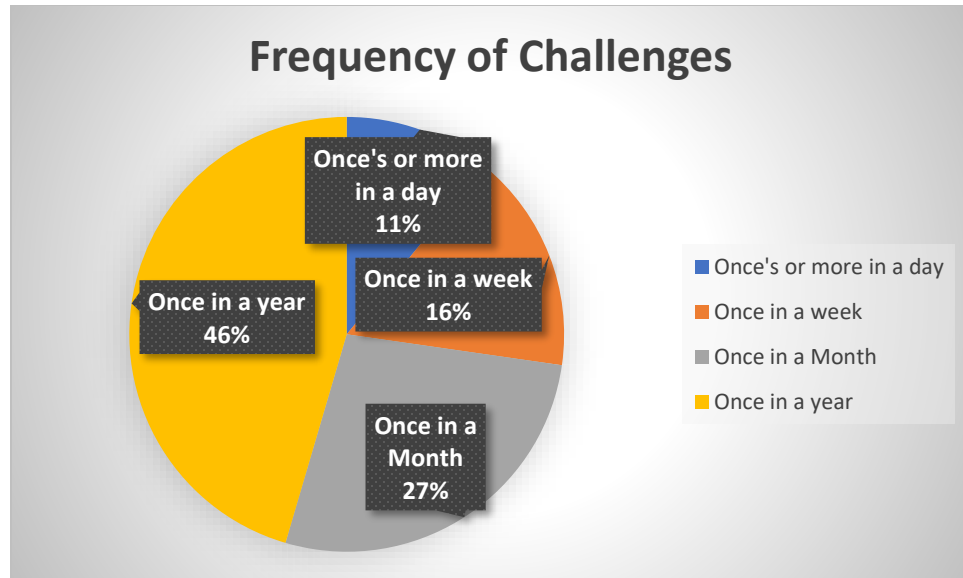


Figure 5: Frequency of Challenges

The study also revealed participants had been faced difficulties once in a day(12) while capturing the data which is Negligible.

INFLUENCING FACTR FOR USING EMR

Ranking	No Response	Poor	Good	Very Good	Excellent	Average
Statistical Used	0	6	25	85	84	4.2
Easy access to EMR	1	4	20	80	95	4.3
Better Decision making	1	9	45	70	75	4
Enforce Process	0	0	25	83	92	4.4
Paperless	8	8	12	82	90	4.1

Table 7: Influencing factor for using EMR

There were mixed responses on encouragement on specific functions of the EMR and as summarized in Table 7. All five who indicated that **EMR provides good quality for capturing the data for patient care and clinical research**. Their main reason was that the EMR only helps to enforce the process, which helps to easily understand the patient information and give a more structured view for collecting and analysing the patient information. A second **major reason to encourage predefined conditions that users**

(especially clinicians and data operator) it is paperless the main advantage of using the EMR users don't have to carry paper every time.

The other reason given was that with paper-based records clinicians and nurses can write all patients' details like history, physical examination findings, and diagnosis which more easily be collected by the EMR. participants found information in the **EMR more secure than in paper-based records because EMR is user protected using username and password**. The study also says that the research is very happy with the EMR because it gives **better decision making and statically used**.

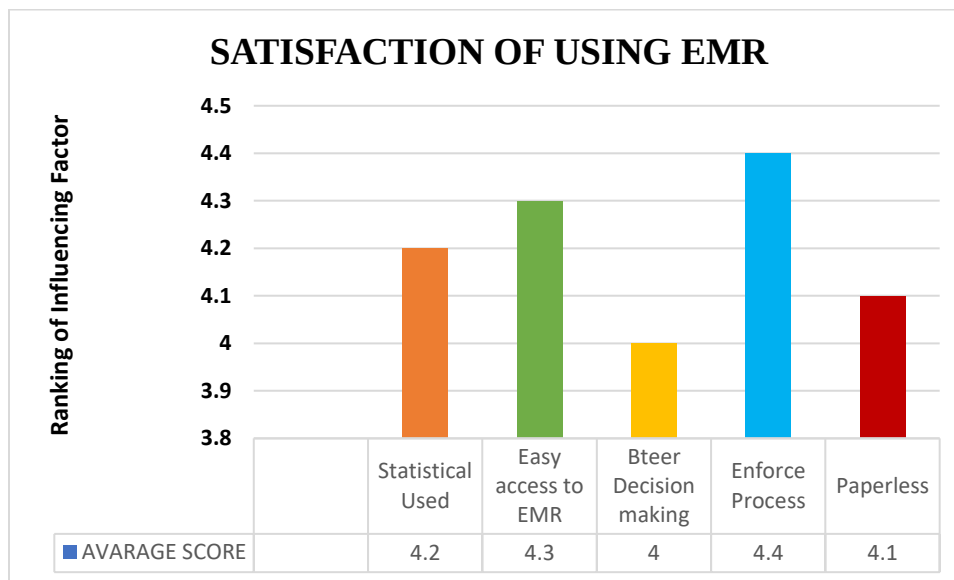


Figure 6 : Satisfaction using EMR

The other reason given was that with paper-based records clinicians and nurses can write all patients' details like history, physical examination findings, and diagnosis which more easily be collected by the EMR. participants found information in the **EMR more secure than in paper-based records because EMR is user protected using username and password**. The study also says that the research is very happy with the EMR because it gives **better decision making and statically used**.

SUMMARY OF THE RESULTS

PROCESS BASED:

- 95 % of Users responded overwhelmingly about EMR being accurate in information, presentable and readable to use
- 97% indicated that the EMR has maintaining the confidentiality of patient information

CHALLENGE BASED:

- 55% of participants were experience problems while capturing data in EMR.
- The most common problems experienced:
 1. Lack of software support and hardware equipment
 2. Not enough training providing to users.
- Their main benefits to use of EMR:
 1. Helps to enforce the process
 2. users (especially clinicians and data operator) was that it is paperless

CHAPTER 5

DISCUSSION

INTRODUCTION

- One of the key targets of this project is to make available in health care settings the benefits of new technologies, especially information and communications technologies, in cooperation with the private sector.
- There has already been rapid progress in bridging the gap on the mobile phone sector, but large gaps and challenges remain in improving access to key technologies that are essential to increase productivity, sustain economic growth and improve service delivery in areas like health and education.
- The introduction of the EMR in the health care system in Medent is one of the ways towards the attainment of this project but also a way of improving service delivery in health service delivery in the face of increasing patients' demands and a critical shortage of human and material resources.

CHAPTER 6

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSION

Easy use of EMR

This study evaluated the gratification, difficulties, and encouragement for data capturing in EMR users in Medent. General, though there are challenges with EMR use, most users were satisfied with the EMR for patient care and clinical research. The study has also found that users feel that quality of care has meaningfully improved with the outline of the EMR system and that patient waiting time at the clinic has greatly reduced. It has also been learned from this study that with the outline of the EMR, users can capture the data with the system with solving the user's problems within a short time (less than a day, some in a few minutes), effort and resources to capturing the data take less time.

Difference in approach

The study also observed that users felt that there is no recognized technology for possible users of the EMR system but deliberations with Medent team designated that the Topographies and new technology is available and kept being efficient as experiences appeared hence the differences in the solving method at different sites. These different replies on the difficulties clearly reflect a policy-practice gap / intention-do gap that wants to be addressed.

A simple and effective electronic data system can be recognized and adopted in a emerging city like Nagpur. The key though to its ultimate usefulness and success is a provision of proper and adequate training for all users for sustainability. The EMR is used to front-runner care and improve enduring outcomes. It can also be used as a research tool. In the context of competing needs for health resources, the extent to which assistances of the EMR scheme can be maximized and documented from results in these pilot regions might be a key factor in attracting further investment in the system. It is, therefore, vital that the current momentum is sustained with worthwhile improvements made.

RECOMMENDATIONS

The following recommendations are warranted in order to attain full potential benefits from t
Process Based:

- EMR system make centrally retrieving so that anyone can access and imprisonment data from anyplace.
- There is a need to upgrade the EMR if possible, so it can give feedback on what has happened to patients referred.

Challenge Based :

- Finding shows that 27% healthcare provider not having enough training so it will be suggested that Electronic Training (E- Training) and Classroom training given to the staff.
- Most of the user faced challenges while capturing data in EMR is lack of software and hardware tool so Medent should provide backup plan for replacing this issue at least one IT person always available in hospital to resolve such type of issue.
- One of the problems faced by user is time consuming for capturing the data so the data should not be in TEXT based it must be in TAGS or KEYWORDS form so that user can easily find out what they want to search. Data in Tags can be extracted and sliced or diced easily compared to data captured in free flow format.
- EMR system designed in such a way that it has multiple encountered access point rather than single encountered access point, so it is very easy to user for capturing data.
- 14% of healthcare provider faced challenges because of lack of features in EMR so EMR structure should be open ended type (more objective in nature) so that it would not take more time to fill the patient information , which helps to easily understand the patient information and give the more structured view for collecting and analysing the patient information.

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36-40 yrs ☐

Over 41 yrs ☐

3. What is your profession?

Nurse ☐

Clinician ☐

Pharmacy technician ☐

Data entry clerk ☐

Other ☐ Specify.....

3. How long have you worked in this Hospital?

Less than 6 months ☐

6-12 months ☐

13-18 months ☐

19-24 months

☐

Above 24 months

☐

USE OF ELECTRONIC MEDICAL RECORDS FOR PATIENT CARE AND CLINICAL RESEARCH

1. Have you used electronic medical records?

Yes

☐

No

☐

2. If yes, for how long have you been used electronic medical records?

Less than 6 months

☐

6-12 months

☐

13-18 months

☐

19-24 months

☐

Above 24 months

☐

3. Do you think patient Medical Information is more accurate / Readably /Presentable in EMR?

Yes

☐

No

☐

4. Do you think EMR maintain the confidentiality of Patient Medical Information?

Yes

☐

No

☐

5. Do you faced any difficulties while capturing Data in EMR?

Yes

☐

No

☐

6. If Yes, which type of difficulties you faced while capturing Data in EMR?

Navigations in EMR is complex

☐

Number of clicks are too many

☐

Time consuming

☐

Lack of equipment and hardware

☐

Lack of Features in EMR

☐

Not enough training

☐

7. How many times you faced difficulties while capturing the Patient Information?

Once's or more in a day

☐

Once in a week

☐

Once in a Month

☐

Once in a Year

☐

8. Do these difficulties discourage you from using EMR?

Always

☐

Sometimes

☐

Rarely

☐

Never

☐

9. Give the ranking to below options what encourages you for using EMR?

Statistical Used	1	2	3	4	5
Easy access of EMR	1	2	3	4	5
Better Decision making	1	2	3	4	5
Maintain Compliances/ Regulatory	1	2	3	4	5
Enforce Process	1	2	3	4	5
Paperless	1	2	3	4	5

10. Do you think use of EMR on wireless technology is Significant benefits in using?

Yes	☐
No	☐

11. Based on your experience which approach you select during capturing data for clinical research?

More detailed flow through	☐
Accessing to data clean	☐
Patient tracking	☐
Data Trackin	☐