

Clinical Service User Perception of EMR System at Narayana Health

By

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The Candidate has successfully carried out the study designated to him during internship training and his 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 his future endeavors.



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This is to certify that Mr. Neelak Mukherjee, has completed his dissertation program in **CLINICAL SERVICE USER PERCEPTION OF EMR SYSTEM** at Narayana Health, Bangalore from 08th February 2016 to 07th May 2016.

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CLINICAL SERVICE USER PERCEPTION OF EMR SYSTEM AT NARAYANA HEALTH

Acronyms

OPD- Out Patient Department

EMR- Electronic Medical Records

CPOE- Computerized physician order entry

HIS- Hospital information system

MCIT- Ministry of Communications and Information Technology

UMLS- Unified Medical Language System

PC- Personal Computer

AMRS- AMPATH Medical Record System

HITECH - The Health Information Technology for Economic and Clinical Health Act

EHR- Electronic Health Records

PIH- Partners in Health

UPS- Uninterruptable Power Supply

IMEA- India, Middle East and Africa

SNOMED- The Systematized Nomenclature of Medicine

ICD- International Classification of Diseases

NH- Narayana Health

ONC- Office of the National Coordinator for Health Information Technology

ERP- Enterprise Resource Planning

**CLINICAL SERVICE USER PERCEPTION OF EMR SYSTEM AT
NARAYANA HEALTH**

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ABSTRACT

INTRODUCTION: Narayana Health along with ICT Health LLC has begun implementing electronic medical record framework for dealing with the consultation and treatment of OPD patients.

METHODOLOGY: This was an assessment study that utilized quantitative study strategy. Information was gathered from two deliberately chosen healing centres out of eight facilities utilizing Electronic Medical Records (EMR) in OPD discussions. Quantitative information is investigated utilizing MS-Excel.

OBJECTIVE: The principle target of this study is to assess the clinical user's recognition on the viability & productivity, satisfaction, challenges and training of consultants using Electronic Medical Records system in Narayana Health.

RESULTS: The study findings showed that users preferred using the EMR than paper based records and that overall, found it faster and easier to fill. There was also increase in user satisfaction and quality of care given to patients. However there was also an increase in consultation and patient waiting time. The increase in consultation and patient waiting time is contrary to the benefits of an EMR system. This had to be investigated and a solution had to be reached. The study results also indicated that the training conducted to prepare potential users of EMR was not well structured though the support given after the training was adequate.

CONCLUSION: It is clear from the study that users found the system more viable and productive. However a better training regimen is required to overcome the increase in consultation and patient waiting time.

CHAPTER 1

INTRODUCTION

Doctors are relied upon to record experiences they have with patients to guarantee critical data for decision making is recorded and the action taken are additionally recorded. Documentation is additionally required as a chronicled record of what happened in instances of Medico legal cases. As it were, doctors dislike the errand of documentation, as it takes away from their essential assignment: dealing with patients. Doctors additionally hate the duplication of exertion required with documentation, as each drug that is prescribed, each lab test requested, each x-ray requested must be re-composed in the case sheet to keep up a decent record. Correspondence between professionals is troublesome as by and large the data gathered is divided, much of the time repetitive and voluminous. Communication between practitioners is also difficult as data is often divided, much of the time repetitive and bulky..... [1]

Electronic medical record (EMR) systems, defined as "an electronic record of health-related information on an individual that can be created, gathered, managed, and consulted by authorized clinicians and staff within one health care organization,"..... [2] The information recorded are patient's demographics, progress notes, problem list, medications, vital signs, current and past medical history, family history, immunizations, laboratory data and radiology reports.

Big corporate hospitals who have implemented EMR systems have already started to reap the benefits of the same. Long term collection of clinical data at the point of care enhances the efficiency and improves the data quality. EMR also leads to streamlining of processes leading to cutting of costs. However the most compelling reason to shift to EMR based system is that once the information gets in the system it gets stored forever. This data can't be lost or misplaced like paper based system and it can be accessed from anywhere in the world through web based applications if required. The same records can be used when the patients move from one healthcare facility to another.

1.1 Problem statement

Despite enormous investment world-wide in computerized health information systems their overall benefits and costs have been rarely fully assessed and evaluated. Although beneficial EMR adoption rates has been very low in India. There are several reasons for the same.

- Low awareness amongst health care providers and seekers.
- Resistance to accepting EMR by doctors.
- High capital required for implementation.
- Negative influence on existing workflow during implementation phase.
- EMR systems being inadequate to capture all the data collected by doctors.
- Complicated user interface.
- Lack of customized EMR system for Indian markets leading to systems with gaps.
- Data security issues.

Narayana Health is rolling out EMR to more high patient volume centres without assessing its viability in settings where it is at present executed, how useful users find EMR and whether the preparation users get before they begin using the EMR is sufficient or not.

1.2 Purpose of study:

The purpose of this study was to evaluate user's perspective on the adequacy, productivity and fulfilment of the EMR system introduced by Narayana Health at its centres.

1.3 Specific objectives:

- To evaluate user's observation on the viability and productivity of EMR in contrast with paper based records.
- To investigate user's satisfaction on the advantages and difficulties on utilizing the electronic medical records.
- To recognize and assess training gaps and training requirements for users before they begin using EMR.

1.4 Significance of study:

Since Narayana Health started implementing EMR in India sometime ago, no study has been done to evaluate whether the system meets its intended goals or not ,how useful users find EMR and whether the training users get before they start using the EMR is enough or not.

This study was conducted to address these questions from Narayana Health.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction:

An EMR is designed to improve and enhance the capability of a care provider to document observations and findings and to provide more information on treatment of persons in his or her care. The data can range from medical history, allergies to drugs, prescriptions, lab and imaging reports to the patient's bills and insurance data. The system also enables the doctors to make informed and correct decision with ease. EMR along with HIS helps service provider to create, maintain and retrieve patient's medical information.[3]

Although there are several advantages of implementing EMR, the penetration of such systems in some form has been . Some hospitals that have moved on to digital records are mainly private corporate hospitals, some trust-run hospitals like SGRH, Delhi; AIMS, Kochi; and few state government hospitals on funding from State Health Projects.[4]

Government of India has intended to introduce a uniform system for maintenance of Electronic Medical Records / Electronic Health Records (EMR / EHR) by the Hospitals and healthcare providers in the country. Back in 2003 MCIT was tasked to come up with a framework for health IT architecture along with guidelines and standards. An EMR Standards Committee set up by Ministry of Health and Family Welfare in September 2010, and the present guidelines are a result of this committee.[5]

2.2 History of EMR:

The thought of recording patient data electronically rather than on paper –the Electronic Medical Record (EMR) –has been around since the late 1960's, when Larry Weed presented the idea of the Problem Oriented Medical Record into restorative practice.[6]

Until then, specialist's normally recorded just their findings and the treatment they gave. Weed's advancement was to create a record that would permit an outsider to freely check the analysis. In 1972, the Regenstreif Institute built up the first electronic medical

records framework. In spite of the fact that the idea was broadly hailed as a noteworthy development in restorative practice, doctors did not run to the technology....[7]

In 1991, the Institute of Medicine, a profoundly regarded research organization in the US suggested that by the year 2000, each doctor ought to be utilizing PCs as a part of their practice to enhance quiet care and made strategy proposals on the most proficient method to accomplish that.....[8]

2.3 Challenges of EMR:

The EMR raises issues of , privacy and security [9,10]. Progresses in data innovation, the need to cut expenses of medicinal services conveyance, and customer requests for more successful and better-quality consideration have all rushed the investigation of options for storage and retrieval of patient data, but then the usage of EMR countenances a few technical difficulties. Contrasted with different commercial ventures, the acknowledgment of data innovation in medicinal services has been moderate [11,12]. Aggravating this is the restricted experience accessible in sending applications, which has brought about a more extreme expectation to absorb information for social insurance associations.

A more noteworthy issue with EMR frameworks is the absence of models to exchange data. While various models exist to transmit unadulterated information, for example, diagnosis codes, test results, and billing data, there is still no consensus in areas for example, patient signs and side effects, radiology and other test results, and method codes. Albeit some partner the National Library of Medicine's Unified Medical Language System (UMLS) with an exhaustive clinical vocabulary, its objective is substantially more humble, to serve pretty much as a meta-thesaurus connecting terms crosswise over various wording frameworks [13].

2.4 Use of EMR in Developed Countries

Nations, for example, the United States, United Kingdom and Australia have develop and propelled medicinal services frameworks that get significant subsidizing and backing from their legislatures. Albeit critical disappointments still exist in these

frameworks, there is solid backing and inspiration to finish objectives connected with thorough advancement of fruitful restorative data innovation frameworks...[14]

These nations can make critical interests in exploration to create data frameworks that would address the issue of their specific human services framework. This is in sharp complexity to the social insurance framework of numerous creating nations. For huge numbers of these nations the conveyance and administration of medicinal services benefits alone accompanies numerous difficulties. In a hefty portion of these nations, implementers of human services data innovation based arrangements are confronted with complex difficulties, for example, deficient subsidizing, absence of assets and feeble social insurance framework. At the point when EMR frameworks were initially presented, it was generally trusted that their expansive reception will prompt significant medicinal services reserve funds, decrease restorative mistakes, and enhance wellbeing [15]

The United States trails a number of other countries in the use of EMR systems. However there has been a phenomenal increase in adoption of EMR systems since the passing of the HITECH Act of 2009. EHR adoption rates increased from only 2 states reporting rates higher than 20% to all states reporting rates 50% or higher by 2014. Furthermore, only 2 states currently have adoption rates below 60%.....[16]

In comparison countries like UK and Australia have nearly universal adoption of EMR systems.[15]

2.5 Use of EMR in developing countries

EMR have great potential to transform healthcare delivery in developing nations. These systems could better utilize limited resources and reach out to more patients. EMR has been implemented in several developing countries with phenomenal success in some cases.

In Kenya in 2001, the Mosoriot Medical Record System (MMRS) was introduced. The project was later changed to AMRS. The framework serves 60,000 patients, and runs Microsoft Access on two arranged PCs. These are powered by a UPS and along with a sun based battery. Patients register in the framework on their visit to the centre and go through the facility with a paper visit structure. In correlation with the centre prior and

then afterward the framework was actualized, there were incredible enhancements. Patients visits were 22% shorter, provider time per patient was diminished by 58%, patients invested 38% less time waiting in the center, facility faculty invested half less time interacting with patients, 67% less time interacting with each other, and additional time in individual exercises. The drawback is that clerks must perform the registration and translate visit information, which is inclined to mistakes [17].

In 1996, Partners In Health began an open source web framework in Peru that was supported by an Oracle database. The framework serves 4300 patients. Doctors fill out forms, and nurses and their assistants enter prescription information. The drug request section framework has indicated 17.4% less blunders than the past paper approach. This EMR exhibits the quality and adaptability of a web based approach. In any case, obviously this requires a solid web connection [17]. In 1999, PIH started an EMR framework in parts of country Haiti. These provincial regions have essentially no streets, power, or phone administration. This design serves 4000 patients and is the same plan that was built up in Peru aside except with an additional offline client for data entry and review. This offline component helped overcome unreliable internet communications. When the network is down, the offline component still allows data entry and case viewing. This framework shows how EMR frameworks can overcome incredible difficulties in remote zones with essentially no foundation and constrained specialized mastery.

Other EMR frameworks incorporate a Careware framework in Uganda that is a stand-alone database worked with Microsoft Access and an EMR in Malawi that is a touch screen understanding administration data framework. The drawback of the framework in Malawi is that it is hard to enter free content with the utilization of touch screens [17].

2.6 Introduction of EMR at Narayana Health.

Narayana Health

Narayana Health was founded in the year 2000 under the aegis of Asian Heart Foundation by Dr. Devi Prasad Shetty. It started as a 280 bedded hospital which has grown to 23 hospitals, 8 heart centres and 25 primary health centres in 18 cities across the country and 1 hospital in the Cayman Island with total operational bed strength of 5600 beds with a potential to reach 6500 beds.

ICT Health

ICT Health is one of the main, integrated clinical-innovation organizations, working over the IMEA district (India, Middle-East, and Africa). More than a hundred healthcare services providers have used their experience of almost three decades, and benefited of administrations from their locally based technology and consulting experts. ICT Health's HINAI platform provides comprehensive functionality encompassing patient administration, electronic health record, clinical support services including Pharmacy, Diagnostic and Imaging services as well as Revenue Cycle management. It also offers end-to-end answers for the healthcare services domain including Information Systems related to Electronic Health Records, Healthcare ERP, Clinical automation and medical device technology, IT Infrastructure and Managed Services, and outsourced clinical administrations including doctor's facility administration and quality accreditation.

HINAI is an enterprise class, next gen platform, designed for the cloud. It incorporates all the current interoperability, security and privacy guidelines. HINAI is certified as a Complete EHR as per ONC 2014 standards.

The core of Narayana Health's approach is the application of easy-to-use EMR system clinical workstations at the point of patient care. This system efficiently and accurately guides healthcare workers through the diagnosis and treatment of patients following ICD 10 and SNOMED classification. The system also captures timely and accurate data that is used by healthcare workers during patient visits to supplement decision making. The consultants through the CPOE system can order tests (laboratory & radiological)

as well as prescribe medications. Along with this is clinical decision support system integrated in the EMR framework.

Clinical Decision Support (CDS) is a process designed to aid directly in clinical decision making, in which characteristics of individual patients are used to generate patient specific interventions, assessments, recommendations, or other forms of guidance that are then presented to a decision making recipient or recipients that can include clinicians, patients, and others involved in care delivery. (Osheroff, 2012; Bright, Wong, Dhurjati et al, 2012; Kawamoto, Houlihan, Balas et al, 2005). It represents one of the most promising tools to mitigate the ever-increasing complexity of the day-to-day care practice of medicine. When implemented successfully, CDS can assure that all patients in a practice receive appropriate and timely preventive services. The effective use of a clinical decision support system means patients get the right tests, the right medications, and the right treatment, particularly for chronic conditions.

CHAPTER 3

METHODOLOGY

3.1 Type of study:

This was a cross sectional evaluation research study.

3.2 Study place, population and sampling:

This study used stratified random sampling to get study participants.

At present there are eight centres utilizing EMR framework as a part of OPD consultations. Out of the eight, EMR was implemented in five centres amid the dissertation period. Out of the five centres two were selected NH Multispecialty Hospital, Barasat and NH Superspecialty Hospital, Howrah; for the study.

There are 147 consultants at NH Howrah and 81 consultants at NH Barasat which gives a total population of (N=228). For 90 % C.I and 10 % margin of error the recommended sample size is 53. 54 respondents out of 228 randomly selected. Of the 54 respondents 38 responded that they were using the system since it was implemented.

The study took three months to complete from synopsis submission, initial implementation , usage, data collection analysis and report generation.

3.3 Data collection:

Data was collected through anonymous self administered questionnaire. The questionnaire was distributed to the doctors a month after EMR was implemented at these sites. All the respondents had used the EMR system for at least a week before the survey.

3.4 Data analysis:

Data was analyzed utilizing the Microsoft Excel. Information was entered physically into the product application from the questionnaire and investigated. Diagrams and graphs were also made utilizing Microsoft Excel.

3.5 Study limitations:

- Being a very new technology the adoption of the system is low, hence the limited sample size and made it difficult to sample the study participants.
- The second limitation is that the centres being high volume centres it was difficult to interact much with the consultants during their consultation time.
- The third limitation was two centres in the east were selected for the study; consultants might have a different experience and view of the system in other parts of the country.
- The fourth limitation was time, as the study was supposed to be completed within a given time frame; as such the study was done only after a month post go live. The findings could have been different as doctors get used to the system overtime.

3.6 Ethical consideration:

Verbal consent was taken for the study.

Written consent was not taken as the information collected was not mentally or psychologically "intrusive" and did not include members' private, individual, personal biographies, and encounters.

CHAPTER 4

RESULTS

4.1 Description of participants

The study had 38 participants who gave their consent for this survey. Participants (consultants) differed according to their speciality, experience, length of EMR use and were from two centres (Howrah and Barasat). The study had 31 (82%) male participants and 7 (18%) female participants.

	Age of users
Less than 30 years	1 (2%)
31 to 40 years	20 (53%)
41 and above	17 (45%)
Total	38

Table 4.1

4.2 Experience of users with EMR

Participants in the study had different experiences on the EMR use; some had used the system longer than others. 27 (71%) of the respondents had used the system for more than two weeks and are quite conversant with the system.

	Period worked with EMR
Less than 7 days	2 (5 %)
8 to 14 days	9 (24%)
15 to 21 days	22(58%)
Above 22 days	5(13%)
Total	38 (100%)

Table 4.2

4.3 Viability and productivity of EMR

The findings were subjective from the participants. This study used user's discernment to evaluate its viability and productivity. EMR viability in this study is characterized as the degree to which clients felt the EMR could enhance patient care and increase ease of use.

EMR productivity is the capacity of the EMR to create fast consultations; this included exactness, amplexness, convenience, ease of use.

4.3.1 EMR perceived as faster and easier to complete

Of the 38 respondents 22 (58 %) have found the system faster and easier than paper based consultation. 11 (29%) respondents have found paper based system more favourable. Only 5 (13%) of the respondents found no difference between both system. This should improve as the consultants use the system more. There is preference of paper based consultation as the doctors have been using that for most of their professional life.

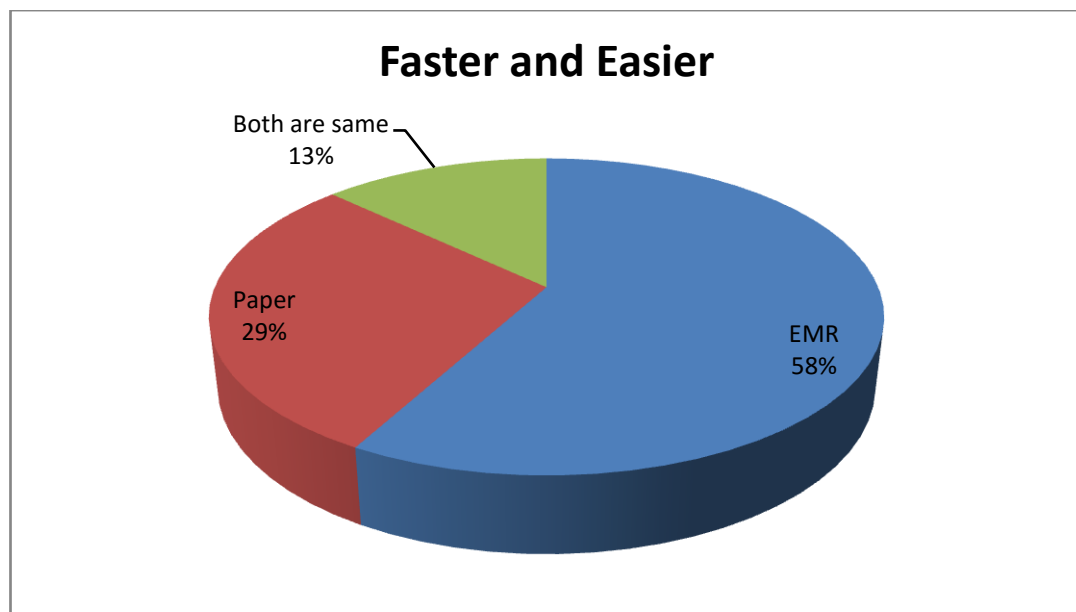


Figure 4.1

4.3.2 Quality of care

In this study it was found that half of all the users have reported improvement on the quality of care provided to the patients. 13 (34%) reported that quality of care has improved a little while 6 (16%) have said that quality of care has improved significantly. 17 (44%) have found no change in quality of care. This could be attributed to the fact that since it is a new system the users have not been being able to utilize the system to the fullest.

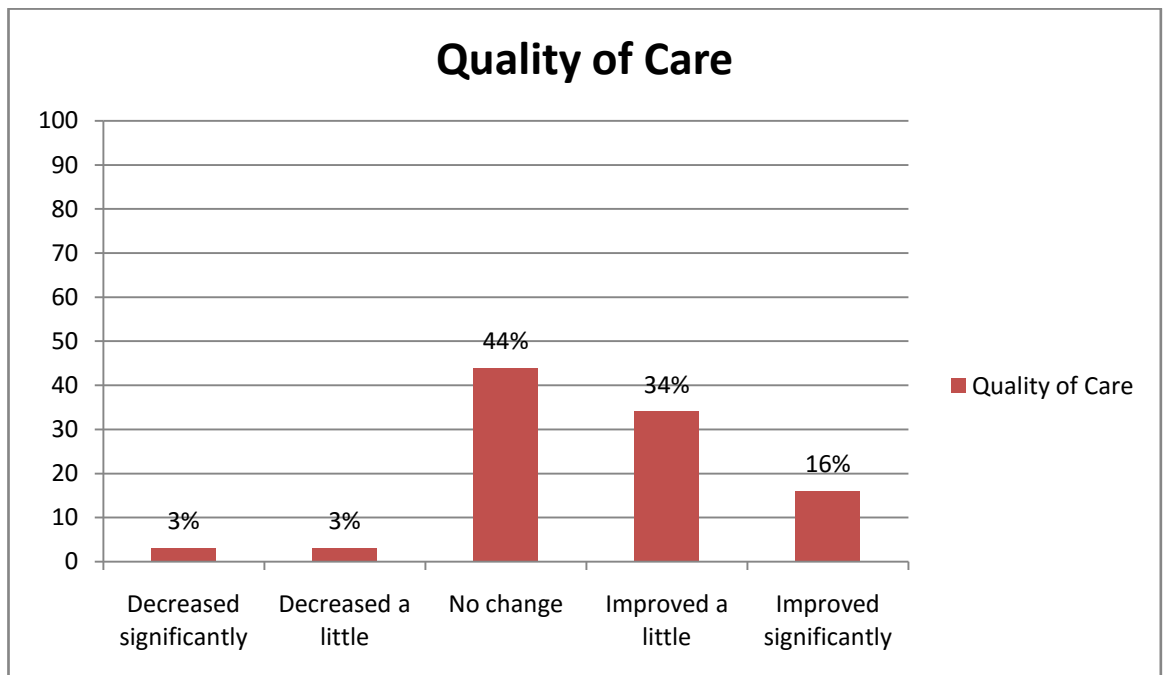


Figure 4.2

4.4 User satisfaction and challenges of using EMR

In this section we clubbed together the findings on user satisfaction as well as challenges faced by users on a daily usage basis.

4.4.1 User satisfaction

There was mixed response when it came to user satisfaction on specific function of the EMR. 11(29%) of the respondents felt that paper form was more accurate. Their main reason was that the EMR only has very few predefined conditions that users (especially clinicians) need to tick but most conditions are not included in the EMR but could very easily be written down on paper based records. An overwhelming 28 (74%) of the users found patient data was safer in EMR. The results are summarized in the table below.

	Accuracy of data	Data safer (privacy)
EMR	19 (50%)	28 (74%)
Paper Form	11 (29%)	1 (3%)
Both are same	8 (21%)	9 (23 %)
Total	38 (100%)	38 (100%)

Table 4.3

There was also mixed response when it came to overall satisfaction with the EMR system. 5 (13%) of the respondents reported that they were fully satisfied, 23 (60%) said that they were mostly (rather; a little) satisfied. The findings are summarized below.

CLINICAL SERVICE USER PERCEPTION OF EMR SYSTEM AT NARAYANA HEALTH

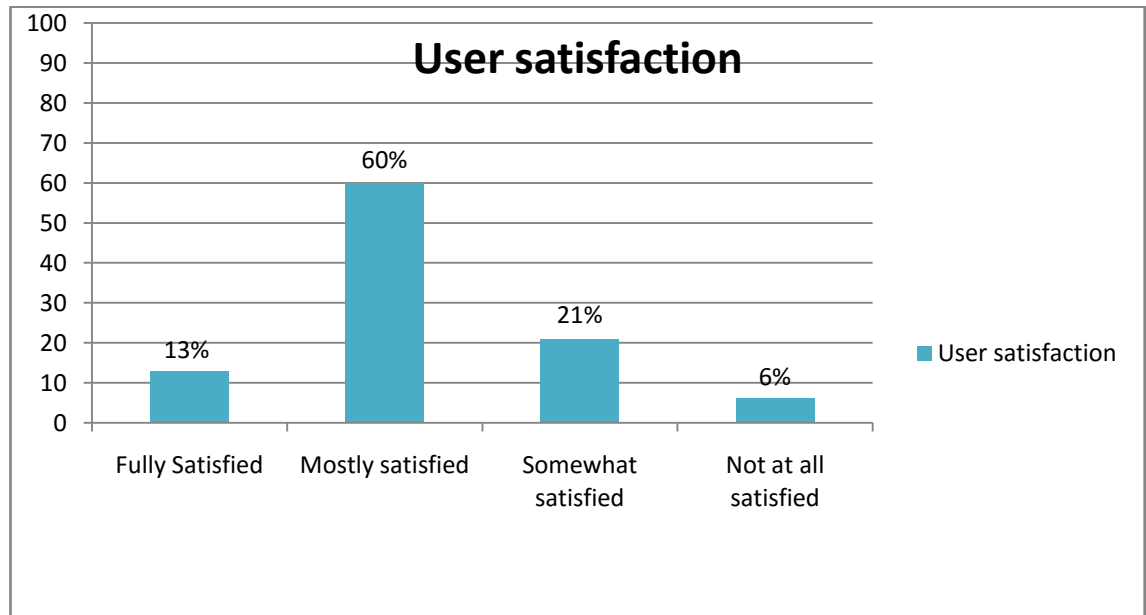


Figure 4.3

4.4.2 Challenges users face while using the EMR

From the survey it was found that doctors faced problems mainly during entering patient data and while giving a consultation print out to the patients. Around 27 (71%) consultants have sometimes faced problem while entering patient data. About 11 (29%) of respondents only have rarely or never faced problems with inputting data. Regarding giving printouts, 13 (34%) have sometimes encountered problems. 25 (66%) of the respondents have never or rarely faced problems while giving consultation summaries.

We could observe that 50 % (19) of the respondents found no difference in consultation time when comparing paper based to EMR based consultation. 15 (39 %) of the respondents took more time while using EMR and only 4 (11%) found the EMR based consultations faster than paper based one. A majority of respondents 20 (53%) found that there is an increase of waiting time for the patients. 15 (39%) found no change and 3 (8%) found a decrease in waiting time for patients.

CLINICAL SERVICE USER PERCEPTION OF EMR SYSTEM AT NARAYANA HEALTH

	Duration of Consultation	Waiting time of patients
Shorter	4 (11%)	3 (8%)
Same	19 (50%)	15 (39%)
Longer	15 (39%)	20 (53%)
Total	38 (100%)	38 (100%)

Table 4.4

It can be seen that the average time in consultation and patient waiting time has gone up according to the data. This could be because of the fact that this being a new system doctors need some more time to get used to the system and actually make the time lesser.

Even with the issues an overwhelming number of respondents 35 (92%) feel that EMR is worth the time and effort.

4.5 Training of users

The training was conducted by NH EMR department. The doctors were either individually trained by hands on demonstration as well as some of them were trained as a group in a classroom environment. After training, hands on support were provided to the consultants during live consultations.

About 33(87%) of the consultants were trained by the dedicated NH EMR department while the rest 5 (13%) was trained by other staff e,g IT . No doctor was left out of the training program.

Post go live support was provided to all the users with about 29 (76%) saying that they received full support from NH EMR department.

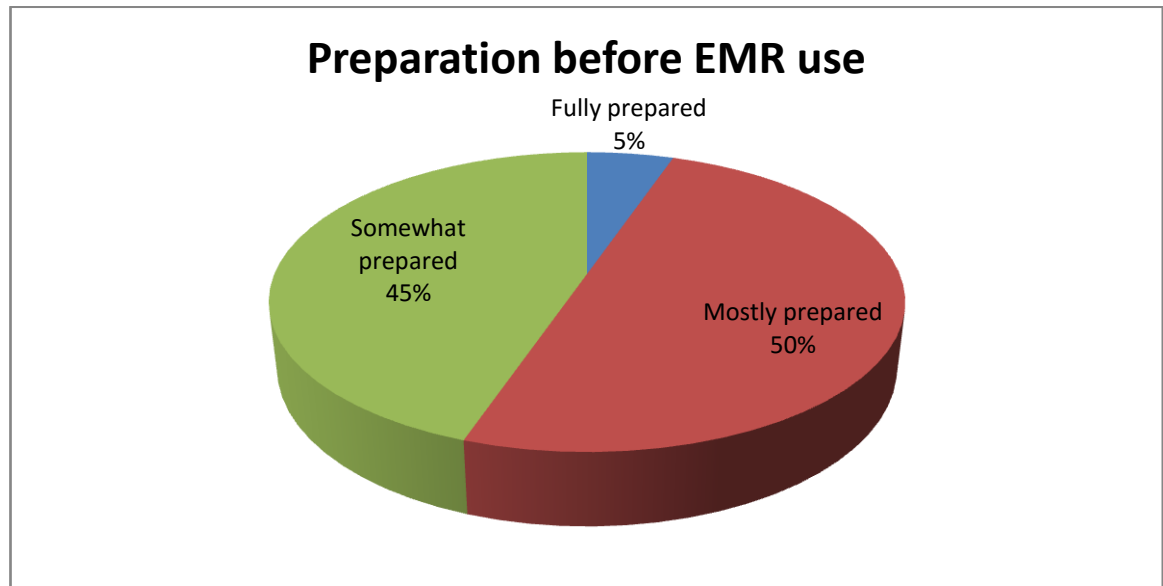


Figure 4.4

CHAPTER 5

DISCUSSIONS

5.1 Introduction:

This chapter discusses the findings of the be taught in terms of the reviewed literature and the NH procedure context. The order of the discussion is as follows: firstly, users' perception on effectiveness and efficiency of EMR in assessment to paper files at NH in evaluation with documented knowledge from elsewhere. Secondly, customers' notion of the satisfaction and challenges of utilizing EMR in their clinics and experiences on EMR use are discussed. Thirdly, the form of the training supplied to users before they start using EMR and the sort of aid users got after the learning and what has been documented because the best training and support necessary for advantage EMR customers.

5.2 Productivity and viability

Findings on user's observation on the viability and productivity of EMR obviously show that clients felt that the EMR is more compelling and more effective contrasted with paper based records. Freeman et.al in their patient and user satisfaction review led in a neurological centre claim to have recorded that healthcare computerization is advanced on the premise of its various advantages. It spares time, enhances record keeping, builds precision, enhances flow of data, enhances the nature of clinical information accessible, and lessens paperwork [18].

Another study by Kaplan in 2001 also indicated that the introduction of Electronic Medical Records in a health care system helped to achieve productivity mainly through the elimination of routine tasks, such as browsing through paper-based charts, flipping through numerous files and papers to get patients' medical and drug history [32]. This is similar to some of the reasons cited by users in this study in support of the efficiency benefits of EMR.

5.3 User satisfaction and challenges

Studies have demonstrated that selection of electronic medical record frameworks can help in major healthcare savings, cut down on medical mistakes, and enhance health care delivery [19].

Notifications on medication interactions, reminders and cautions on patient with a low Body Mass Index subsequent to having their weight entered in the EMR, visual alerts for low vitals, tests results that are out of range, calculate no of pills, ability to view radiology and lab reports were some of the factors that users credited as having assumed a noteworthy part in the change of nature of patients' care from this study and a key advantage of the EMR.

5.4 Training of users

There have been rarely any studies on what the ideal training period should be for potential EMR users. There is no literature that has stipulated guidelines or procedure regarding the same. The training for the users at the two sites was different. The training did not encompass the previous exposure or experience to computers. Knowing the potential user's basic computer proficiency would help trainers to estimate the time and effort required to put into the training to make sure the consultants are well prepared to adopt and use the system.

It is important to provide users with a short overview, give them the life-size picture and some details about the most often used features, and let them play with the system. Evidence has shown that the greater sense of comfort a user can develop with the system and the various user interface screens before the formal training session begin the more effective that training will be. A well-defined and clear training curriculum with well-defined and realistic time frame is therefore crucial to successful implementation of any EMR system being introduced to health care providers.

EMR customers require gigantic quantities of help, primarily within the early phases after training and implementation. Sanchez et al discovered that a myriad questions and problems come up quickly after the EMR training; some trivial and others monstrous, but all can result in disenchantment and disillusionment if not handled thoroughly. They discovered that a concern as simple as users forgetting their password and not being

CLINICAL SERVICE USER PERCEPTION OF EMR SYSTEM AT NARAYANA HEALTH

capable to unravel it could actually swiftly make the whole system unusable for a few individuals [20]. It was very pleasing to learn from our study that in all the two sites there has been enough support given to all users soon after the training and in the early stages of EMR implementation.

CHAPTER 6

CONCLUSION AND RECOMMENDATIONS

6.1 Conclusion

This study evaluated the productivity, viability, satisfaction, challenges and training of EMR users in NH. Although there are several issues, the majority of the respondents were satisfied with EMR and indicated that they would prefer EMR over paper based record. The study also indicated that the consultants found that there was an improvement of quality of care after introduction of EMR.

The challenges that were faced by the consultants were mainly data entry related issues which will disappear overtime with practice. This is probably the reason for increased consultation and patient waiting time. The print out related issues can be attributed to printers not working at times and it is difficult to continue working without a printer.

The study also established that though training was thoroughly provided there was no established training curriculum. There was no training or user manual for the users published from either ICT Health or Narayana Health. The consultants were also trained during live consultations as they were busy other time. The setting for such training is not conducive for knowledge retention. No tests was conducted post training to check the consultant's level of learning. The lack of a training regimen clearly shows a policy-practice gap which needs to be addressed immediately.

The key here to EMR's usefulness and universal adoption is provision for legitimate and adequate training to all users for sustainability.

6.2 Recommendations

- While training has been iteratively enhanced with time, more work should be done and imaginative methods for tending to training needs.
- All trainings on the EMR ought to be done outside work days since it influences patients' consultation and the learning procedure.
- Proper interactive user manuals with troubleshooting guide should be developed and passed on to every user.
- There should be a knowledge assessment test at the end of every training session.
- Other than the consultants all other clinical staffs like nurses, technicians etc should also be trained as EMR is a part of the bigger HIS and are interlinked.
- Regular training should be conducted as there is a high staff turnover in Narayana Health group.
- Narayana Health should come up with a timeline for implementation at their centres so that users are well prepared in advance before the actual rollout happens.
- There is a need to keep upgrading the system as per the requirements and feedback of the users.

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ANNEXURE:

Narayana Health – Electronic Medical Records Department

Clinical service user perceptions on EMR system in OPD Consultation

Instructions:

- i. Please circle the desired option*
- ii. Please answer all the questions*

1. Are you using the EMR system for your OPD Consultations?

- a. Yes
- b. No (If “No” go to the end)

2. Gender

- a. Male
- b. Female

3. Age:

- a. Below 30 years
- b. 31 to 40 years
- c. 41 and above

4. How long have you worked in this unit?

- a. Less than 6 months
- b. 6-12 months
- c. 13-18 months
- d. 19-24 months
- e. Above 24 months

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5. Do you have any previous experience in using any form of EMR system?

- a. Yes
- b. No

6. How long have you been using the EMR?

- a. Less than 7 days
- b. 8-14 days
- c. 15-21 days
- d. More than 22 days

7. Which one is faster and easier to complete between the EMR and paper base records?

- a. EMR
- b. Paper form
- c. Both are about the same

8. In which is the information about patients more accurate?

- a. EMR
- b. Paper form
- c. Both are about the same

9. In which is the information about patients safer? (Privacy)

- a. EMR
- b. Paper form
- c. Both are about the same

10. Who trained you to use the EMR system?

- a. No one
- b. Was never trained
- c. By NH EMR staff
- d. By other hospital staff (IT, Front office etc)

11. How adequately did the training prepare you to use the EMR system?

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- a. Fully prepared
- b. Mostly prepared
- c. Somewhat prepared
- d. Not at all prepared
- e. Not applicable – I was never trained

12. Did you get enough support from NH EMR team after the training?

- a. No support
- b. Some support
- c. Full support

13. What do they support you with?

- a. Data entry issue
- b. System repair
- c. System up grade

14. How many patients do u consult in a day?

- a. Less than 10
- b. 11 to 20
- c. 21 to 30
- d. 31 to 40
- e. 41 and above

15. How much time do you usually take for one consultation (Paper based)

- a. Less than 5 minutes
- b. 6 to 10 minutes
- c. more than 11 minutes

16. How much time do you usually take for one consultation (EMR)

- a. Less than 5 minutes
- b. 6 to 10 minutes
- c. 11 minutes and above

17. How long (on average) is the wait on line for patients?

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- a. 0-20 minutes
- b. 21-40 minutes
- c. 41-60 minutes
- d. More than 60 minutes

18. Is wait time for patients any different now with EMR compared to paper based records?

- a. Shorter
- b. Same
- c. Longer

19. Is there is any change, how is patient's waiting time now?

- a. Significantly shorter
- b. Shorter
- c. No change
- d. Longer
- e. Significantly longer

20. How has the EMR changed the quality of care to your patients?

- a. Decreased significantly
- b. Decreased a little
- c. Not changed
- d. Improved a little
- e. Improved significantly

21. Between paper based record and EMR, which system do you prefer using?

- a. EMR
- b. Paper based
- c. Any (doesn't matter)

22. Do you ever encounter problems when entering data?

- a. Always
- b. Sometimes
- c. Rarely
- d. Never

23. Do you ever encounter problems when giving a printout to your patients?

- a. Always

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- b. Sometimes
- c. Rarely
- d. Never

24. Do you feel EMR is worth the time and effort required to use it?

- a. Yes
- b. No

25. Overall, are you satisfied with the EMR system?

- a. Fully satisfied
- b. Mostly satisfied
- c. Somewhat satisfied
- d. Not at all satisfied