

Internship Training

At

NARAYANA SUPERSPECIALITY HOSPITAL

HOWRAH

Project Title: - Physicians perspective of using EMR .Challenges, Barriers and facilitators in EMR adoption as well as implementation.

By

Name - Sapna

Enroll No. - PG/19/076

Under the guidance of

Dr Anandhi Ramachandran

PGDM (Hospital & Health Management)

2019-21



International Institute of Health Management Research

New Delh

Internship Training

At

NARAYANA SUPERSPECIALITY HOSPITAL

HOWRAH

Project Title: - Physicians perspective of using EMR .Challenges, Barriers and facilitators in EMR adoption as well as implementation.

By

Name - Sapna

Enroll No. - PG/19/076

Under the guidance of

Dr Anandhi Ramachandran

PGDM (Hospital & Health Management)

2019-21



International Institute of Health Management Research

New Delh

(Completion of Dissertation from respective organization)

The certificate is awarded to

Sapna

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

Electronic Medical records

And has successfully completed her Project on

Physician's perspective of using EMR. Challenges, Barriers and facilitator in EMR adoption as well as implementation.

Date _____

Organisation – Narayana Healthcare

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

We wish her all the best for future endeavours.



Training & Development

Head-Human Resources

TO WHOM SO EVER IT MAY CONCERN

This is to certify that, Sapna, student of PGDM (Hospital & Health Management) from International Institute of Health Management Research; New Delhi has undergone internship training at Narayana Healthcare from March to May 2021.

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

The internship is in the fulfillment of the course requirement.

I wish her all success in her future endeavors.

Ms. Divya Aggarwal

Associate Dean, Academic and Student Affairs
IIHMR, New Delhi

Dr. Anandhi Ramachandran

Associate Professor
IIHMR, New Delhi

Certificate of Approval

The dissertation titled **“Physicians perspective of using EMR. Challenges, Barriers and facilitators in EMR adoption as well as implementation”** at **“Narayana Healthcare”** is hereby approved as a certified study in management carried out and presented in a manner satisfactorily 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 do not necessarily endorse or approve any statement made, opinion expressed or conclusion drawn therein but approve the dissertation only for the purpose it is submitted.

Dissertation Examination Committee for evaluation of dissertation.

Name

Signature

Certificate from Dissertation Advisory Committee

This is to certify that **Dr. Sapna**, a graduate student of the **PGDM (Hospital & Health Management)** has worked under our guidance and supervision. She is submitting the dissertation titled **“Physicians perspective of using EMR. Challenges, Barriers and facilitators in EMR adoption as well as implementation”** at **“Narayana healthcare”** in partial fulfillment 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.



Dr Anandhi Ramachandran
Associate Professor

Mr. Koparthy Hemasai
Manager- EMR

IIHMR, Delhi

Narayana Healthcare

**INTERNATIONAL INSTITUTE OF HEALTH MANAGEMENT RESEARCH,
NEW DELHI
CERTIFICATE BY SCHOLAR**

This is to certify that the dissertation titled “Physicians perspective of using EMR. Challenges, Barriers and facilitators in EMR adoption as well as implementation

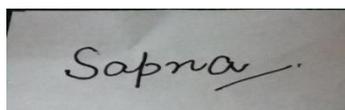
Submitted by Dr. Sapna

Enrolment No. - PG/19/076

Under the supervision of Dr Anandhi Ramachandran

For award of PGDM (Hospital & Health Management) of the Institute carried out during the period from 2019 to 2021

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.

A rectangular box containing a handwritten signature in black ink. The signature appears to be 'Sapna' with a horizontal line extending to the right.

Signature

FEEDBACK FORM

Name of the Student: Sapna

Dissertation Organization: Narayana healthcare

Area of Dissertation: Electronic Medical Records

Attendance: 99%

Objectives achieved: Perspective of physicians towards overall EMR usage and challenges, facilitators of EMR adoption and Implementation.

Deliverables:

Strengths: Hard working, ready to learn new things, opens to challenges

Suggestions for Improvement: Keep working hard, Focus on learning more and more

Suggestions for Institute (course curriculum, industry interaction, placement, alumni):



Signature of Officer-in- Charge/ Organization mentor

Date:

Place:

SYNOPSIS

Background and Rationale

EMR is Electronic Medical record. It is the first step to transformed healthcare. Electronic Medical Record systems are the computerized records of a patient's medical history in the form of text or images. Along with the patient's medical data, it may also contain Demographics, Medication and Allergies, Immunisation status, laboratory test results, Radiological images, Vital signs, Prescription and Billing information. EMR provides easy and quick access to patient's health information, secure access to patient's information, present a comprehensive patient's health information record; With easy, on-time access, EMRs also support better follow-up information for patients .The penetration of EMR in Indian market has been at a rate of 13.5 per cent. There are different challenges and hardships which are related to EMR adoption and its implementation at a healthcare facility. There are many factors that influence EMR adoption by Physicians. These factors are very crucial to understand the perspective and attitude of a physician towards adopting EMR.

This study proposes to understand about EMR adoption by practicing physicians, their overall perspective, opinions and experiences. It also focuses on exploring the challenges, the perceived barriers and facilitators for going digital.

Objective of the study

To assess physicians' perspective towards EMR adoption, and the barriers, challenges and facilitators to EMR adoption

Methodology

- ✓ Study design: Descriptive study
- ✓ Study population & sample: Healthcare providers and the physicians from Narayana Healthcare are the targeted sample
- ✓ Sampling Method: Random
- ✓ Sample Size = 30 Consultants from different clinical specialties - cardiology; General Practitioner; Gynecology; Hematology; Pediatric, Anesthetics ,Oncology etc at Narayana healthcare, to be approached and invited to participate in interview process.
- ✓ Study Method: Mixed Method
- ✓ Primary Data: Qualitative (In-depth interview with physicians)
- ✓ Secondary Data: Percentage increase in EMR adoption during the project duration of 3 months (march-may)

Additionally the behavior of users including interactions between users, patients and the system to be closely observed and noted to effectively understand the hurdles.

Expected Outcomes

The following outcomes are expected to be obtained:-

- 1) Understanding of the barriers and challenges in EMR adoption
- 2) In-depth knowledge of the facilitating factors existing in Narayana Health for EMR adoption of Physicians
- 3) Perception of doctors regarding the adoption and information about their journey and experience in going digital

Ethical considerations

Participants would be informed that their participation is voluntary and they can withdraw from the study at any point of time. There are no direct benefits in this research. The participants are not required to answer every question asked to them in the interview; they can pass on the question if it makes them uncomfortable. Also, they would be informed that this data may be used for EMR study in future.

Acknowledgements

The satisfaction and euphoria that accompany the successful completion of the project would be incomplete without the mention of the people who made it possible.

I convey my sincere gratitude to my corporate guide Mr. Koparthy Hemasai (Manager- Electronic medical records) who has guided me for this project. His experience, knowledge and support led me to complete my project timely and successfully. To my faculty mentor, Dr Anandhi Ramachandran, without her kind direction and proper guidance this study wouldn't have been a little success. In every phase of the project, their suggestion and guidance shaped this report to be perfect.

With deepest sense of gratitude and reverence, I express my thanks to Mr. Srinivas Narayan (Vice president- EMR) who granted me to do internship in their esteemed Organization. I am thankful to Mr. Prateek Jain (facility director- NSH) for giving me the opportunity to work at Narayana health.

I would like to thanks my seniors of EMR team who guided me at each step during the course of the project. I owe my whole hearted thanks and appreciation to entire staff at Narayana healthcare for their cooperation and assistance.

I sincerely acknowledge my institute IIHMR, Delhi for supporting me to experience the corporate world and work in one of the prominent hospital.

At last but not least gratitude goes to my friends Ms. Akriti Agrawal and Ms. Anchal singhal who helped me to complete this project report.

I hope I can build upon the experience and knowledge that I have gained and make a valuable contribution towards the industry in coming future.

Contents

List of figures and tables	13
List of symbols and abbreviations	14
Introduction	15
Methodology	18
Data interpretation	19
Results	20
Discussion	26
Conclusion	28
Recommendation	28
Reference	29

List of figures and tables

Table 1- Consultation form widgets

Graph 1- Thematic analysis of consultant's responses

- 1.1- Common challenges faced by consultants while using EMR
- 1.2- If they want to use EMR in future
- 1.3- How do they feel about using EMR
- 1.4- Did consultants get enough support from IT team and EMR team while using EMR
- 1.5- What according to them is most important benefit of using EMR

Graph 2- EMR Adoption data of Narayana healthcare consultants In 3 month's duration.

List of symbols and Abbreviations

EMR	Electronic medical records
CIMS	Clinical information management system
NH	Narayana healthcare
IT	Information Technology
OPD	Outpatient department
Gynae	Gynecology department

Physicians perspective of using EMR. Challenges, Barriers and facilitators in EMR adoption as well as implementation.

Introduction

EMR is Electronic Medical record. It is the first step to transform healthcare. (Mehta & Pandit, 2017) Electronic Medical Record systems are the computerized records of a patient's medical history in the form of text or images. Along with the patient's medical data, it may also contain Demographics, Medication and Allergies, Immunization status, laboratory test results, Radiological images, Vital signs, Prescription and Billing information. (Hatton et al., 2012) EMR provides easy and quick access to patient's health information, secure access to patient's information, present a comprehensive patient's health information record; with easy, on-time access. EMRs also support better follow-up information for patients. (*EHRs in Primary Care Practices*, n.d.) EMR software helps the organizations to increase their efficiency and quality of care too. Hospital settings can actually experience a decline in their expenditure by making the use of EMR system instead of paper records, as many published studies suggest. (Zaheer & Sayed, 2013) It also ensures safety of patient care by increasing transparency and providing availability of all information at one place quickly. (Noraziani et al., 2013) Thus, the patient too, can become more aware and be more involved in one's own healthcare process.

(Mehta & Pandit, 2017) The penetration of EMR in Indian market has been at a rate of 13.5 per cent. (Granlien & Hertzum, n.d.) There are different challenges and hardships which are related to EMR adoption and its implementation at a healthcare facility. There are many factors that influence EMR adoption by Physicians. (Abdekhoda et al., 2016) These factors are very crucial to understand the perspective and attitude of a physician towards adopting EMR.

In-house EMR software of Narayana healthcare is a web based hospital management and information system. This software is designed with the help of professionals and in house specialists from diverse field of medicine to provide cost effective solution for all types of hospitals.

The software supports a wide range of administrative and management functions and provides quick access to vital information.

The software consists of various modules and widgets designed with flexible functionalities to support OPD operations and patient care. Among different modules one of the essential modules is 'Electronic Health Records' (EHR). This module focuses on improving patient care as it functions as a central source of information for communication between administration, healthcare providers, covering the patient's history, observation, diagnosis and therapeutic conclusions and a wide variety of unstructured documents and information.

The software URL guides the physician to the doctor's dashboard, wherein demographic details such as patient name, MRN (Unique ID for patient), age and gender of the patient, phone no., any allergies of the patient are mentioned. A provision to view the encounter details, consultation type, status, appointment date, time, patient summary is also provided. The physicians can view their patients under each category separately namely – Inpatients, Outpatients, Day-care and Emergency. The software also provides a section for admissions, referrals, and lab results separately for the ease of access to physicians.

(N et al., 2017)The EHR application enables efficient management of patient data, allowing maintain accurate, complete, and up-to-date information about patients, and quickly retrieve this information, as needed, to make decisions about a patient's care and treatment.(Tsai et al., 2020) The application increases productivity, standardizes documentation, and enables enhanced patient care. There are several modules in the NH EMR software both for clinical and non-clinical purposes. To names a few, EHR, Bay management, Billing, Pharmacy, ADT (Admission, Discharge Transfer), Ambulatory, etc.

NH EMR provides following advantages;

- Promotes legible, complete, and up-to-date patient medical records, thereby helping reduce medical errors.
- Allows quick access to patient medical records, enabling improved diagnosis and treatment and a more coordinated and efficient care.
- Displays the complete patient chart on a single screen and allows you to compare the results over a period of time.
- Supports electronic prescriptions and investigation orders, which are automatically routed to respective pharmacies, laboratories, and imaging centers.
- Offers integration with SNOMED-CT codes.
- Provides easy access to test results and imaging reports.
- Provides an automated Favorites list to store frequently used entries.
- Performs automatic drug-to-drug and drug-to allergy interaction checking and alerts you if an unsafe combination or an allergy conflict is identified.

The EHR module includes the following features:

- *Doctor Dashboard:* Gives an overview of the same day's outpatient appointments. Allows us to access the patients' medical records and update the charts. Provides notifications for patient referrals, admissions, and investigation reports. Doctor can search patient by entering his name. Doctor can also see his inpatients, emergency and day care patients admitted under him from the dashboard itself. Doctor can click on start consultation button and open the patient chart and start writing the prescription in OPD.
- *Patient Charts:* Provides quick access to a patient's clinical records and medical history. Displays the complete chart on a single screen. Allows tracking and comparing their readings over a period of time .Features like Copying previous consultation notes, copying a protocol, manually entering the required details and completing the consultation are available.

- *Form Customization*: Allows customization of a Consultation Form and specify which sections are displayed in the form
- *Care Team Definition*: Allows us to define a common care team for a doctor which can be modified for individual patients, if require
- *Consultation Notes*: Offers an easy-to-use interface to record consultation notes. Provides multiple ways to record consultation notes. Includes an automated "Favorites" list to store the frequently used entries. Order sets to be used for medication and investigation orders often used for a single disease.

Upon starting of an encounter, the software guides the physician to patient chart, i.e., the consultation form for that specific patient. It contains the patient name, MRN, age, gender, phone no., allergies. It contains the details of the encounter along-with date, consultant name, status of consultation and consultation type. The various sections on the consultation sheet known as "Widgets" are required to be filled by the consultant depending on the history of the patient. The consultant can also view the patient summary where they can check the whole history of the patient, anything that has been entered by another consultant and investigation and radiology reports as well. The widgets are customizable and can be re-arranged according to the convenience of the consultant.

A consultation form can include the following sections (widgets)

Admission Request	Family History	Past Medical History
Allergy	Follow-Up	Radiology Results
Attachments	General Examination	Social History
Chief Complaints & HPI	Investigation Orders	Surgical History
Cross-Consultation	Laboratory Results	Systemic Examination
Current Medications	Medication Orders	Vitals
Diagnosis	Notes	
Diagram	Other Results	

Table 1- Consultation form widgets

To create an admission request, following details are needed such as name of admitting consultant, department, admission type, admission category, priority, reason etc. Allergy can be documented. Once it is done, it pops on the top of consultation chart. Every time the patient chart is opened, doctor sees the allergy.

Current medications and past medications can also be seen. Medication order can be placed accordingly. Current medication can be stopped if needed. Also, drug refill order can also be placed. Icons to select dose, duration, route, taper etc are available.

The software is also integrated with CIMS (Clinical Information Management System) Drug Interaction, where the following interactions will be alerted in the form of pop up box:

- Drug to Drug Interaction
- Drug to Allergy Interaction
- Drug to Disease Interaction
- Drug Information

This provides essential clinical decision support to help optimize clinician's time and improve the quality of patient care.

(Najaforkaman, Mohammadreza, 2016) Generally, there are different factors that affect EMR adoption and its usage.

- Individual factors like Age, computer literacy, Individual experience with prior use of EMR etc
- Psychological factors like Resistance to change, user attitude towards going digital, Technological readiness, Perceived usefulness and ease of use, System uncertainty etc.
- Behavioral factors like Behavioral and attitudinal changes, Perceived consequences of using EMR, Automatic behavior of doctors to write paper prescriptions etc
- Environmental factors like locality of the hospital, demographic condition, Network effects, Optimal usage of EMR, Reputation of practice etc
- Organizational factors like Cultural changes, age of practice, Type of practice(Single/Multispecialty) ,experience, Interaction between practitioners and patients, workflow issues, Task fit etc.
- Legal factors like security and privacy concerns, legal liability concerns ,policies and standards etc
- Technical factors like Training and support, system reliability, system usability, Time, Stepwise implementation etc.
- Infrastructural factors like System availability, infrastructural maintenance etc.
- Financial factors like vendor cost, cost of technical infrastructure etc.

This study proposes to understand about EMR adoption by practicing physicians, their overall perspective, opinions and experiences. It also focuses on exploring the challenges, the perceived barriers and facilitators for going digital.(Mason et al., 2017) Understanding of the physician's view of EMR technology will help to eliminate barriers and enhance the adoption of currently available technology that improves patient care and the accessibility of patient records.(Brooks & Grotz, 2010) Overcoming barriers is the most crucial step for EMR implementation.

Methodology

- Study design: Descriptive study design was taken for the study.
- Study population & sample: Healthcare providers / physicians from different specialties' at Narayana Healthcare are the targeted sample
- Sampling Method: Convenience Sampling method was used to select the sample for study
- Sample Size: The final sample comprised of 30 consultants/physicians from different specialties'. Physicians from Cardiology, General Medicine,

Gynecology, Hematology, Pediatric, Anesthetics, Oncology, and Orthopedics etc. at Narayana healthcare were approached and invited to participate in the interview process.

- Primary Data: Qualitative (In-depth interview with physicians) study was conducted to explore physicians experiences with adoption of EMRs into their day to day practice. Open ended Questions were asked to know their perception about using EMR regularly and also in future.

At the time of the study, Consultants were in a position to reflect on their EMR implementation experiences and to give feedback about its usage.

Secondary Data: Percentage increase in EMR adoption during the project duration of 3 months (march-may) at Narayana health is taken to get an idea about challenges that might have been faced by physicians to adopt EMR.

Additionally the behavior of users, including interactions between users, patients and the system were closely observed and noted to effectively understand the hurdles.

The goal of our analysis was to understand common challenges and facilitators between users who are new adopters as well as who are advanced users.

Data collection and interpretation

A semi-structured interview was conducted with all participants at their respective OPDs by me. The interview questions explored the implementation process and barriers and facilitators to EMR usage. The questions were open ended and detailed answer for each question was recorded and analyzed.

The questions included “How do you discuss problems associated with the EMR? What challenges have you faced with regard to using the EMR? Would you like to use EMR in future? Do you like using EMR for all your patients? Did you get enough support from the EMR team, operations team and IT Team to make EMR easy for you? Do you like using Overall EMR? Etc.

A brief description was developed to capture the context, and field notes were generated after the interviews. All the interviews were audiotape, and checked for accuracy later on.

Thematic analysis of the qualitative data was done using Microsoft excel. Themes were generated for different open ended questions and results were put according to themes and analyzed accordingly.

Trustworthiness and credibility of the data analysis was enhanced by taking detailed field notes, and debriefing sessions after each interview. The debriefing sessions, conducted by me promoted the iterative nature of the data collection and analysis through additions and alterations to the semi-structured interview guide as appropriate.

Results

All the participants in this study were new to using the EMR software. Consultants/participants varied in their experience with computers, the EMR usage amount and their EMR knowledge level.

At Narayana health, there are mainly behavioral factors, Infrastructural factors, Individual and Psychological factors that affect EMR adoption and implementation. Analysis of the data showed two themes-

(1) Barriers (i.e., level of computer literacy, training and retraining requirement, time, resistance to change and infrastructure) and facilitators (i.e., having in-house problem solvers like the IT team and EMR team,)

(2) A sequence of EMR adoption (i.e., levels of knowledge ranging from beginner to advance and responses to the EMR that included consultant's journey of going digital.)

Based on Interviews with the participants, barriers and facilitators of EMR were noted and their overall journey from adopting it to using EMR for all their patients was analyzed

Computer literacy emerged as a barrier for many participants from different specialties'. Mostly this barrier was seen more in Aged physicians (60+ years old).

One Participant from Gynae department summarized his journey and barriers as;

I know how to use computers but EMR is difficult to use as it needs lot of clicking and clicking. So many features are incorporated in this software and it needs a lot of assistance from EMR team. It is not simple as starting the consultation and ending it with 2 clicks on the computer. And at this age, learning technology is a challenge for me.

Other participant from General medicine department said;

It's not easy to work on computers when patient is sitting for consultation. It distracts me from the treatment plan as working on computers takes time for me. I am not tech savvy and it is uncomfortable to type and work on EMR for that reason. I will be used to doing EMR if assistance is provided on a regular basis. And I am trying my best to go digital.

Time emerged as 2nd most important barrier for using EMR at Narayana health. Most participants felt that EMR takes a lot of time and writing paper prescriptions are easier especially during high footfalls and lots of appointments for the consultants in a single day.

One participant from Medical oncology department said;

We work as a team in Oncology department. Sometimes, we see more than 100 patients per day. And we have to attend meetings, go for Chemo sessions, and also for inpatient rounds. We as a team are very comfortable with the technology and EMR; also we understand the usefulness and benefits of storing medical data digitally. It's just because of heavy workload that we escape doing EMR.

Other participant from Hematology department felt time as a barrier because according to him, EMR needs both time and training. Learning is easy but applying that in practice is rather tough.

He said; - In starting I felt it difficult to adopt but EMR takes time and practice. Time shortage makes it difficult to apply the knowledge gained through EMR training sessions and applying it in real time. Down time is needed for this.

The amount of time required to record information in the EMR was not appreciated initially. Consultants said we didn't cut down our patient footfall while shifting from paper records to digital records. We had to stay longer to make ourselves comfortable with the software.

Psychological barriers also affect EMR adoption and usage at a great level. Resistance to change is the biggest problem for EMR adoption. Few consultants don't want to shift from their paper prescriptions to digital prescription. They are worried for the technological readiness.

A participant from Gynecology department said;-

I do EMR only when there are no paper pads available on my desk. Paper prescriptions are so easier. I understand the usefulness of using EMR but it's not user friendly.

EMR software's Mandatory fields and No specific customized templates for different departments emerged as a barrier.

As one participant said;-

I loved to use EMR software beforehand when we had specific templates for our department but in this new EMR software, we don't have that and I personally feel its not so user friendly software. There a lot many mandatory sections, lot many clicks and selecting from the drop down option is not friendlier.

In-house teams of problem solvers are the facilitators of EMR at Narayana healthcare. The IT team, back end engineering team, Operations team and the EMR team is always there to provide assistance to Consultants whenever they face any issues with the software. This is an ongoing process and consultants appreciate the effort and try to use EMR.

One participant from Gastrology department described his journey as;

One day I was unable to view my patient's laboratory reports on EMR software. I needed to view that immediately. So, I called up the EMR team and IT team and they helped in loading the reports on the software. Also, they asked me to install the mobile app that is available for consultants in which medical records of all patients admitted under me can be viewed.

EMR Adoption Continuum

Participants self-described their level of EMR knowledge as ranging from beginner to advanced. In turn, it appeared the barriers and facilitators they experienced influenced their level of EMR adoption. Beginner EMR users faced great challenges.

They said;

It is easy to learn at first but it has so many steps and so many features. It takes time to get used to its functionalities. Fast learning is the key and when we have many numbers of patients, learning is slowed down and we just focus on treatment plan of the patient.

Advanced users were able to realize the benefits of the EMR to their practices.

A participant from Oncology department said;

It is very comfortable to find patient chart right at the front. Patient summary is visible all at once. I don't have to get the reports from here and there. The data i get is legible and all the minute details of allergies and immunizations, drug dosage can be incorporated with just one click.

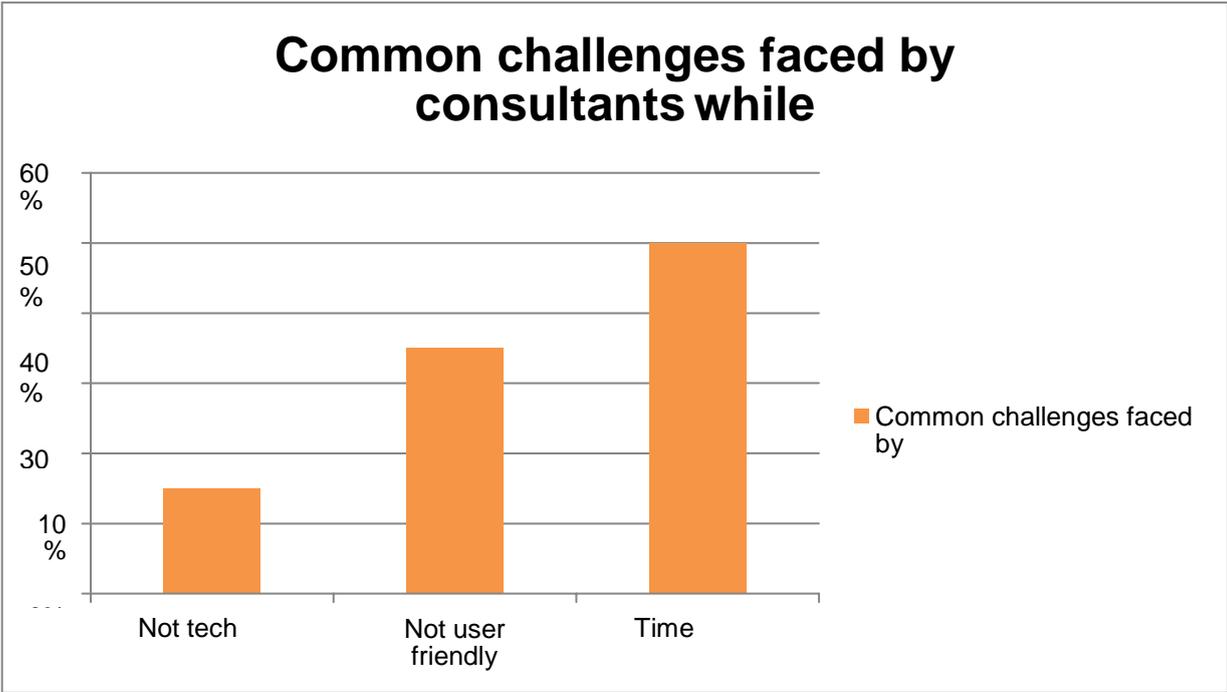
Participants described their own personal journey across the EMR adoption continuum and comfort level with the EMR: one participant said;-

It's been a struggle, but we made it. It's like climbing a mountain, we're not at the top yet, but I think we've come a long way. Firstly, I was very uncomfortable with EMR but as time passed and i got used to it, started loving it now as my patient details are just a click away.

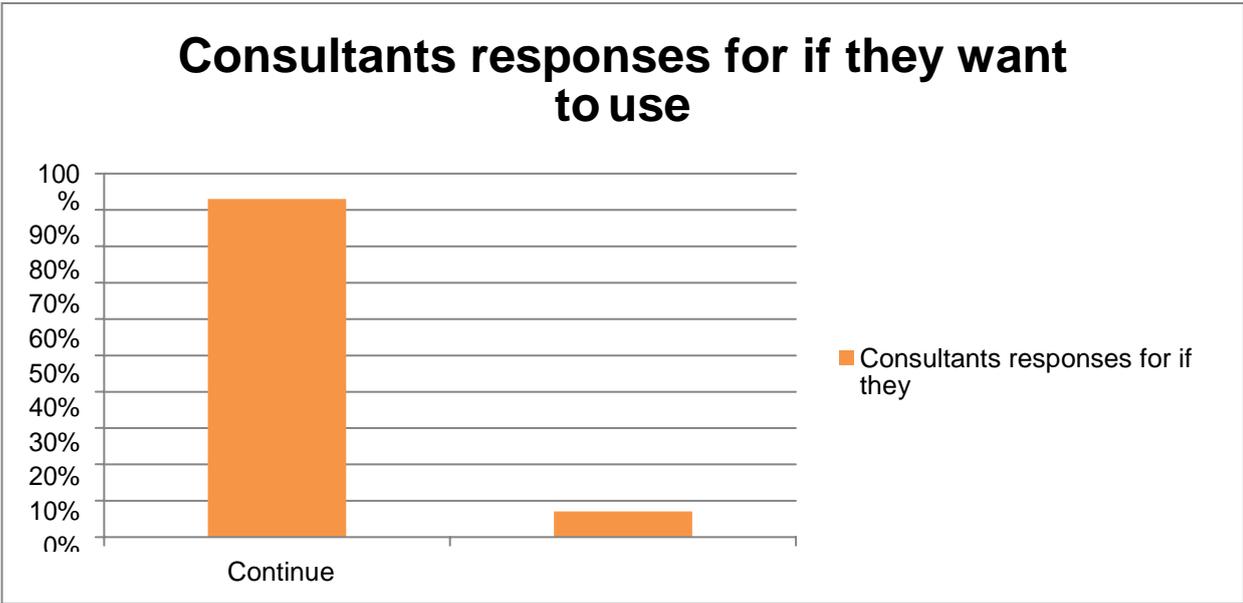
Feelings of frustration were described by many participants due to little knowledge of the EMR program combined with issues related to the hardware. System installation and printer installation in each OPD was done so that physicians are comfortable in doing EMR.

Reluctance and resistance to change also played a role in the transition process. As one participant said;-

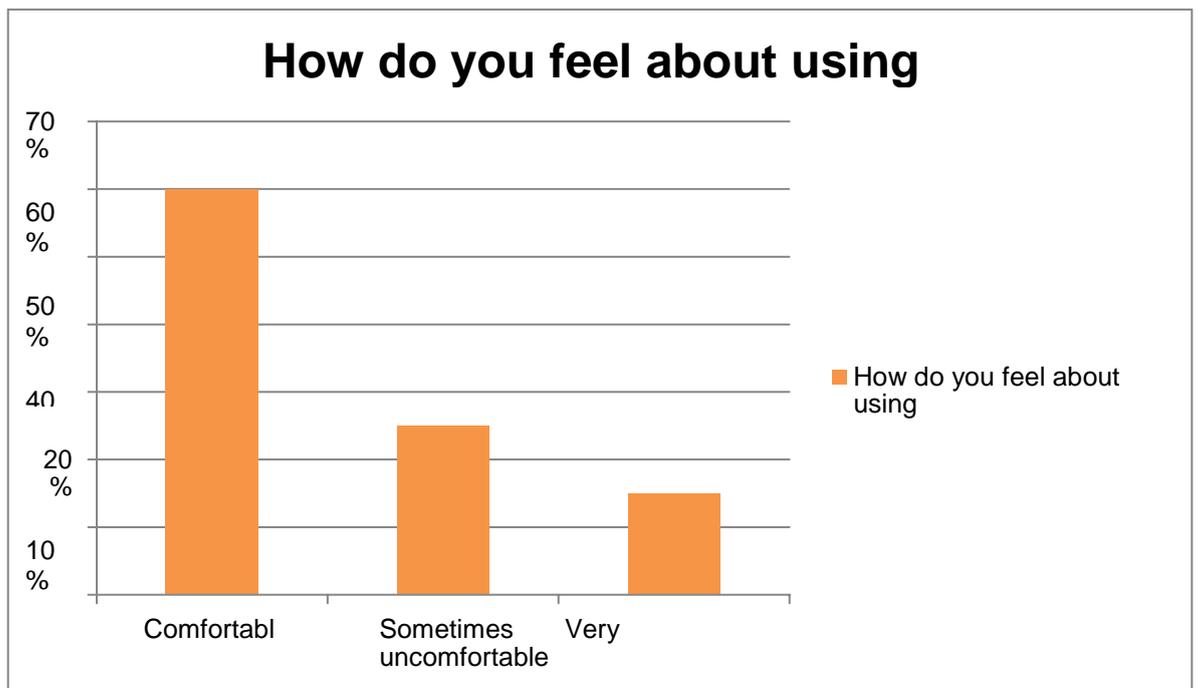
Initially, a couple of the doctors were eager to try new things out, but the rest of us were a little reluctant .I don't know if I was reluctant but definitely not so ready to use EMR in daily practice. I was so doubtful that would I be able to use EMR for all my patients from now?



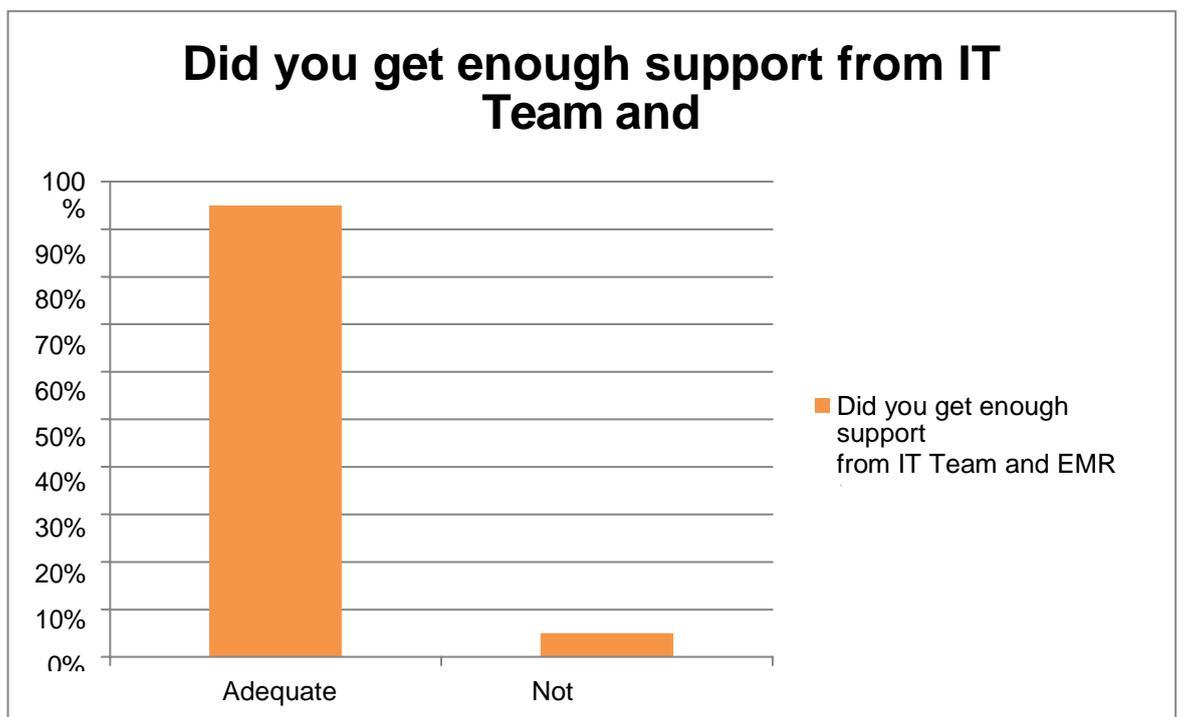
Graph 1.1- Thematic analysis
 (Not tech savy- 15%, not user friendly software-35%, time consuming-50%)



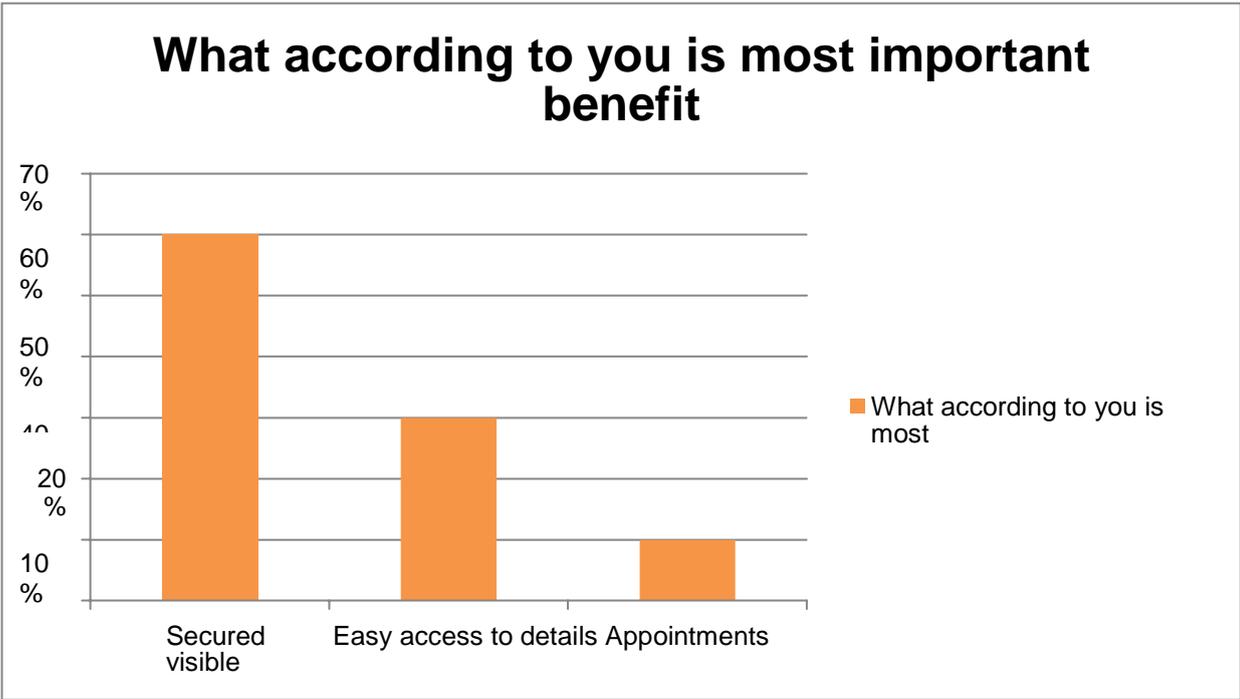
Graph 1.2- Thematic analysis
 (Continue to use- 93%, not sure- 7%)



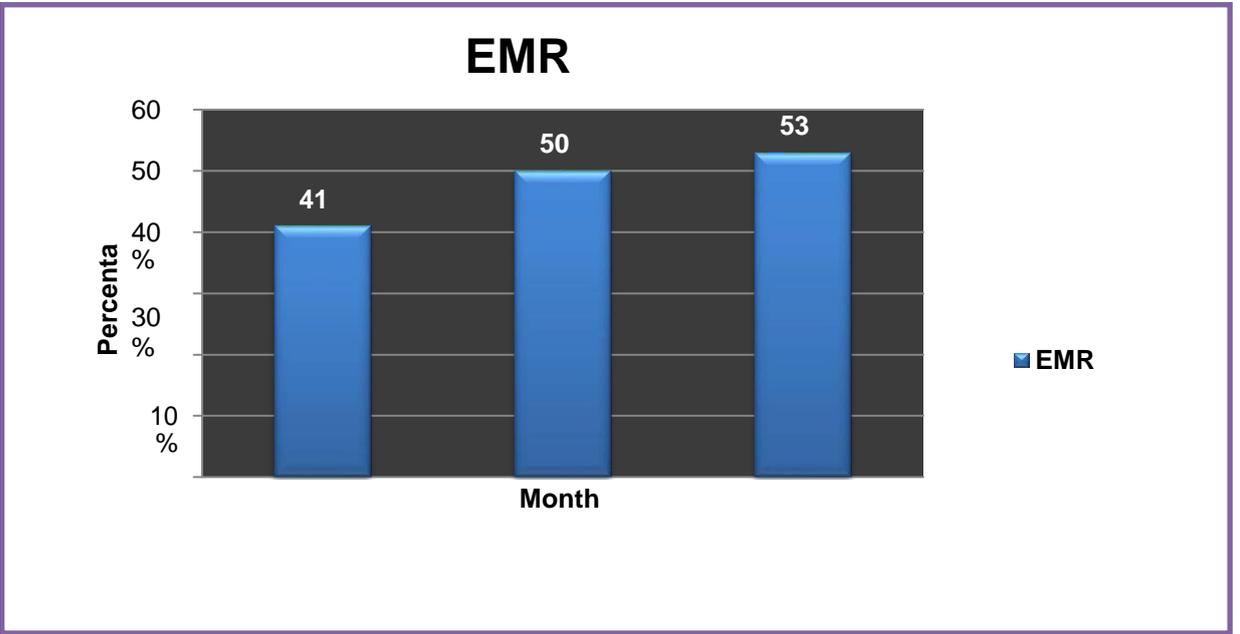
Graph1.3- Thematic analysis
 (Comfortable in using-60%, sometimes uncomfortable-25%,
 Very uncomfortable- 15%)



Graph 1.4- Thematic analysis
 (Adequate support-95%, not adequate-5%)



Graph 1.5- Thematic analysis
 (Secured documentation- 60%, easy access to details-30%,
 Appointments visible-10%)



Graph 2- EMR Adoption data of Narayana health consultants in 3 months duration

Discussion

Thematic analysis of the data collected by one on one interviews with doctors was done. When asked about common challenges faced by them during EMR use

- 50% consultants felt EMR is time consuming
- 25% felt EMR to be not so user friendly
- 15% felt themselves to be non tech savvy.

Thus, according to the study, these three are main challenges for EMR usage.

Next, when asked about their wish to continue EMR in Future, 93% showed positive response, and 7% showed uncertainty.

When asked about their comfort level and their experience in using EMR, 60% of them are uncomfortable, 25% finds it difficult and 15% finds it very uncomfortable.

To understand their views on Facilitators of EMR, Consultants were asked if they are satisfied with the support of IT team, EMR team and Operations team, 95% of consultants are satisfied with the support, 5% are unsatisfied.

Consultants were also asked to elaborate on the most important benefit of using EMR.60% consultants said EMR provides secured documentation, 30% consultants said EMR provides easy access to patient details and10% said that it helps to see appointment details.

This study examined the views of Physicians regarding EMR implementation and adoption (Terry et al., n.d.)

Two key themes emerged:

- (1) Barriers and facilitators to EMR implementation and adoption
- (2) A continuum of EMR adoption.

Major barriers to implementation and adoption included computer literacy, resistance to change, and time. (McGinn et al., 2011)When considering EMR implementation, it could be advantageous to assess not only levels of computer skills but also how much the person is comfortable with computer skills. (Berihun et al., 2020)Successful implementation and sustainability of an EMR system utilization in healthcare industries depend on the computer skills of all healthcare professionals who were exposed in using it Training, retraining, infrastructural requirements and attitudinal changes still remain a challenge to be met for every physician at Narayana health(*EHRs in Primary Care Practices*, n.d.). “Implementation of EMR changes the unique way of patient care, which is developed by physicians over the years, and is itself a critical concern.(McGinn et al., 2011) As the change in patient care not only goes along with a switch from the paper records to the EMR system, also leads to change in organizational aspects. (Dutta & Hwang, 2020) Dutta and Hwang explored difficulties that arise during the work flow change process, for example,(Hasanain et al., 2014) change of organizational culture, issues regarding implementation creating a barrier to improve the quality of care. (Duncan et al., 2018)Implementation of EMR changes the unique way of patient care, which is developed by physicians over the years, and is itself a critical concern. (Kruse et al., 2016)As the change in patient care not

only goes along with a switch from the paper records to the EMR system, also leads to change in organizational aspects. (Zaheer & Sayed, 2013) Thus, an EMR friendly culture could support organization-wide use of EMR and improve the potential of successful implementation of EMR”

(O’Donnell et al., 2018) Donnell described “Lack of time, knowledge and expertise to manage the implementation process was also an adoption barrier. Practices that experienced simpler transitions to EMR use had redesigned work flows and developed policies to support its implementation. (Barbe, 2015) Lastly, having a designated EMR person could facilitate improved EMR.

(Ilie et al., 2007) As discussed by many physicians, EMR has had several impacts on physicians’ time, expertise, physicians’ learning, the length (and sometimes the accuracy) of the clinical notes. (Agniel et al., 2018) So, the challenges in EMR implementation process are many and needs adequate attention of problem solvers and physicians.

(Smith & Newell, n.d.), There is no doubt that an electronic medical record requires dedicated attention, staffing, and commitment during the preparation and actual implementation phases. (*EHR Acceptance Factors in Ambulatory Care*, 2009) In addition, there is no substitute for physician involvement and representation in these early stages of the project, as well as on the ongoing basis for the life of this tool. It is in accordance with the findings of this research paper as Adoption challenges are major concern for EMR at any hospital setting, may it be Narayana health.

(Lakbala & Dindarloo, 2014) Lakbala observed many physicians both show their resistance to EMR and also positive attitude towards implementation of EMR. (Tsai et al., 2020) They are just not ready for change management but they too believe that EMR is very useful.

(Jawhari et al., 2016) Physicians adopt EMR easily because they understand the usefulness of it and agree on fact that it helps in secured documentation and easy access to medical records. (Alfarra, n.d.) According to Alfarra, of even greater importance is the fact that the EHR are automatically updated and concurrently available for use at any time and in any other linked medical facility, which indicate completeness medical record, accuracy, and guaranteed legibility.

(Granlien & Hertzum, n.d.) Understanding the primary barriers and working on overcoming them will definitely help in increasing EMR adoption rate.

(Terry et al., n.d.) Perspective of physician varies regarding EMR but they know the usefulness of EMR and (Jawhari et al., 2016) understands the pros and cons of using EMR.

In this study, in-house problem-solvers emerged during the EMR implementation and adoption process; these individuals played an important role in addressing day-to-day issues related to the EMR. (Jawhari et al., 2016) It can be successful when every physician who is an EMR user is given specific time slots for EMR training and Follow up.

Conclusion

This study highlights the importance of being both aware of and responsive to factors that can influence EMR implementation and adoption. They include paying attention to computer literacy; setting aside dedicated time for EMR implementation and adoption, as well as engaging in training activities; and supporting problem-solvers in the practice. It is also worth acknowledging that there will likely be different levels of EMR knowledge and adoption among members of primary health care practices. To encourage success, mechanisms should be put into place to promote the movement of practices across the continuum of EMR adoption.

Recommendations

Keeping in view the results obtained from the in-depth interviews with physicians and getting challenges and facilitators of EMR and knowing their perspectives, I would recommend following points for increasing EMR usage and adoption;

- Give training on a regular basis step by step to physicians who are beginners in using EMR. Provide assistance on call also if needed.
- First, brief them about EMR, and make them understand the usefulness of it. Then, try to teach them. Attitudinal change management is the need of the hour.
- Meet all the infrastructural requirements in terms of systems, printers etc. Take support from IT for maintenance of infrastructural and issues if any.
- Make EMR use simple for consultants by making all possible features like favorite list, order sets etc in their consultation chart.
- Customized template for each department separately can be made so that it becomes user friendly for them.
For example- Gynae department template can contain labor records, risk about certain procedures, obstetrics notes etc.
- Doctors find the location of infrastructure not so proper in different OPDs. Ergonomics should be taken in consideration to decide on keeping the system and printer on proper places and proper height at OPDs so that it doesn't strain the physicians while doing EMR
- Nurses or personal assistants of consultants should be trained in using EMRs on behalf of consultant in case of heavy workload.
- Navigating to different consultation charts feature while doing a consultation and copying from different charts into one chart can save lots of time for the consultants.
- Voice recognition feature for typing be incorporated so that consultants just speaks and it gets typed in the consultation chart. It can save a lot of time for the consultants.
- Personal assistant should be provided to Consultants who consider themselves not tech savvy and who believe they can't do EMR properly after repeated training sessions. Also No mandatory sections should be there in EMR consultation chart. It should depend on Individual consultants wish to keep one or more sections In that way, it can save time for consultants.

References

- 1Abdekhoda, M., Ahmadi, M., Dehnad, A., Noruzi, A., & Gohari, M. (2016). Applying Electronic Medical Records in health care: Physicians' perspective. *Applied Clinical Informatics*, 07(02), 341–354. <https://doi.org/10.4338/ACI-2015-11-RA-0165>
- Agniel, D., Kohane, I. S., & Weber, G. M. (2018). Biases in electronic health record data due to processes within the healthcare system: Retrospective observational study. *BMJ*, k1479. <https://doi.org/10.1136/bmj.k1479>
- Alfarra, N. (n.d.). *A Qualitative Study of an Electronic Health Record: Perspectives on Planning Objectives and Implementation at King Faisal Specialist Hospital & Research Centre (Kfsh & Rc), Saudi Arabia*. 6.
- Barbe, D. (2015). *EHR Innovation and Problem-Solving: Physician Perspective*. 10.
- Berihun, B., Atnafu, D. D., & Sitotaw, G. (2020). Willingness to Use Electronic Medical Record (EMR) System in Healthcare Facilities of Bahir Dar City, Northwest Ethiopia. *BioMed Research International*, 2020, 1–9. <https://doi.org/10.1155/2020/3827328>
- Brooks, R., & Grotz, C. (2010). Implementation Of Electronic Medical Records: How Healthcare Providers Are Managing The Challenges Of Going Digital. *Journal of Business & Economics Research (JBER)*, 8(6). <https://doi.org/10.19030/jber.v8i6.736>
- Duncan, T., Rahim, E., & Burrell, D. (2018). *Challenges in Healthcare Post-EMR Adoption*. 7.

- Dutta, B., & Hwang, H.-G. (2020). The adoption of electronic medical record by physicians: A PRISMA-compliant systematic review. *Medicine*, 99(8), e19290. <https://doi.org/10.1097/MD.00000000000019290>
- EHR Acceptance Factors in Ambulatory Care: A Survey of Physician Perceptions / Perspectives*. (2009, December 15). <https://perspectives.ahima.org/ehr-acceptance-factors-in-ambulatory-care-a-survey-of-physician-perceptions/>
- EHRs in Primary Care Practices: Benefits, Challenges, and Successful Strategies*. (n.d.). AJMC. Retrieved June 8, 2021, from <https://www.ajmc.com/view/ehrs-in-primary-care-practices-benefits-challenges-and-successful-strategies>
- Granlien, M. S., & Hertzum, M. (n.d.). *Barriers to the Adoption and Use of an Electronic Medication Record*. 14.
- Hasanain, R., Vallmuur, K., & Clark, M. (2014). Progress and Challenges in the Implementation of Electronic Medical Records in Saudi Arabia: A Systematic Review. *Health Informatics - An International Journal*, 3(2), 1–14. <https://doi.org/10.5121/hij.2014.3201>
- Hatton, J. D., Schmidt, T. M., & Jelen, J. (2012). Adoption of Electronic Health Care Records: Physician Heuristics and Hesitancy. *Procedia Technology*, 5, 706–715. <https://doi.org/10.1016/j.protcy.2012.09.078>
- Ilie, V., Courtney, J., & Slyke, C. (2007). Paper versus Electronic: Challenges Associated with Physicians - Usage of Electronic Medical Records. *2007 40th Annual Hawaii International Conference on System Sciences (HICSS'07)*, 142–142. <https://doi.org/10.1109/HICSS.2007.424>
- Jawhari, B., Ludwick, D., Keenan, L., Zakus, D., & Hayward, R. (2016). Benefits and challenges of EMR implementations in low resource settings: A state-of-the-art review. *BMC Medical Informatics and Decision Making*, 16(1), 116. <https://doi.org/10.1186/s12911-016-0354-8>

- Kruse, C. S., Kristof, C., Jones, B., Mitchell, E., & Martinez, A. (2016). Barriers to Electronic Health Record Adoption: A Systematic Literature Review. *Journal of Medical Systems, 40*(12), 252. <https://doi.org/10.1007/s10916-016-0628-9>
- Lakbala, P., & Dindarloo, K. (2014). Physicians' perception and attitude toward electronic medical record. *SpringerPlus, 3*(1), 63. <https://doi.org/10.1186/2193-1801-3-63>
- Mason, P., Mayer, R., Chien, W.-W., & Monestime, J. (2017). Overcoming Barriers to Implementing Electronic Health Records in Rural Primary Care Clinics. *The Qualitative Report. https://doi.org/10.46743/2160-3715/2017.2515*
- McGinn, C. A., Grenier, S., Duplantie, J., Shaw, N., Sicotte, C., Mathieu, L., Leduc, Y., Légaré, F., & Gagnon, M.-P. (2011). Comparison of user groups' perspectives of barriers and facilitators to implementing electronic health records: A systematic review. *BMC Medicine, 9*(1), 46. <https://doi.org/10.1186/1741-7015-9-46>
- Mehta, N., & Pandit, A. (2017). Perceptions of EMR System by Doctors in Pune (India). *Indian Journal of Public Health Research & Development, 8*(4), 540. <https://doi.org/10.5958/0976-5506.2017.00396.5>
- N, M., Mf, S., & F, S. (2017). Electronic Health Record Management: Expectations, Issues, and Challenges. *Journal of Health & Medical Informatics, 08*(03). <https://doi.org/10.4172/2157-7420.1000265>
- Najaftorkaman, Mohammadreza. (2016). *Facilitators and Barriers to User Adoption of Electronic Health Record Systems. https://doi.org/10.25904/1912/3825*
- Noraziani, K., Ain, A. N., Azhim, M. Z., Eslami, S. R., & Drak, B. (2013). *An Overview of Electronic Medical Record Implementation in Healthcare System: Lesson to Learn. 11.*

- O'Donnell, A., Kaner, E., Shaw, C., & Haighton, C. (2018). Primary care physicians' attitudes to the adoption of electronic medical records: A systematic review and evidence synthesis using the clinical adoption framework. *BMC Medical Informatics and Decision Making*, 18(1), 101. <https://doi.org/10.1186/s12911-018-0703-x>
- Smith, D., & Newell, L. M. (n.d.). *A Physician's Perspective: Deploying the EMR*. 9.
- Terry, A. L., Giles, G., Brown, J. B., Thind, A., & Stewart, M. (n.d.). Adoption of Electronic Medical Records in Family Practice: The Providers' Perspective. *Family Medicine*, 41(7), 5.
- Tsai, C. H., Eghdam, A., Davoody, N., Wright, G., Flowerday, S., & Koch, S. (2020). Effects of Electronic Health Record Implementation and Barriers to Adoption and Use: A Scoping Review and Qualitative Analysis of the Content. *Life*, 10(12), 327. <https://doi.org/10.3390/life10120327>
- Zaheer, S., & Sayed, S. A. (2013). Evaluation of EMR Implementation in a Private Hospital from User's Perspective. *GSTF International Journal of Nursing and Health Care*, Volume 1 Number 1, 1(1). https://doi.org/10.5176/2345-718X_1.1.25