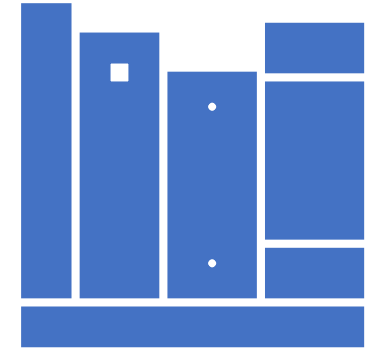




SUMMER TRAINING REPORT

Under the guidance of
Dr. J.P Singh Sir

By- Dr Aditi Gulati

MBA-HM-25



1052

Summer Training
at
Impact Guru
From 10th May 2021 to 3rd July 2021

&

A Report on
**Barriers in the adoption of Electronic Medical Records among
physicians' in India: A Systematic Review**

MBA- Health and Hospital Management
2020-22





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About the Organization

- Impact Guru, a crowdfunding platform supporting donations for various NGOs, Start-ups, social enterprises and individuals through global crowdfunding. The start-up was incubated in Harvard Innovation Lab, USA in August 2014. It was PACT in Impact Hub, Singapore in May 2015.
- It was founded in 2014 by Piyush Jain who is a Wharton Business School graduate and the co-founder is Khushboo Jain who is Welingkar Institute of Management alumnus. It was launched in September, 2015 by Maneka Gandhi.
- Impact Guru is a financial technology company that provides comprehensive crowdfunding solutions that combine social media crowdfunding, rewards, and investment.
- It has helped raise funds for more than 10 thousand people from more than 10 lakh donors and about 1500 crore raised. With their innovative technology, Impact Guru has made fundraising easy, accessible and effortless for people in need

➤ The type of crowdfunding Impact Guru deals in are:-

1. Medical Crowdfunding
2. Organ transplant Crowdfunding
3. Cancer Crowdfunding
4. NGO Crowdfunding
5. Education Crowdfunding
6. Creative Crowdfunding

Vision

- Impact Guru believes in the power to make someone smile, to save life, to foster great ideas, to make social change and to have an impact.

Mission

- To make healthcare affordable to save lives today and secure families for a better tomorrow.

Observational Learning

- The organization is divided into various departments mainly, Human resource, finance, public relations, administration, product and technology, sales and business development, customer feedback, marketing, communication, donor retention and social media or creative teams.
- The business development team works and arrange meetings with doctors or staff of hospital management for information of patients who require crowdfunding help for their treatment cost. The team works with the social media marketing team to start a campaign for donor engagement.
- ***Business Development Department:-***
 1. Head:- Mr. Sandeep Tripathy
 2. Reporting Manager:- Mr. Avin Nair
 3. Other team members:- Mr. Roopesh Kumar Jha, Ms. Quba, Mr. Anish, Ms. Bhavna Nahata and Ms. Pavithra.



Organization Responsibilities

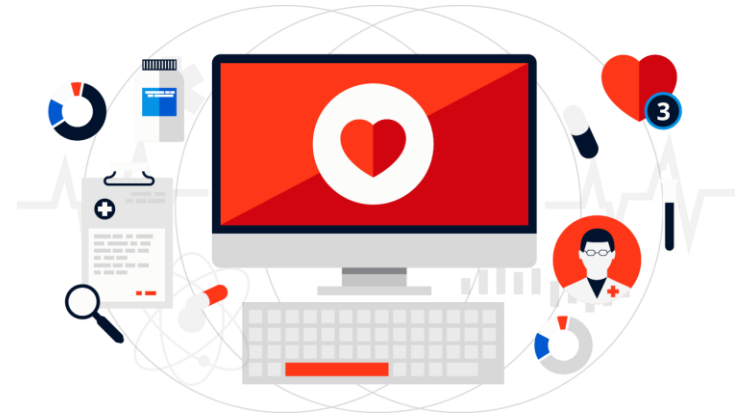
1. Dealing with the doctors and management of the hospitals to help start and create a campaign for fundraising
2. To support the business development function of the organization.
3. Participate in efforts to extend the amount of campaign creators.
4. Organize and attend meetings with doctors or management staff of hospitals.
5. Lucknow city hospitals and doctors to be contacted.

Project Report

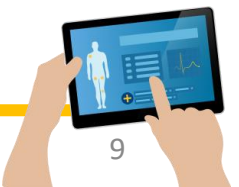
Barriers in the adoption of Electronic Medical Records among physicians' in India



Introduction



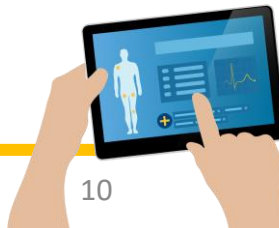
Electronic Medical Record (EMR) is a digital or electronic collection and storage of medical information about a person. It includes a patient's medical details like medical history, diagnosis, allergies, tests, medications, immunizations and treatment plans.⁽¹⁸⁾ EMR is important in today's digital world for hospitals and health-care organizations. Physicians should use such technology as it is far better than paper records as it is adaptable and saves time. Usage of EMR or EHR will improve quality of health care thus improving the healthcare delivery system.⁽¹⁹⁾ India, as a developing country, is in need of a quality healthcare delivery system. The government has led to many initiatives for adoption of EMR and EHR in hospitals and healthcare organizations. However, a proper system is not maintained and tracked on adoption of EMR by the government.⁽¹⁾



Rationale



The implementation of EMR by various government policies has been increased in India but still EMR/EHR is not adopted by many hospitals and healthcare organizations. It is essential to study the potential barriers and challenges in adoption of EMR among physicians. Thus, the main aim of this study is to explore and evaluate various barriers for adoption of EMR as perceived by the physicians in India by reviewing literature systematically based on the published studies. This will help to have a broad perspective about the situation and work accordingly for future implementation of EMR.



Research Question

What are the barriers in the adoption of Electronic Medical Records among physicians' in India?



Objectives

1.

To find out the common barriers in adoption of EMR in India.

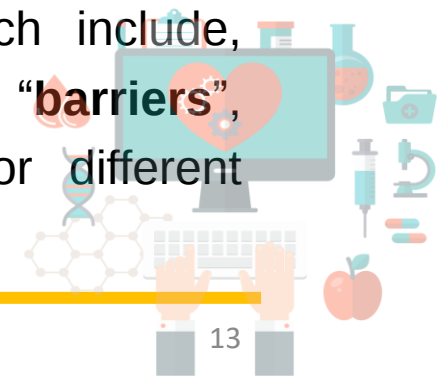
2.

To help in a way forward for proper implementation of EMR.



Methodology

- **Study Design:** Descriptive study based on systematic literature review
- **Information sources:** The search was carried out using three databases for the present review which includes, PubMed, ResearchGate, BMC-Medical and unpublished sources include Deloitte. The search was carried out from their respective start dates till May, 2021 using different keywords for different databases with their unique combinations.
- **Search Strategy:** The search was limited to articles published between 2016 till 2021. Search included only articles published in English language. The keywords in the search include, “**Electronic Medical Record**”, “**Electronic Health Record**”, “**physician**”, “**adoption**”, “**barriers**”, “**EMR**” and “**implementation**” with different combinations in Boolean AND/OR for different databases.



- **Eligibility criteria:** Articles that focus on barriers perceived by physicians were included and the other articles which focus on EMR users other than physicians were excluded from the study. Articles published in English were only included for review. Studies which include implementation and adoption of EMR were included. Literature with policies and implementation strategies by India was studied. The studies which include barriers from a particular region or country outside India were excluded. Articles which include any of the terms, EMR or EHR were taken into consideration with major focus still on EMR.
- **Method of Data Collection:** After the initial screening, 603 articles were excluded as they were not in between the 2016-2021 date of publication and duplicate. Out of the remaining 205 papers, 144 were excluded as they failed to meet the selection criteria (the title, abstract, and keywords). Of the remaining 58 papers, 42 were eliminated after reviewing study context, design, and literature review, hence an absence of significant contribution. Thus, 16 papers that met the inclusion criteria were selected for the final analysis.
- **Data Management and Extraction:** The articles were managed through an MS-excel sheet demarcated by their titles and author's name. The duplicate articles were removed. A PRISMA flow diagram was made for the article's selection procedure. The articles which were eligible were fully reviewed and the findings were compiled using MS-excel sheets into a table. The data extracted was checked again for any error. The data which was extracted includes, author's name, publication date, method of study used, key findings, conclusion, and source of the article.



IDENTIFICATION

ResearchGate (30 potential relevant articles), PubMed (270 potential relevant articles), BMC-Medical (504 potential relevant articles), 1 article from Deloitte website.

SCREENING

Total of 805 potential relevant articles identified

ELIGIBILITY

205 articles for further assessment

603 articles excluded (not in between 2016-2021 and duplicate)

58 relevant articles for further screening

144 articles excluded after reviewing title, abstract and keywords.

INCLUDED

16 relevant articles include for study

42 excluded after reviewing study context and design.

PRISMA Flowchart



Literature Review



S. No.	Authors	Date	Study Method	Key Findings	Conclusion	Source
1.	de Grood, Raissi, Kwon & Santana	1st August 2016	Scoping literature review	11 common barriers were found after reviewing 74 articles which included financial, liability issues, unwillingness of using a new technology and lack of support and training.	The barriers could be resolved by including some incentives at the government level and privacy laws implementation to protect the information. Physicians should be involved in each step of implementation to have their perspective for adoption of such e-health strategies.	PubMed
2.	Palabindala, Pamarthy & Jonnalagadda	26th October 2016		Legal and lawsuit complications can be a barrier if not properly implemented can cause user error. Medical errors can be caused by not providing proper training. The cost of implementation stands out to be the critical factor for failed adoption.	Proper team should be marked before the implementation of EMR so that errors can be avoided. Proper training and regular skill upgrading should be done for physicians.	PubMed
3.	Kruse, Hays, Orav, Palan & Sequist	26th July 2016	Cross-sectional study	Findings showed that around 63% people think that quality care is improved by EMR whereas 76% reported documentation time to be increased and loss of interaction between patient and physician. Productivity loss was one of the findings as well.	These barriers could be handled by providing support to the physicians, help them increase their productivity and develop methods for improving the patient-physician relationship..	PubMed
4.	Jung et al	8th April 2021	An ethnographically inspired interpretive case study.	The major barriers in implementing EHR are low-skill, poor usability, complexity of the system and distrust towards the system. The common facilitators of EHR include well-executed training programs, improved productivity and better quality of care.	Regular education to the EMR users will help in a successful implementation. EMR is expected to increase work productivity and interpersonal collaboration.	PubMed

5.	Kumar, Sundar, & Agarwal	February 2020		Advantages of EMR are multiple like, faster and better documentation with no diagnostic errors but improper infrastructure and financial issues are some reasons for poor implementation of EMR	EMR is a worthy portal for better, easier and efficient care of the patient but it should not affect the traditional patient- physician relationship. A balance should be maintained.	ResearchGate
6.	Janssen, Donnelly, Elder, Pathmanathan & Shaw	6th January 2021	Qualitative Methodology to collect data with interviews.	Pre Implementation Interview findings were, 1. Basic understanding and proper awareness about EMR. 2. Users were in some way engaged in the implementation process. 3. Most find EMR beneficial for data collection while few find interoperability to be an issue. 4. Increase overload was a major concern. Post Implementation Interview findings were, 1. EMR found useful for data completeness. 2. Both negative and positive effects on workload. 3. Problems raised with features and functionality. 4. Learning of data was a concern.	The major barriers for adoption of EMR include lack of technical support, health professional perception that EMR increases work load and learning curve.	ResearchGate
7.	Sharma & Aggarwal	September 2016	Bibliographic learning from many hospitals	As per the CAGR report, in 2020 the global market of EHR would be 25.98 billion dollars. But, adoption rate is low in India as compared to other countries. The major barriers for this are interoperability standard issues, lack of funds and shortage of appropriate government policies.	For improving the condition in India, mandatory use of EHR should be made in hospitals which are large and medium sized with proper standards to be made and incorporated into the system.	ResearchGate



8.	Srivastava et al	October 2016	Reports and documents from various government bodies and analysis of strategies in other countries	It includes the various steps to be taken for adoption of EHR in India as compared to other countries and India's current policies which includes work on ICT infrastructure, policy and regulations, standard and developments with research and development.	Adoption of EMR through following measures:- 1. Creating a secured health network. 2. Exchange of health information safely. 3. Open-source software usage. 4. National policy and privacy laws. 5. R&D and HR development 6. Health IT standards	PubMed
9.	Powel, Ludhar & Ostrovsky	21st April 2017	Survey done on leaders of some hospitals in Chandigarh	Among the organizations which were surveyed in Chandigarh which includes 17 hospitals with EHR systems faced barriers to be around financial and staff matters with others like safety, privacy and interoperability.	This research concludes the presence of EHR in at least one region completely. The EHR system can share information intra-organizationally rather than inter-organizationally. Clinical research is promoted by the data of EHR.	ResearchGate
10.	Newkirchen & Elsner	10 September 2018	Survey	EMR/EHR benefits the physician with reduction in documentation burden but interoperability and workflow burden still remain some problems in adoption of EMR.	To improve the experience of the physicians, measures could be taken like, feedback of the physician must be taken, optimizing the workflow of the complete team, ensuring a training and support team for EHR, progress can be communicated, and always be up-to-date with the latest technology.	Deloitte website
11.	O'Donnell, Kaner, Shaw & Haighton	13th November 2018	Systematic Literature Review	It includes physician's perception about adoption of EMR. The concerns like accessibility, reliability and EMR utility. While some young practitioners showed a positive attitude, the old ones were less skilled technically. Moreover, financial factor and training are common barriers in adoption of EMR	A series of barriers were synthesized by the study as perceived by the primary care physicians while adopting EMR, which could be kept in mind while designing initiatives for implementation. The physicians should be involved in the implementation process for a feasible and user-friendly EMR system.	BMC-Medical

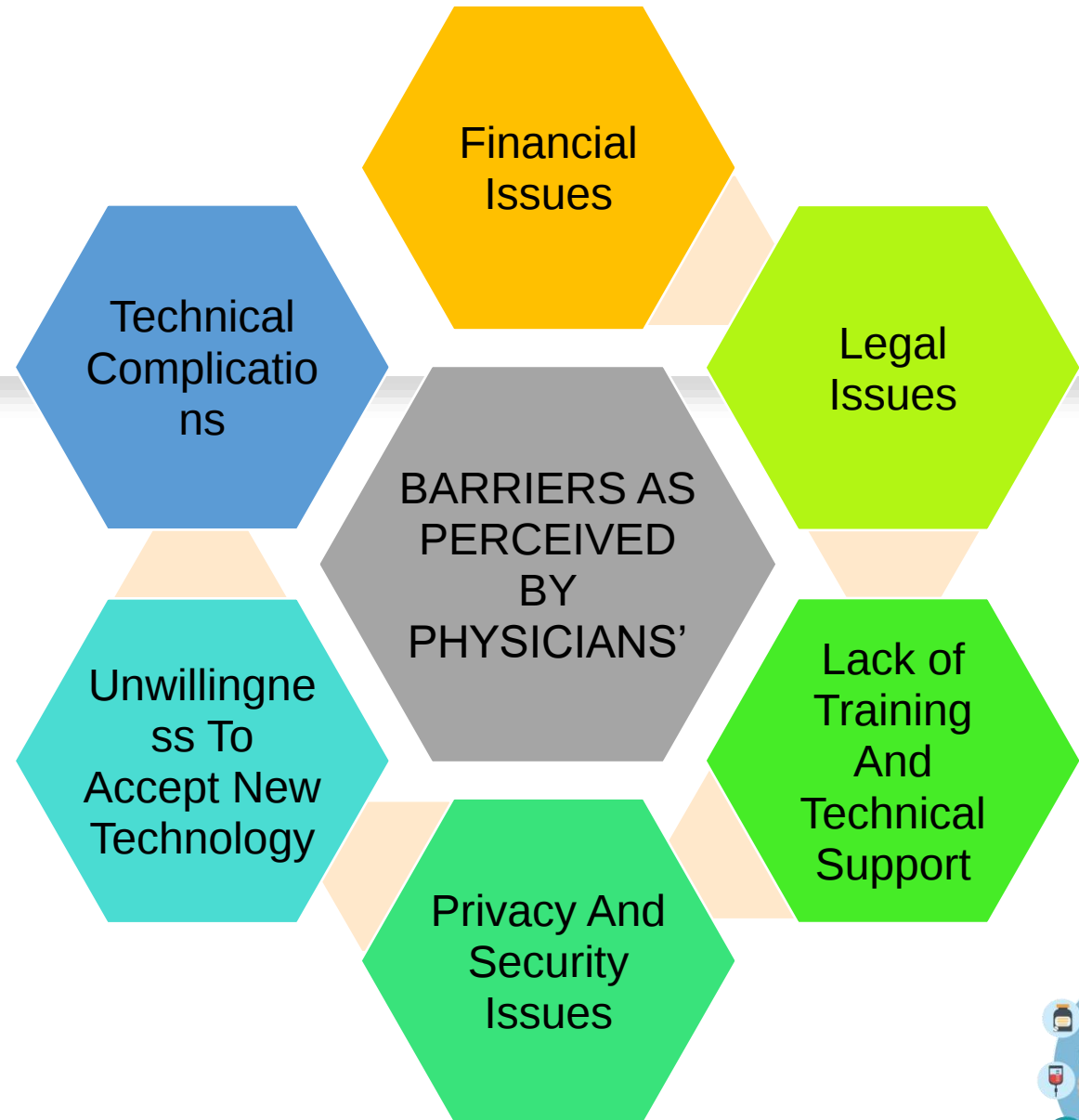


12.	Dutta & Hwang	21st February 2020	A PRIMA compliant systematic review	The study included a total of 25 studies. In these studies, some common barriers were privacy and security concerns, high startup cost, workflow changes, system complexity, lack of reliability and interoperability.	The barriers should be kept in mind while implementing EMR. The policy makers and health professionals should take in consideration all these factors and other factors like standards and vendor issues. All these need to be eliminated for proper implementation of EMR.	PubMed
13.	Singh, Jadhav & Roopashree	2nd June 2020	Cross-sectional Method based on Technology Acceptance Model	Four factors were identified by the survey. They were according to the technology acceptance model. It includes a positive attitude towards EMR, reliability of the system, the level of difficulty in using EMR and adaptability of the system.	EMR is the future to be used in healthcare settings by physicians. To increase the usage hospitals should focus on, improve positive attitude towards EMR, reduce the difficulty level of its usage, selecting a reliable, proven and an adaptable EMR.	PubMed
14.	Nageswararaj , Raman & Basha	10th October 2020	Short Online Survey	According to this study, paper charts are still mostly used in clinical data recording by oncologists rather than EHR systems.	Major obstacles are administrative barriers and cost with lack of awareness and culture as barriers.	ResearchGate
15.	Rahal, Mercer, Kuziemyk & Yaya	19th February 2021	Systematic Literature Review	This study reveals some barriers including EMR's system functionality, lack of awareness, lack of training, lack of technical support, limited resource availability and policies for mature use of EMR.	Factors were identified which influence the EMR implementation. These factors could be eliminated by proper training and support with policies. This would lead to a rightful implementation of EMR.	PubMed
16.	Pai MM, Ganiga, M. Pai & Sinha	January 2021		A cloud based EHR system with error-free capturing and data sharing has been introduced. This would allow managers of hospitals to achieve goals both national and international in public healthcare.	The research objective was to provide a simplified system for patient care in the healthcare systems of India. EHR helps healthcare professionals to have patient's information at any point of time.	ResearchGate



Results

The 16 articles which were included in the present study were systematically reviewed and many common barriers as perceived by the physicians' were noted.



Financial issues and high start-up cost

- It is common in private practises as well as in hospitals as the cost of implementation is high and also due to lack of funds.⁽²⁾⁽³⁾⁽⁶⁾⁽¹²⁾⁽¹³⁾⁽¹⁷⁾

Legal & Lawsuit complications

- It is due to improper implementation which in turn leads to medical malpractice and medical errors.⁽²⁾⁽⁶⁾⁽¹²⁾

Lack of Training and technical support

- It leads to decreased adaptability by the physicians.⁽³⁾⁽⁴⁾⁽⁶⁾⁽⁷⁾⁽⁸⁾

Privacy and security issues

- Patients do not feel safe sharing their personal information for record on computer systems

Technical Complications

- System failure, lack of harmonization, design concerns and complexity of the system thus causing usability issues.⁽³⁾⁽⁴⁾⁽⁵⁾⁽⁶⁾⁽⁷⁾ Interoperability, reliability and standard issues are the most common.⁽⁶⁾⁽⁷⁾⁽¹⁰⁾⁽¹²⁾⁽¹⁴⁾⁽¹⁷⁾



Other Barriers

- Technical limitations which makes it difficult to use and distrust the system.⁽³⁾⁽⁴⁾⁽⁵⁾⁽⁷⁾
- The time which is required to enter a patient's medical record is a major concern for clinicians as the documentation time increases which makes it time consuming and causes work overload and loss of productivity.⁽³⁾⁽⁴⁾⁽⁶⁾⁽⁷⁾⁽¹⁰⁾⁽¹¹⁾
- Lack of computer literacy and low EMR functionality awareness with steep learning curve.⁽⁵⁾⁽⁸⁾⁽¹²⁾
- Use of EMR/EHR causes poor patient-physician interaction as most time is consumed in entering data in the system.⁽³⁾⁽⁴⁾
- Often, the feedback of physicians on EMR/EHR system is also overlooked.⁽¹⁰⁾
- Lack of standards and incentives with shortage of government policies.⁽⁶⁾⁽¹²⁾



EMR/EHR is very beneficial for the advancement of the healthcare system in India. Advantages of Electronic Medical Record are :-

- It is a faster documentation system.
- It has quicker integration of various details in health records.
- It avoids diagnostic errors with better, easier and efficient patient care.⁽¹⁵⁾
- It decreases malpractices as review can be done easily.
- It increases follow up results and decreases medication errors
- It improves quality of care.⁽²⁾⁽⁴⁾⁽¹¹⁾



Strategies for Adoption of EMR System in India includes:-

- ICT infrastructure with a health net which is nationally secure, health network storage and exchange infrastructure and a free and open source EMR.
- Policy and regulations which includes National Health IT policy, protection of privacy of health information while sharing and using and liability of technical failures.
- Standards and interoperability with an agency for health IT standards, using of a unique patient identity, support for standard adoption and various guidelines for health IT solutions.
- Research, development and education in health IT, human resource development in health IT, development of online application software and international collaboration.⁽⁹⁾



Suggestions for Implementation of EMR in India:-

- Proper implementation with prior meeting with the vendor and regular system upgrading.⁽²⁾
- Customizable EMR with proper feedback from the physicians to be introduced.
- An adaptable EMR system particularly made as per the requirements and specifications of physicians.⁽⁶⁾⁽⁷⁾
- Proper training and upskilling of the users by the vendors to reduce risk of errors.⁽²⁾⁽¹¹⁾⁽¹⁴⁾ This will decrease errors while entering patient information and improve productivity.
- Government level pay incentives and privacy laws overcome cost and privacy issues.⁽³⁾
- Proper training to be given to physicians for using EMR/EHR.⁽¹¹⁾
- EMR/EHR should be made compulsory for the big and average sized hospitals.⁽¹²⁾



Limitations

This present study has some limitations:-

- It includes the small number of studies reviewed after exclusion. This could be due to the reason that our study only includes physicians' perspective on barriers and no other healthcare workers or EMR users.
- This study is based completely on the review of literature which have different objectives and results which might not even match with the current study.



Conclusion

- The adoption rate of EMR is low despite having so many advantages in patient care. The most common barriers include, financial, technical, legal, privacy and unacceptance of new technology by the physicians.
- The policy makers and government should make standards and guidelines to eliminate such barriers for proper implementation of the EMR/EHR system.
- National policies are required for the regulation of problems. More technologies like web based or cloud based solutions can be used for implementation of EMR.
- EMR/EHR is the future of quality medical care of the patient and thus from the initial stage only, physicians should be involved for proper adoption along with implementation of the system.



Suggestions

- Future studies can include barriers perceived by other healthcare workers using EMR as well to have an in-depth knowledge on the subject for a smooth and proper implementation of EMR.
- Studies could be done using a cross-sectional method with surveys in hospitals using EMR in a region or state and analysing the barriers faced by them. This could help in future implementation in other hospitals and to improve the adoption rate.



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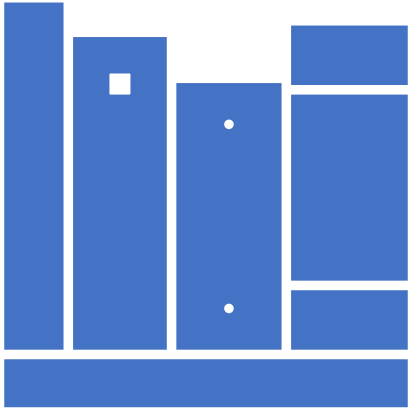


Annexure

The various EMR/EHR providers and hospitals using them in India are⁽¹²⁾ :-

Hospitals In India Using EMR	EMR/EHR providing software company
AIMS, Coimbatore	IBA Health
Apollo Hospital, Chennai	Veopro
Artemis Health Sciences, Gurgaon	Siemens
Christian Medical College, Vellore	Karishma Software
Fortis Hospital, Mohali & Delhi	Sobha Renaissance IT Pvt. Ltd.
Manipal Hospital, Bangalore	21st Century healthcare solutions
Max Devki Devi Hospital, Delhi	Soft link International
P D Hinduja Hospital, Mumbai	Prognosys
Ruby Hall Clinic, Pune	Srishti Software
PGIMER, Chandigarh	CDAC
Sri Sathya Institute of Higher Medical Sciences, Bangalore	GE Healthcare





Thank You
