RESEARCH ARTICLE

IMPACT OF ELECTRONIC MEDICAL RECORDS IN IMPROVING THE QUALITY OF HEALTHCARE SERVICES PROVIDED IN PAKISTANI HOSPITALS

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The electronic record software has become an integral part of the healthcare system in improving patient care delivery. This study was carried out to study the effectiveness of electronic medication record and to evaluate the consent of patients and doctors with the perceived quality of care by using the software. This study has also determined the preference of patients as well as doctors towards the record management by using software based method or paper based medical records. The results of this study showed positive relationship between service quality and electronic medical records. The most immediate benefit of electronic medical records is time management and immediate online access at any time. It is concluded that the implementation of electronic medical record system is necessary for the assurance of high quality care.

Key words: Electronic medical records, implementation, service quality, hospital, healthcare systems, benefits.

1. INTRODUCTION
Healthcare system is one of the most noteworthy and important sector all over the world. In Pakistan, hospitals are divided into two sectors, i.e. public and private. Almost 70% of the population avails the facilities provided by private sectors as the public setups are not up to the standard with respect to the quality and infrastructure. The prime responsibility of healthcare industry is to provide quality services that ultimately lead to the patient’s satisfaction and compliance. Healthcare sectors cannot survive if they are unable to meet the requirements of the patients that can only be achieved by enhancing the quality of services they supply. The quality services provided by the hospitals have proved to be a key factor in assuring the stability of a healthcare system. In recent years, it has become a greatest challenge for the hospitals to fulfill the quality needs of a patient. Patients are the customers who have pre-established the quality service standards. Quality is influenced by many factors but one of the most important elements is the health information technology.

As medical care is getting complexed with time, physicians need new technology to help them cope-up with this change. Most of the countries like Europe and USA have increasingly employed an electronic medical record (EMR) system with the assurance that it can help to improve healthcare quality¹. The digital medical records allow the documentation of patient’s medical data which can be processed and used to improve healthcare delivery. Information system is a response to the change in healthcare system. The EMR is a good example of this response. EMRs will improve caregiver’s decisions and patient’s outcomes. Once patient has experienced the benefits of this technology, they will demand nothing less from their providers. Hundred thousands of physicians have already seen these benefits in their clinical practice². The EMRs used in keeping patients data discussed in this paper underwent a rapid evolutionary change because of this reason. Firstly, it helps to improve the healthcare delivery and also to increase collaboration between physicians. The existing system which was based on paper documentation could not support improvement of proper healthcare. Electronic health records (EHR) promise to improve healthcare delivery, efficiency, quality and safety. However, these improvements will occur only if healthcare practitioners have access to the key functions they

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expect and use them regularly in their practices\textsuperscript{3}.

In recent years, EHRs have been implemented by an ever increasing number of hospitals around the world\textsuperscript{4}. The idea of recording patients information on electronic data instead of paper has been around since the late 1960s, when Larry Weed introduced the concept of the problem Oriented Medical Records (OMRs) into medical practice. Weed’s innovation was to generate a record that would allow third party to independently verify the diagnosis\textsuperscript{5}. The benefits of EHRs include the instantaneous availability of medical records\textsuperscript{6-8}, the elimination of illegible notes\textsuperscript{6,8-10}. However, unfortunately EMR is not properly implemented in underdeveloped countries due to some challenges. The implementation of EMR system has become mandatory all over the world because of increased death rates due to lack of availability of medical history and false decision making. The EMR system plays a significant role in sorting out such errors. In this study, the effectiveness of EMRs to improve healthcare delivery has been investigated.

Developing countries like Pakistan, where there is a very little awareness of EMR system and many hospitals are still using manual management of documentation, must understand the benefits of EMR system. The patients are hugely suffered by paper based documentation because of absence of instant availability of their medical data. Furthermore, the patient reports are often misplaced; the old record is lost due to unfortunate accidents and so on. Most of the hospitals in Pakistan are suffering with such mismanagement issues. It has affected the performance of the hospitals and fails to meet the quality standards. Moreover, manual management of records is the reason for sufficient number of human errors that eventually leads to increased mortality rates. The rapidly changing medical system with increased complexity has urged the hospital managements to design a software and get their physicians and other healthcare professionals trained on that system. This will ultimately make their work more easy and efficient. The aim of using EMR system is to improve medical care, reduce healthcare cost and increase the collaboration between healthcare professionals. There are strong evidences that computerized physician order entry (CPOE) reduce medical errors\textsuperscript{11}. In order to fulfill the increased efficiency requirements, the implementation of EMR has become the basic necessity of every hospital. Health information technology, such as sophisticated electronic health records, has the potential to improve health care\textsuperscript{12-14}. To help understand this better; the focus of this study is on the research based on examining the effectiveness or benefits of EMR and considering its impact on the improvement of patients care delivery.

2. METHOD
This study was based on the evaluation of the role of EMR in the improvement of patient care. A number of data collection methods were employed, including questionnaires, interviews and literature review. The fieldwork lasted for months from October 2015 to January 2016. The subjects included in the present study were doctors and students of multiple hospitals and universities, who belong to different medical professions from Pakistan. Data was collected by different individuals. All subjects were made to fill questionnaires containing 10 questions with multiple options. Questionnaire was based on the close ended questions. In the questionnaire, the subjects were asked about their concerned with the use, challenge, importance and implementation of EMR. The following research questions were included in the questionnaire with the options Strongly Agree, Agree, Neutral, Disagree, Strongly Disagree:

i. EMR has improved the patient relations with doctors to a greater extent.

ii. More serious mistakes can be avoided by using EMR which contributes towards high quality services of healthcare.

iii. EMR provides more authentic and secured services than manual records.

iv. When a lot of work needs to be done quickly EMR/EHR system is faster to manage than paper documentation.
v. The implementation of EMR system is a necessity for enhancing quality and efficiency of services.
vi. One needs to be an expert of computer to use EMR system due to its complexity.
vii. Patient receives more productive outcomes by availing EMR services.
viii. The EMR system helps in more improved decision making.
ix. Improved performance of clinical work is expected while using EMR.
x. Data can be entered once and then used in multiple places through EMR system.

A comprehensive review was undertaken to identify the benefits and implementation of EMR. The information of the databases were obtained from, Web of Knowledge, PubMed, and Cochrane Library. Relevant references in the selected articles were also analyzed. Search terms included Electronic Medical Record (and synonyms), importance, implementation, and hospital (and synonyms). Articles had to meet the following requirements: (1) written in English, (2) full text available online, (3) based on primary empirical data, (4) focused on hospital-wide EMR importance and implementation and (5) satisfying established quality criteria. Articles were selected, assessed for quality and the data was extracted according to preset protocols. Interviews were also conducted of medical students and doctors to know their preference and knowledge about EMR. During the interview they were asked questions regarding its benefits and implementation in the hospital setup.

3. RESULTS AND DISCUSSION
Total 32 questionnaires were successfully obtained, 12 from the students and 20 from the doctors. Initially, the hypothesis was confirmed that there is a positive relationship between EMR and quality care services. The main research findings of this study are discussed according to the research questions. The findings are also discussed in relation to previous studies reviewed in the literature. The main issue addressed in this research is the relationship between EMR and service quality in healthcare systems. According to the descriptive analysis in this study, a highly significant correlation between EMR system and quality care services is found.

According to the findings of this study, it is suggested that EMR system is an excellent way to store patient’s data which in return enhances the patient’s satisfaction towards the services. Improving service quality to the mark can be achieved by implementing the usage of EMR in hospitals which makes things easier for both doctors and the patients. The relationship between EMR and quality of healthcare services were analyzed by regression analysis. EMR was significantly associated to the increment of quality of healthcare services because the p value is less than 0.05. Findings of this study showed that quality control is directly related to EMR along with other factors but the implementation of it is not that common because of numerous barriers that include resistance from staff to bring a change in their routine, financial barriers and many more.

Technological developments in services such as internet and cellular technologies have improved rapidly in recent years, which have led to the emergence of new ways of managing information. Together these technologies have the potential to transform numerous aspects of information management in healthcare system i.e. from the documentation of health information to its storage. Such technologies are exposing individuals to the improvements in healthcare and generating positive attitudes toward managing their own medical information. It is very logical to say that EMR plays a promising role for the betterment of both primary and secondary care in hospitals.

The EMR system has the ability to alter practices of medical institutes. It has the potential to increase the standards of the services by helping them in making decisions by eliminating the chances of causing errors in medical reports. The most important benefit of this system is saving time from manual recording and arrangement of patient’s data. With the help of EMR system, patient’s data can be traced by just putting patient’s ID number on the computer.
Implementation of EMR system is of basic necessity for all medical institutions for enhancing the quality care of services provided to the patients. The characteristics for any EMR system should include a lifelong comprehensive patient record, immediate access to the patient information as needed, health management and information tools, privacy and security of the patient’s information and the ability for the owner to control access to these records. EMR system offers number of multiple benefits as compared to the manual documentation. It is more easier to operate and manage patient’s records but unfortunately it has not been adopted by all hospitals yet due to some challenges like unavailability of funds, unawareness of its benefits, inability to understand how to operate the system, etc. It can help to reduce death rates by giving the accurate information regarding patient’s history and ultimately assisting in diagnosing the disease and giving warnings about the allergies and sharing of data in case of emergencies.

EMR was categorized as a provider-owned and maintained database, which provides patients with read only information such as lab results and disease management information, patient-owned software that allows the patient to enter and organize their own information and a portable inter-operable digital file where clinical information can be inserted and transferred. These files can be stored on USB storage devices, cellular phones, or smart cards, allowing for portability and exchangeability of health information according to consumer discretion. Besides these, some EMR also provide insurance information, tele-medical events, data and even genetic code map.

The findings of this study show that the research objective was achieved and the research questions were answered. This research contributed towards the academic topic as well as business enhancement. The association between service quality and EMR will assist hospital management to understand the significance of implementation of EMR in hospitals and it will help to increase the awareness of EMR in hospitals of Pakistan. Consequently the findings of this study will be useful to the managing department of hospitals with respect to how to deal with the management of medical records by getting rid of loads of papers and how to keep the confidentiality of records in an easier and feasible way. At the present time, quality research has become essential as most of the healthcare institutes are currently trying to improve their services which will in return improve the patient’s faith in medical staff.

4. CONCLUSION
The most immediate benefit of EMR is time saving. There are many other benefits like accurate medication lists, legible notes and prescriptions, immediately available charts, decreased chart pulls, lower transcription costs, reduction in medical errors and improvement in quality care and standards. Institutional commitment, flexible planning interspersed with EMR interventions, realistic implementation goals and explicit support for the constantly changing environment will be necessary to broaden the diffusion and acceptance of EMR.

5. ACKNOWLEDGEMENT
I would like to convey my special thanks and gratitude to my supervisor Prof. Dr. Hikmet Secim for his valuable support and priceless guidance during the whole process of writing this research project. His professional advises helped me easily to withstand with research of my project.

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