REVIEW ARTICLE

Challenges in the use Electronic Medical Records in Middle Eastern Countries: A Narrative Review

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ABSTRACT

Electronic Medical Records (EMRs) have great value in healthcare, as they enhance healthcare quality, decrease costs, optimize patient safety and health care research. Worldwide and particularly in the Middle Eastern countries have pushed for usage and implement EMR systems. However, there were some obstacles and challenges toward implementation of the EMR system. This review aims to look at the challenges and constraints of using and adopting EMR in Middle Eastern countries. Electronic databases of PubMed, country reports, newspaper, magazine articles, and hospital reports between 2008 to 2021 were used. Most common challenges highlighted were high cost of EMR implementation, lack of training, insufficient information technology personnel support, poor acceptance of new technology, confidentiality, and privacy concerns. Understanding the hurdles of using EMR technology in health care setting is essential for decision makers to focus on economic and human factors challenges to enhance the use and acceptance of EMR systems.
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INTRODUCTION

Many types of electronic health records (EMR) have been introduced, developed, and adopted as a result of the improvements of information technology in the healthcare organizations over the last view years (1). Many institutions still in the process of implementing a nationwide electronic medical record, while others have already implemented EMRs (2).

Electronic medical records include diagnoses, prescriptions, tests, allergies, vaccines, treatment plans and other important patient information that assist healthcare providers to make suggestions about the patient's plan of care (3). Upon implementation of EMR, a lot of benefits have been reported like less inaccuracies, faster care, ability to follow the progress of the results over the time in treatment and diagnostics, health data security and privacy were improved (4).

The first electronic medical record (EMR) was created in 1972 by the Regenstreif Institute in the United States, and it was hailed as a significant improvement in medical practice at the time. The uptake, on the other hand, was low, with cost being a key stumbling block (5). Electronic health records are being used in hospitals in Middle Eastern countries to improve quality of care.

POTENTIAL BENEFITS OF EMR IMPLEMENTATION IN THE MIDDLE EAST

Countless benefits of implementation of EMR such reducing errors (6), improve healthcare quality upon used correctly (7) and improving the communication among health care professionals (3). Electronic medical record offers benefits to healthcare professionals for viewing, and retrieving important patient information, medical history, diagnostics results, treatment regimens, and all related patient information (3,8). Also, EMR data can be used for best practices, conduct research, provides useful information and feedback on the quality of their care (9).

Moreover, EMRs allows practitioners to visit a larger number of patients by providing greater access to full patient histories that include clinical data, potentially saving time searching for findings and reports (10).
The benefits of EMR on health outcomes has been extensively studied worldwide. Therefore, studying the barriers of using electronic medical records in health care sector across Middle Eastern Countries is important to understand the challenges and issues related to health information system.

METHOD

A narrative review of the challenges in the use Electronic Medical Records in Middle Eastern Countries was conducted. Online databases and resources such as PubMed, Google Scholar Official Country Reports, Newspaper, Government Agency, and Hospital Reports were used to searched to identify the relevant literature and articles on challenges in the use of Electronic Medical Records in Middle Eastern countries. Keywords used for this search were "Electronic Medical Records", "EMR", "Middle Eastern", "Electronic Medical Records and Middle Eastern", "EMR and Middle Eastern".

Inclusion criteria for selection were studies focused on Middle Eastern Countries described the status, issues, barriers of electronic medical records implementation, studies written in English language and availability of published articles and resources between 2008 and 2021. Studies were included different middle eastern countries include Saudi Arabia, Bahrain, Oman, UAE, Jordan, and Qatar. This selection was chosen based on the availability of numerous published articles and resources.

The summarized challenges from literature review were based on the experience of health care provider and organizations toward the implementation of electronic medical records experience. The findings from these sources were reviewed, analyzed, and summarized according to literary analysis. Besides that, two experts participated in the reviewing and analyzing the literary analysis. The gathered evidence from the databases and resources included the qualitative and quantitative information. This review presents challenges of the implementation of electronic medical records to EMR in selected Middle Eastern countries.

DISCUSSION

A total of 33 articles and reports were included in this narrative review related to use of Electronic Medical Records in Middle Eastern Countries. A detailed review and inspection of the included full text articles was conducted based on the inclusion and exclusion criteria. Each healthcare organizations facing challenges and constraints related to the implementation of EMR systems was shown as below based on the eligible published paper and reports:

ELECTRONIC MEDICAL RECORDS IN SAUDI ARABIA

Saudi Arabia's government implemented electronic medical records (EMRs) in select health-care facilities. However, significant roadblocks remain in the way of this ambitious objective, including some health care workers' negative sentiments concerning EMR systems. Poor computer literacy, a lack of system customization to meet hospital demands, and a lack of assistance and training from information technology (IT) employees are among the other roadblocks. Identifying and removing these roadblocks is critical for the successful implementation of EMR systems in all health-care settings (10).

Saudi Arabia is becoming increasingly concerned about the lack of use of electronic health records (EMR) systems in the healthcare industry. Many hospitals and institutions have already begun the process of implementing EMR systems (11). While EMR adoption in Ministry of Health (MOH) hospitals is progressing slowly, numerous information systems in district directories and key hospitals are operational. These systems, however, are not connected to each other or integrated with other healthcare sectors. Although there is no reliable data on the amount of EMR adoption in Saudi Arabia, the following was discovered at 19 MOH facilities in the Eastern Province: Only three hospitals out of a total of 19 have implemented HER (12).

Additionally, the systems used are equipped with decision support tools and clinical documentations for generating and storing lists of common patient-related health concerns, as well as documenting patient discharge information. However, the study found that the hospitals underutilized certain of the EMR system's functionalities, such as physician or patient access to EMRs from outside the facility (13).

Saudi Arabia like other developing regional countries still has a gap between planning and implementing successfully of Electronic Medical Record (14). However, the barriers may not be the technology availability to medical institutions rather than the lack of technical support for the systems during and after the implementation (15), likewise, the cost of transitioning from traditional paper based medical records to an electronic system and lack of health care finance for some situations to pay the costs of adopting, managing, and training of end users on how to operate such systems. Furthermore, lack of technical expertise, technical and computer skills of hospital staff, primarily the computer skills of doctors, nursing staff and technicians, and the lack of data processing facilities was addressed for the barriers to EMR implementation (16).

Furthermore, several barriers were reported in different articles toward the implementation of EMR in Saudi Arabia health care organizations which include the high cost to using and adoption EMR system, and software complexity and unable to sustain maintenance of EMR system (17), in addition, lack of knowledge and skill to use technology amongst health workers affect in delaying the fast implementing of the system Also, staff attitude and resistance to accept using the EMR system was one of the obstacles to EHR operation in some Saudi hospitals (18). Moreover, staff have concern about maintaining privacy and confidentiality of patient

information in the EMR system because all personals have access to the EMR system, and no guarantee of security of patient information like paper-based aspect (19).

ELECTRONIC MEDICAL RECORDS IN BAHRAIN

Bahrain hospitals have implemented extensive or basic electronic functioning of EMR almost 55.6%. with 42% of decision support features in EMR (20). However, Bahrain healthcare system has unique problems in making the switch to EMR due to inequitable access to healthcare, fast population expansion, and shortage of medical personnel, and rising chronic disease rates (21). Cost and financial barriers (such as funding) and lack of technical assistance was reported as one of the barriers to implement EMR (22) similarly to a report from Saudi Arabia. Further, lack of training, usage challenges, lack of time and training, cultural concerns, legal and ethical disputes, individual resistance, and expectations are the key barriers to EMR adoption in Bahrain.

Results from the previous studies conducted in Bahrain revealed several barriers toward implementation of EMR in different domain like human barriers (lack of staff beliefs and knowledge), professional barriers which are related to nature of healthcare staff jobs, technical barriers, such as those relating to computers and information technology, organizational barriers such as lack of hospital administration support, and legal and regulatory barrier relating to laws, regulations, and legislation (22,23).

Due to that, special considerations must be given to healthcare worker attitudes on EMR adoption and healthcare professionals must understand that implementing any EHR system is a complicated process that necessitates various interventions and collaboration to establish an effective EMR system (20).

ELECTRONIC MEDICAL RECORDS IN OMAN

Oman has developed an integrated electronic hospital information system in its government-run health-care facilities. The approach was initially adopted at basic health care centers before being expanded to hospitals. Physician satisfaction and use of this new technology in a hospital context are influenced by a variety of factors, according to survey findings. The results of the survey highlight areas for improvement. Specific concerns about patient confidentiality, as well as patient care quality improvement, are explored (24).

Hindrances towards the implementation of EMR systems was addressed such as hardware limitations, integrated systems issue with other delivery system, maintenance issue, confidentiality staff concern like to the concern was reported in Saudi Arabia (25). High cost of EMR is universal barriers to the implementation of EMR; this has been reported as well in various studies across Saudi Arabi, Bahrain and Oman (16,22, 25). Other barriers were reported included the struggle of adding and archiving the previous paper-based patient information to the EMR system, data storage issues, how to safeguard the information security, and the process of retrieve information is not disruptive (26).

A further barrier is that inadequate training of health care providers about proper using of EMR system prevents them to use the system successfully and how to safeguard the information security implemented (27) like Bahrain barriers (22,23). Additionally, lack of end user engagement and involvement during system implementation were reported as barrier which led to affect the following patient care process workflow (27). Other challenges have been reported concerned about breaching patient confidentiality and system downtime issue that affecting patient care and documentation delay (28). These barriers were similar to the Saudi Arabia reports, which reported the confidentiality and maintenance barriers (18,19).

ELECTRONIC MEDICAL RECORDS IN UNITED ARAB EMIRATE

Health services in the United Arab Emirates (UAE) have advanced dramatically during the last 40 years. Innovation and transformation, as well as investment in a solid e-Health infrastructure with a single transportable electronic patient record, are essential to ensure they continue to satisfy the demands of the public (7).

Numerous obstacles were summarized regarding the implementation of EMR in UAE such as insufficient of computer knowledge and training, lengthy time required for documentation, and confidentiality matter regarding electronic patient files access, since anyone who has authority to the system might open any file (29). In addition, there was several other hindrance reported by health providers, lack of faith in the effectiveness of the EMR system for patients, insufficient technology skills, poor training, and absence of management support (30).

Other barriers reported were the unfamiliarity with the technology system, struggle in accessing data, improper viewing and searching practice, and lack of advance tools for navigation in medical records information and data (31). Additionally, absence of integration among Health Information System (HIS), and deficiency of knowing the provider needs has been proven to be an obstacle to EMR deployment in the UAE (32). A similar finding was reported in Oman where both barriers prevented health care provider from using EMR (25,27).

A study showed that 54% of participants indicated that the organizational impediments to EMR are included in the list of EMR implementation barriers (33). These results were similar to those of an investigation in

Bahrain (23).

ELECTRONIC HEALTH RECORDS IN JORDAN

The usage of EMR in Jordan hospitals improves clarity of clinical documentation and scientific decision support among health care providers (34). However, the limited resources and financial issues avoiding the facility to accomplish the essential e-health systems. Likewise, absence of standards from health providers, literacy problems among different users and sharing information issues was defined as barrier in the implementation of EMR in Jordan (35).

Additionally, high cost of obtaining EMR was the major barriers in Jordan (36). This finding was reported in the Saudi Arabia, Bahrain, and Oman studies (16,22, 25). However, there is no barrier addressed related to cost in UAE and Qatar. Moreover, lack of knowledge and shortage of information technology professionals was reported as barriers to EMR implementation in Jordan (36) as reported previously in Saudi Arabia, Bahrain, Oman, UAE.

Another area of challenges identified as major challenges include medical specialists have expressed worries about the harmful impact patient care and the possibility for disruption during EMR implementation, spent much time looking for information led to less time spent on direct patient, lacking training, and lack of IT assistance (37).

ELECTRONIC HEALTH RECORDS IN QATAR

Electronic medical record system has been implemented across the different organizations in Qatar in 2016 (38), where e-health program use of digital technology and telecommunications to support health improvement. Designing incentives and penalties also encouraged stakeholders to generate value requires a thorough grasp of EMR program advantages. It established the minimum requirements, standards, and capabilities of these new EMR systems must meet to join the national e-health system in the country (39). EMR has challenges such as interoperability concerns like patient has multiple medical records (40), lengthy time spent for documentation, and insufficient awareness in using EMR system (41).

There are additional barriers reported such as lack of awareness of Qatari population about the upcoming changes in their healthcare experiences, and public lose confidence of EMR project. Financial incentives for healthcare providers proved to be an effective method towards raising the EHR adoption. Lack of knowledgeable and experienced technical staff and healthcare leaders is also a barrier. So, to make EMR an everyday tool for doctors, nurses, patients, and public authorities, it is necessary to implement services based on the interests of the healthcare providers and society (42).

Generally, based on review articles, the barriers of implementation of Electronic Medical Record implementation are summarized into various aspects: (a) Human barrier such as time constrain, knowledge deficiency, unavailability, and lack of experienced staff; (b) Attitudes & beliefs barriers such as providers not accepting the changes, and poor perceptions and feelings. (c) Financial concerns such as budget, not allocated and inadequate financial support. (d) Technical support such as system not integrated, and system customizations issues. (e) Ethical and cultural concerns such as maintaining patient confidentiality, and unavailability of clear regulations. (e) Training and skill barriers such as insufficient training, and unfamiliarity with computers (Table I).

CONCLUSION

The result of the study review reported the advantages of electronic health records (EHRs) implementation in the healthcare organization in the Middle East. This review also explored the issues and challenges of health care institutions and providers during the implementation of Electronic Medical Records from different middle east countries. The healthcare organizations need establish several measures and strategies toward the challenges to enhance and facilitate the implementation of electronic medical records such as designed plan and strategy to adopt and deploy the new system, allocate budget, offer structured training, sustain technical support, introduce the concept, and additional research in this subject is recommended. The value of this measures will lead to enhance and improve of patient care and optimize patient safety thereafter.

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Table I: Summarized listed barriers

Domain Barriers	Common issues and Challenges
Human factors	Shortage of information technology professionals
	Lack of experienced technical staff
	Lack of experience in using computers among health workers
	Absence of staff interest
	Barrier to accepts change of implementing EMR
	Individual resistance to changes
	Not given importance of era of informatics
Attitudes & Beliefs	Adopting a new HIS result in changes to routine activities, and increased efforts which is unwelcome from healthcare practitioners
	Take longer time to document health data and information
	Time required to adopt the Health Information System (HIS) and replace the existing paper-based system
	Raise feeling of increasing the chance of error
	Due to the nature of healthcare jobs such as: Lack of time and training
	Difficult collaboration to establish an effective EMR
	Poor perception related to acceptability and utilization of EMR system
	Opinion of providers about possibility for disruption patient care
	Feeling unsafe of missing some important notes with EMR
	Less time spent on direct patient care due to much time spent by healthcare professionals looking for information in EMR system
Financial concerns	High cost of obtaining and establishing EMR system
	Insufficient finance in some healthcare situations
	Funding and budgeting issues
	Cost of EMR adaption is high
Technical support	lack of system customization to meet hospital demands
	Lack of technical support for systems during and after their implementation
	Barriers relating to computers and information technology, support, and experience
	Lack the ability or consuming time to obtain test and investigation results
	Different system used, and those systems are not connected to each other or not integrated with other healthcare sectors.
	Taken long time to implement full EMR not meet healthcare providers' expectations
	Inequitable access to healthcare, fast population expansion, a shortage of medical personnel
	Using basic EMR systems functionality
Ethical and cultural	Concerns about maintain patient information confidentiality
	Legal and Regulatory Barriers such as: relating to laws, regulations, and legislation not in place or not defined clearly
	Not guarantee patient anonymity
	Underutilized certain of the EMR functionalities, such as physician or patient access to EMRs from outside the facility
	lack of population awareness about the upcoming changes in their healthcare
Training and skill	Lack of assisting staff in adopting the technologies
	Poor computer literacy
	Lack of skill and familiarity with computers
	Insufficient training from information technology (IT) employees
	Lack of understanding about forthcoming changes
	Lack of knowledgeable
	EMR implementation was not based on the interests of the healthcare providers

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