Barriers of Utilizing an Electronic Health System in Sub-Saharan Africa

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Review Article

ABSTRACT

Objective: Accessing data information of patients has been a challenge for years due to the use of paper recording, some essential data are either lost or mistakenly thrown away and cannot be retrieved. This is a major public health concern to ensure the effective provision of healthcare to patients. The purpose of the study focuses on the barriers to utilizing an electronic health system in sub-Saharan Africa.

Methods: A systematic review was carried out with the aid of online research journal websites as well as other in-context articles. While conducting this study, the keywords in the search query were directed toward the barriers to the implementation of an electronic health system in Sub-Saharan Africa. Areas noted in relation to this study were the use of electronic health systems among health professionals. Therefore, there was a linkage of papers pointing out the barriers hindering the implementation of the e-health system.

Results: According to Kemper and other researchers more than half (58.1%) of the physicians without an electronic medical system doubt that an electronic medical system can improve patient care or clinical outcomes. In Shachak's research, where this issue was considered, 92% of physicians felt electronic medical system use did disturb communication with their patients.

Conclusion: The findings of this study can be used as an overview of barriers that physicians might possibly see in the electronic medical system implementation process and, as such, could be valuable for electronic medical system policymakers and implementers. The study indicates that policymakers should be more aware of the reality that removing technical, financial, and legal barriers is not sufficient to ensure the realization of the promises of electronic medical system.

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1. INTRODUCTION

Those who reside in sub-Saharan Africa, where there are comparatively few resources, are subjected to an especially heavy load of illness-related suffering. According to figures provided by the World Health Organization (WHO), the disease burden in sub-Saharan Africa amounts to 27 percent of the globe's total, which is roughly equivalent to 12 percent of the population of the whole world [1].In order to make a poor scenario even worse, there is a serious absence of health information technology that is definitely essential in order to give better care to patients in the same region that is plagued by disease [2]. It is not feasible to provide a patient with appropriate medical care without having up-to-date and correct information about that patient.

Medical professionals and others working in disciplines connected to medicine need easy access to data of a high grade so that they may make accurate clinical assessments. The unfortunate reality is that nobody is meeting these standards in an appropriate manner [3]. Patient therapy and clinical research, in addition to the quality of reporting and publishing, are all significantly affected as a result of the lack of trustworthy data [4]. Recent discussions spoken in public have shed light on how vitally necessary it is for nations located in sub-Saharan Africa to establish trustworthy health information systems.

A number of countries are seriously contemplating the installation of electronic health systems as a consequence of the broad recognition that improved health information technology is important to the provision of higher-quality care at lower costs [5]. The International Organization for Standardization (ISO) describes "a digital repository of patient data that is held and exchanged securely and that is accessible by numerous authorized users as the definition of an electronic health system." Its major goal is to create continuous, efficient, and high-quality integrated health care by bringing together information from both the past and the present. This is how it will accomplish this goal [6].

An electronic health system is a digital record of health information about an individual that is created by licensed clinicians and staff from a single organization who are actively involved in the health and treatment of that individual, as stated by the National Alliance for Health Information Technology. An electronic health system is defined as a digital record of health information about an individual. After then, the individual's health care provider(s) will get the information from the electronic health system [7]. It is common knowledge at this point that an efficient healthcare information system must incorporate electronic records as one of its primary structural components in order to guarantee favorable results for patients' health.

Multiple studies have indicated that the adoption of an electronic health system may aid medical personnel in reducing the number of instances of medical blunders, enhancing care coordination, boosting patient safety and quality, and cutting overall costs [8]. The use of data is becoming more significant across a wide range of industries, one of which is the healthcare industry. To be able to make decisions that are well-informed, as well as debate and document patient care plans, members of the healthcare staff need to have access to the right data and information management technology [9].

The European Commission (EC) could stand to gain from the implementation of an electronic healthcare system [10]. It has been shown that electronic health systems increase patient care as well as customer happiness, while at the same time reducing the amount of time staff members spend on paper-based administrative duties and the number of missing folders [11]. It has only been documented on a handful of occasions when electronic health systems have been used in emergency care settings in low- and middle-income countries. Due to the fact that it is limited to the documentation required by antiretroviral treatment clinics or to the documentation of a more general nature in some health institutions, the use of electronic health systems in Sub-Saharan Africa has remained primitive for a considerable amount of time. This has caused the use of these systems to remain primitive for a considerable amount of time [12,13].

In Malawi, an increase in the quality of medical treatment has been attributed to the implementation of electronic health systems, which have been used, for example, in the administration of antiretroviral medicine [14].

According to the conclusions of recent research, the use of electronic health systems in

Cameroon may be beneficial to the execution of public health policies as well as the provision of healthcare [15]. According to the World Bank, both Malawi and Cameroon are examples of countries that fall within the category of low-income countries. Ghana is now in the process of implementing electronic health systems, which may ultimately help the country's public health services to operate more effectively [11].

There has not been a comprehensive look into the use of electronic health systems in African healthcare settings. As a consequence of this, the major focus of this study was on the difficulties that are involved with adopting an electronic health system in the nations that are located in sub-Saharan Africa.

2. METHODOLOGY

The reviewed studies adopted a cross-sectional study design. A systematic review was carried out with the aid of online research journal websites as well as other in-context articles. While conducting this study, the keywords in the search query were directed toward the barriers to the implementation of an electronic health system in Sub-Saharan Africa. Areas noted in relation to this study were the use of electronic health systems among health professionals. Therefore, there was a linkage of papers pointing out the barriers hindering the implementation of the e-health system.

In addition, the researcher emphasizes that action research is extremely valuable in gaining insights into managerial sense-making, sense-giving, and the impact on decision-making in the midst of change interventions. The researcher collected data using Interviews and questionnaire techniques. The research methodology is appropriate and makes absolute sense because there were evident problems hindering the use of electronic health systems.

3. RESULTS

3.1 Lack of Belief in the Electronic Health System

According to Kemper and other authorities, 58.1% of doctors who do not use electronic health systems do not believe that these records may enhance patient care or clinical outcomes [16]. Another poll found that those who do not want to adopt electronic health data had a dubious attitude toward promises that these

records may enhance medical care [17]. Because of this, many individuals are apprehensive to make use of electronic health systems.

In spite of the general notion that this is an impediment to the introduction of the electronic health system, there is a dearth of concrete facts to support this assertion. In point of fact, the implementation of an electronic health system calls for a shift in the way medical procedures are carried out, which is a move that a lot of people despise and question. Clinicians are more likely to be wary and skeptical of these systems as a result of the societal constraints that are associated with electronic health systems [18].

3.2 Need for Control

It is essential for individual physicians to be allowed to make independent decisions on their practices without interference from the institutions they work for. A person may be considered a professional if they are able to handle all aspects of their job, including the conditions, techniques, processes, and substance of their employment [19]. The widespread usage and acceptance of electronic health systems have caused doctors to express concern that they may lose control over the data pertaining to their patients as well as the operations of their practices. According to Walter and Lopez's research, the degree to which physicians see a danger to their professional autonomy has a significant impact on their perspectives on the use of electronic health systems. According to the results of a poll that looked at 20 different articles, just two of them explored this problem in depth or proposed a solution [19].

3.3 Interference with Doctor-Patient Relationship

Although not much research has investigated the issue, the use of electronic health systems may make it more difficult for patients and physicians to interact with one another. According to the findings of Shachak's study, 92 percent of doctors think that the growing usage of the electronic health system has decreased the amount of face-to-face time that is spent between patients and their doctors [20]. The completion of electronic documentation requires the use of a computer, which may be time-consuming for physicians, particularly if they are

not proficient in its usage. According to the results of the research conducted by Ludwick and Douchette, some medical professionals choose not to utilize electronic health systems since the menus and buttons might be challenging to identify [21].

When using electronic health systems, the amount of time that physicians spent looking at their screens during consultations increased from 25 percent to 55 percent, according to a study that was conducted by Shachak and colleagues, which resulted in less time being spent interacting with patients through direct eye contact and verbal dialogue [22]. The fact that patients have access to their own electronic health system, which might potentially alter the therapeutic interaction, is an issue that is even more worrisome [23].

As a direct result of this, the conventional doctor-patient relationship will shift due to the introduction of the electronic health system. Given that this problem has been largely ignored by researchers up to this point, the question that has to be asked is whether or not patients and doctors should be worried about it.

3.4 Lack of Support from other Colleagues

In most medical offices, you'll find a broad variety of additional healthcare professionals working alongside nurses and office managers, among other similar roles. It is less likely that physicians will continue to use the electronic health system because of their poor technical abilities, concerns about the increased amount of work that will be required, poor impressions, and unwillingness to do so. This is because their colleagues do not provide them with support [24]. Two of the papers that we looked at claimed that a lack of support for the software might lead physicians to be dissuaded from utilizing electronic health systems.

3.5 Unwillingness on the Part of Management to Aid

According to research, health care providers are more likely to adopt electronic health systems if their management believes in the advantages of the electronic health system and supports their usage [25]. However, the vast majority of studies do not take into account the level of dedication shown by management to the electronic health system implementation process.

3.6 Concerns about One's Privacy or One's Safety

Several professionals are of the opinion that electronic health systems might compromise the privacy of patients [26]. An electronic health system is now in jeopardy, which puts the private information of patients in jeopardy. Doctors are concerned that other people could be able to access their electronic health system. If patient information is disclosed in an inappropriate manner, there may be legal repercussions. In certain nations, there are laws in place to protect the privacy and confidentiality of patients, however, in other nations, there is a dearth of rules that specifically address matters of security [25,27].

It has been suggested by Simon and other authorities that medical professionals are more worried about this issue than patients are [28]. The vast majority of medical professionals, even those who work with the electronic health system, are of the opinion that paper records provide a higher level of privacy and protection from unauthorized access [26]. As seen this, the adoption of an electronic health system has been hampered by patients' worries about the safety and confidentiality of the information that identifies them personally, which has led to a lack of innovation.

The use of electronic health systems has the potential to enhance the standard of care that patients get. The adoption of an electronic health system by doctors is contingent upon the existence of a financial incentive for them to do so. It is only via the provision of financial incentives for the use of an electronic health system that doctors will reach the degree of acceptance that is anticipated [29]. According to the research that was discussed in this article, financial incentives are maybe a topic that would be interesting to study further.

3.7 Management Incompetence

At the level of project management, individuals known as leaders or champions play an important part in the completion of successful projects. When it comes to the acceptance of management-level change throughout the course of an electronic health system implementation project, the project leaders and advocates act as the driving force [30]. They must be ready to embrace the risks and expenses associated with the electronic health system in order for them to

get the advantages that come along with its use [29]. We have to make recruiting more participants in the practice a top priority if we want this endeavor to succeed. According to Miller and Sim, practices may not be able to increase their quality or reap financial benefits from electronic health systems if they do not have advocates for the technology [29]. As a direct consequence of this, project leaders and advocates need to be given a higher level of attention in order to boost electronic health system adoption.

3.8 Uncertainty over the Amount of Return on Investment (ROI)

The medical community is concerned that electronic health systems would put a financial strain on their practices and that it will be years before they see a return on their investment in the electronic health system [29]. According to Miller and Sim, the term "financial incentives" might refer to anything from nothing to more than $20,000 per year for a physician, with the typical amount being somewhere around $10,000. [29].There is resistance among medical professionals to using electronic health systems because of the high expenses that are thought to be associated with their usage [31].

3.9 Lack of Financial Resources

There were just a few of research that established a causal link between the use of an electronic health system and a deficiency in financial resources or money [32]. Because of the high initial expenses, it may be challenging for a medical practice to acquire the funds necessary to adopt an electronic health system. It is possible that small and medium-sized practices with limited IT capabilities will not be able to meet these charges due to the high cost of the services.

3.10 Lack of Computer Skills from Health Professionals

According to the results of their surveys, studies have shown that doctors are lacking in fundamental technological understanding and user demands [24]. According to the findings of several studies, medical professionals may not adopt an electronic health system because they are unable to locate a system that satisfies their specific needs or that they can use to fulfill those requirements [16]. There seems to be an urgent need for electronic health system suppliers to

commit more efforts to improve the level of customizability offered by their solutions. Because of this, the expense of establishing an electronic medical system will increase so that medical professionals may provide patients with the kinds of services described above.

3.11 Lack of Proficiency with Computers

An electronic health system cannot function without a significant number of various kinds of technology, such as computers, phone lines, and the internet. According to the findings of various studies, the fact that some practices do not have the "basic" infrastructure and technology essential to enable the use of electronic health systems is one of the factors that is hindering the widespread use of electronic health systems [33]. Additionally, since these practices would need extra resources to successfully adopt an electronic health system, the associated costs will be greater than originally anticipated.

3.12 Expenses Incurred in Picking a New System, Acquiring that System, and Putting it into Operation

According to the findings of recent research, doctors would like to focus their time and efforts on their patients rather than on non-essential components of their professions, such as choosing and obtaining an electronic medical system [32].On the other hand, it is not made crystal clear that doctors are the ones who are in charge of this initiative. When it comes to choosing, procuring, and deploying an electronic health system, the degree of project management is what determines how much time and effort doctors need to put in.

3.13 Time to Learn the System

As a result of the "demands and duties of providing office-based health care," it is possible that they do not have the time required to fully comprehend the system and all of its components [28]. Many individuals say they don't have the time to acquire new skills because they want to avoid having to take time off from their jobs. On the other hand, there are a number of studies that are of the opinion that medical practitioners' output would increase if they had a working knowledge of electronic health systems [32]. More benefit-effort analyses may be necessary before it will be possible to demonstrate the worth of learning and mastering the system.

3.14 Time Required to Enter Data

It has been demonstrated in a surprising number of studies that practitioners who utilize electronic medical systems find it difficult to input data into the systems [17]. According to findings from research conducted by Loomis in 2002, the majority of electronic health system users rated data input as being both time-consuming and burdensome [26]. When confronted with the challenges they face, medical professionals frequently struggle when attempting to enter data.

3.15 More Time and Attention are Spent on Each Individual Patient

It is very uncommon for medical professionals to assert that using an electronic health system takes more time per patient than using paper records. This is due to the fact that paper records are often more practical and effective in clinical encounters [33]. If a doctor is using an electronic medical system and has to pause in the midst of a consultation with a patient to input data or write a prescription, the consultation may be disrupted for the patient. In addition, since physicians are slower at typing and inputting data, they will be able to spend more time with each individual patient.

According to research conducted by Pizziferri and other academics who have focused their attention on this topic, the majority of medical professionals have avoided "sacrificing time with patients or total clinic time, but they do spend more time on paperwork outside of clinic sessions" both before and after the implementation of an electronic health system [20]. According to the same research, electronic health systems do increase the amount of labor that physicians have to perform; but, given the absence of further studies to back up these statements, we should proceed with caution.

The conversion of patient records to an electronic health system is time-consuming and requires a considerable amount of effort. Because "they are only familiar with the summaries they would produce themselves of handwritten notes, histories, and so on," some doctors believe that converting medical records is completely their job. This is because "they are only acquainted with the documents themselves" [34]. It has been shown that electronic health systems impose a considerable burden in terms of both time and money, which may exceed any apparent advantages. It takes a lot of time and effort to transmit patient information, which is why medical offices are hesitant to embrace electronic health systems.

4. DISCUSSION

An investigation of the relevant literature revealed that electronic health systems, which are becoming more prevalent, have a number of drawbacks. In addition to this, it illustrates how the many difficulties are intertwined with one another. Electronic health systems are regarded to be "primary" barriers, which means that the challenges become clearly evident as soon as practitioners use them. This is because electronic health systems are considered to be "primary" hurdles. It became very evident that a number of the difficulties we faced were connected to one another in some way. The difficulties that medical professionals have in rapidly obtaining a hold on the system are contributed to by a variety of variables, including a lack of fundamental computer skills as well as considerable initial and continuing cost commitments.

In order to overcome the high-cost barrier, the purchase price of electronic health system equipment could need low-interest loans or other forms of financing [35]. Anderson believes that in order for the federal government to successfully handle concerns connected to privacy and security, it must first design and then enact a comprehensive national privacy legislation package [35].

By enacting brand new rules and regulations, the governments of a great number of nations have already begun taking the essential measures to resolve these issues. In the United States, the legislation that safeguards people's rights to maintain the confidentiality of their medical information is known as the Health Insurance Portability and Accountability Act, or HIPAA for short (HIPAA). The regulations that regulate the processing of medical data in each nation are equivalent to one another. According to the conclusions of the Study on Legal Framework for Interoperable electronic health system in Europe carried out by the member states of the European Union, there are a number of concerns that need to be tackled in relation to privacy and security. A branch of government that operates under the supervision of the European Union [36].

Table 1. Summary of related studies on this review article

Author/s	Title	Country	Method	Results
Valdes et al. [27].	Barriers to implementing Electronic Health Records (EHRs)	Iran	This study was an unsystematic-review study. The literature was searched on the main barriers to implementing EHRs with the help of library, books, conference proceedings, data bank, and also searches engines available at Google, and Google scholar. For our searches, we employed the following keywords and their combinations: Electronic health record, implement, obstacle, and information technology in the searching areas of title, keywords, abstract, and full text	In this study, more than 43 articles and reports were collected and 32 of them were selected based on their relevancy. Many studies indicate that the most important factor than other limitations to implementing the EHR is resistance to change.
Healy L, Lubeck P., 2012	Barriers and facilitators to Electronic Medical Records usage in the Emergency Centre at Komfo Anokye Teaching Hospital, Kumasi-Ghana.	Ghana	This was a non-interventional, descriptive cross-sectional, and purely qualitative study using a semi-structured interview guide for a study population of 24. The interviews were manually recorded and analyzed thematically. EMR implementation was piloted in the EC. Some of the EC staff doubled as EMR personnel. An open-source EMR was freely downloaded and customized to meet the needs of the EC. The EMR database created was a hybrid one comprising digital bio-data of patients and scanned copies of their paper EC records.	The facilitators for utilizing the system included providing training to staff, the availability of some logistics, and the commitment of staff. The project barriers were funding, full-time information technology expertise, and automatic data and power backups. It was observed that with the provision of adequate human and financial resources, the challenges were overcome and the adoption of the EMR improved.
Oluoch et al. [13]	Electronic medical record systems are associated with appropriate placement of HIV patients on antiretroviral	Kenya	We conducted a retrospective, pre-post EMR study among patients enrolled in HIV care and eligible for ART at 17 rural Kenyan clinics and compared the: (1)	7298 patients were eligible for ART; 54.8% (n=3998) were enrolled in HIV care using a paper-based system while 45.2% (n=3300) were enrolled after the implementation of the

Author/s	Title	Country	Method	Results
	therapy in rural health facilities in Kenya: a retrospective pre-post study.		proportion of patients eligible for ART based on CD4 count or WHO staging who initiate therapy; (2) time from eligibility for ART to ART initiation; (3) time from ART initiation to first CD4 test.	EMR. EMR was independently associated with a 22% increase in the odds of initiating ART among eligible patients (adjusted OR (aOR) 1.22, 95% CI 1.12 to 1.33). The proportion of ART-eligible patients not receiving ART was 20.3% and 15.1% for paper and EMR, respectively ($\chi(2)=33.5$, $p<0.01$). Median time from ART eligibility to ART initiation was 29.1 days (IQR: 14.1-62.1) for paper compared to 27 days (IQR: 12.9-50.1) for EMR.
Cline and Luiz [5]	Information technology systems in public sector health facilities in developing countries: The case of South Africa	South Africa	Ninety-four interviews with doctors, nurses and hospital administrators were conducted in two public sector tertiary healthcare facilities (in two provinces) to record end-user perceptions. Structured questionnaires were used to conduct the interviews with both qualitative and quantitative information.	Noteworthy differences were observed among the three sample groups of doctors, nurses and administrators as well as between our two hospital groups. The impact of automation in terms of cost and strategic value in public sector hospitals is shown to have yielded positive outcomes with regard to patient experience, hospital staff workflow enhancements, and overall morale in the workplace.

It is necessary for medical professionals to demonstrate "meaningful use" of an electronic health system in order for them to be eligible for the federal stimulus cash that was made available by the HITECH Act of 2009. Health Connect provides Australian patients and healthcare professionals with access to a standardized set of electronic health information products and services. Health Connect was developed in Australia. In Australia, the Health Connect organization was founded. The proposal asks for the federal government, as well as the governments of the states and territories, to work together on the development of a standardized, national framework for the electronic health system in order to guarantee that patient information can be transmitted in a safe manner. This is done in order to ensure that patient information can be sent at all.

A number of countries, including but not limited to the United Kingdom, Denmark, and the Netherlands, are now in the process of creating national infrastructures for electronic health care. The United States federal government gives financial help to a number of these efforts in order to make it easier for people to share medical information with one another. According to the findings of the research, there are a number of challenges that need to be overcome before medical professionals are willing to use new technology.

5. CONCLUSION

Patients and doctors alike are reticent to use electronic health systems in their places of work due to a general lack of acceptance of the technology. This is the case even though electronic medical systems provide several benefits. A statistical investigation came to the conclusion that electronic health systems are not utilized by the majority of medical practitioners. This research analyzes the potential reasons that may be contributing to the reluctance of medical practitioners to adopt electronic health systems. When an electronic health system is implemented in medical practice, the workflow will almost always undergo a substantial transformation. Because of the introduction of an electronic health system into the practice, various components of the practice, such as its organizational structure and culture, will need modification in order to accommodate for the new system.

This paper may be useful for electronic medical system policymakers and implementers as an overview of probable barriers that doctors may face throughout the adoption process. When it comes to the electronic health system, the authorities in charge of public health need to be more aware of the fact that even if all of the obstacles that stand in the way of their adoption were removed, this would not guarantee that the records would be successful. This is something that they need to keep in mind. In spite of the fact that this could be the situation, it would be irresponsible of you to jump to the wrong conclusion and assume that a single strategy can be applied to all different kinds of scenarios. There is a wide range of information that has to be prioritized in order to arrive at the conclusion that the most successful interventions for electronic medical system installation and transformation may be determined. They will need to investigate the structures and circumstances of the activities that they are investigating, so the task that awaits them will be both interesting and difficult. This is due to the fact that they will be researching those activities.

COMPETING INTERESTS

Author has declared that no competing interests exist.

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