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Exploring the Impact of Electronic Health Records Systems on the Performance of a Healthcare Organisation-A Qualitative Study in Ghana

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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ABSTRACT

Introduction: The application of the Electronic Health Record System has been extensively acknowledged as an instrument by healthcare establishments to increase efficiency, operational effectiveness and successfully boost revenue generation.
Aim: This study aimed at empirically appraising the impact of electronic health record system on the performance of Pentecost Hospital in Madina in the La Nkwantanang-Madina Municipality in the Greater-Accra Region of Ghana.
Methodology: The study adopted a qualitative approach with a case study design. In-depth interviews and a focus group discussion of a total of thirty-five (35) respondents including ten (10)

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key informants of the Pentecost Hospital were purposely selected to participate in the study due to their role in the implementation of electronic health records system in the facility.
Results and Discussions: The study revealed that frequent loss of data, inadequate knowledge in the management of the system, desire to improve upon work efficiency, longing to have easy access to health records of patients, intermittent waste of client or beneficiary time were among the main factors that led to the introduction of the Electronic Health Record System. The study also identified simplification of activities of the various departments of the hospital, improvement in clients' satisfaction, reduction in waiting time and speed delivery of healthcare, storage of information being faster and lasting, improvement in revenue generation of the hospital and improvement in quality healthcare delivering as some of the effects of the introduction of electronic patient record management on healthcare delivery at the Pentecost Hospital in Accra.
Conclusion: It is imperative to mention that efficient electronic health record system which is geared towards efficient quality healthcare provision would flourish when parity, effectiveness, efficiency and responsiveness of resource utilisation for quality healthcare are considered as the building blocks.

Keywords: Information; electronic health record system; resource utilization; revenue generation; healthcare delivery and improvement.

1. INTRODUCTION

Information processing, its storage and retrieval are very critical to functioning and performance of any organisational decision-making. This is more crucial in the health sector where accuracy and timeliness of patients' records are essential to enhance effectiveness and efficiency in diagnosis, treatment and saving lives. Patients' records are essential documents that compile facts about patients' lives and health. These capture data on past and present illnesses and treatment written by health care professionals caring for the patients [1]. The concept of electronic records "refers to records that are dependable on relevant machines for access or reading, that is, computer hardware and software such as e-mails, database and word processing" [2].

The adoption of electronic health records could present significant advantages for healthcare organizations. It enhances the quality of patients' data and ensures easy accessibility and sharing of patients' information among physicians and in some instances among different providers to facilitate decision making [3]. Also, research has shown that the use of electronic health records improves the safety of patients during medication prescription [4]. Particularly, electronic health records have been shown to reduce medical errors and enhance information sharing between management and clinicians, ensuring improved coordination among healthcare workers [5,6]. Studies have also shown that electronic health records could reduce mortality among the severely sick [7,8] and also enhances patient satisfaction [4].

Even though electronic health records have many recognized advantages for healthcare facilities, its adoption remains a challenge for several organisations in many countries of the world. Several challenges undermine the adoption of electronic health records by healthcare organizations. These include social contagion among neighboring organizations, conflicting policies such as privacy laws, lack of information sharing and operability among vendors, lack of expertise, inadequate computer infrastructure and inadequate funding are some of the challenges that undermine the adoption of electronic health records [9,10,11,12,13]. These challenges have been noted for the low adoption of electronic health records in developing countries [10].

In Ghana, for instance, where electronic health records systems remain a new concept, there is not full adoption in most facilities [11]. However, efforts of successive governments and private actors have seen significant progress in the adoption of electronic health records in healthcare facilities. With the increased adoption of electronic health records in healthcare organisations, it has become necessary for research into the initial effects of this shift towards maximizing healthcare technology on the performance of healthcare organizations. This is necessary to provide the empirical basics for policy makers and health managers to promote full adoption of electronic health records systems for improve quality of care.

Yet, studies on the rational for the adoption of electronic health records and the impacts on the

performance of healthcare organisations in Ghana are limited. Research has largely focused on quantitative estimations of the benefits of electronic health records on for instance patients' satisfaction [11,13,14] with little emphasis on the in-depth experiences of healthcare workers. This perspective to the literature will provide a rich understanding of the reasons that informed the adoption of electronic health records systems in healthcare organisations and the impacts post adoption. This study, therefore, sought to assess the rationale for the adoption of electronic health records and its impact on the performance of the Holy Pentecost Hospital in Accra, Ghana.

2. MATERIALS AND METHODOLOGY

The study employed a qualitative method with a case study design. According to Bhandari (2020), qualitative research entails gathering and analysing non-numerical data, for example, text, video or audio.

The study used both primary and secondary sources of data. In this research, primary data were collected through a well-structured flexible interview guide and focus group discussions of five respondents in each group of seven

In this qualitative study, the researcher employed tools such as stenography, grammarly, quetext, field note book and audio recorder. The stenographer assisted the researchers to record the responses of respondents in the short hands to enable the interview process move faster than expected without necessarily writing long sentences. The grammarly helped in identifying spelling mistakes and equally correcting grammatical errors during the report writing. The quetext helped to determine plagiarised contents and worked towards their rectification.

In using the in-depth flexible interview guide, questions were based on the two specific objectives. Permission was sought from respondents to record the interview between the researchers and the respondents and where respondents declined to be recorded, field notes were taken. To enrich the data collected from the respondents, a focus group discussion was added to the individual interviews for the purpose of triangulation.

The study population was the entire Pentecost Hospital in the La Nkwantanang-Madina Municipality in the Greater Accra Region of Ghana with a sample size of thirty-five (35). The study employed purposive sampling techniques. Healthcare staff who were deemed to be better positioned to have more knowledge on the topic such as, management members, department heads and staff with at least five years working experience were selected for the study. The data was manually analysed using thematic analysis methodology by coding and developing themes using Microsoft Excel.

3. RESULTS

3.1 Factors Leading to the Introduction of Electronic Patient Record Management System at the Pentecost Hospital in Accra

When asked about what motivated the hospital to adopt an electronic health records system, various reasons came up. These reflected the widely known challenges associated with the use of paper-based systems of health records. The factors that inspired the adoption of an electronic health records system in the hospital have been presented below.

3.2 Frequent Loss of Data

The preliminary study revealed that there were a number of factors that led to the introduction of the electronic health records in the Pentecost Hospital in Madina in the La Nkwantanang Municipality. The interviews conducted revealed that several factors informed management of the Pentecost Hospital to shift from the paper – record keeping system to a paperless electronic health management record system.

A respondent of the hospital mentioned that one of the key factors that informed management's decision to adopt the electronic health management record system was the frequent loss of clients' data. He explained that in many a time, the hospital usually lost the medical records of its cherished clients due to the regular movements of files and other records from one department to another and this habit often occasioned the loss of such documents. The administrator lamented that:

> *"The hospital has decided to go electronically because of the constant "loss of medical records of our cherished clients and some of them are beginning to lose confidence in our data management system. For this reason, the management thought it economically*

wise to move from the paperwork to computerised system of keeping the data of our clients".

3.3 Inadequate Knowledge in the Management of the System

An employee in the records department of the hospital added that the management of the hospital had issues with their data management system. She explained that the management of the health records of the hospital had become very difficult to handle even with the help of trained records keepers in the records department. She buttressed her fact by saying that formerly, the records keepers of the hospital had to spend long minutes or sometimes hours in search of clients' health records, often delaying the health care delivery chain. She bitterly mentioned that clients had to be waiting for several minutes or hours causing a hold up at the hospital. She was quick to add that in the event of any disasters, clients' data will be lost. She lamented that:

"It was because of long waiting time of patients and the loss of patients' information which triggered the adoption of the electronic health record management system".

She added that:

"The electronic health record management system has been identified as the best form of data storage by experts".

However, she was quick to mention that the hospital needed to train the personnel of the ICT and the Records Departments to be able to management the electronic health record management system very well.

3.4 Improving upon Work Efficiency

Furthermore, two of the nurses in the hospital concurred on the fact that the hospital introduced the electronic health record management system as a way of improving upon its work efficiency. They explained that after the introduction of the NHIS, there was an increase in the number of patients who visited the out-patient department (OPD) of the hospital. The hospital knowing how the paper-record keeping system would slow its operation opted for a more efficient and accurate system of data management. This was done in order to achieve the aim of providing affordable and quality health care to all persons, especially the poor and vulnerable in the community. A respondent said:

"The introduction of the electronic health record management system by the Pentecost Hospital was necessitated by the increase in the number of clients who visited the facility with the introduction of the NHIS".

3.4.1 Effects of electronic patient record management on healthcare delivery

Another focus of this work was to assess the effects of the adoption of electronic health records on performance of the hospital. Various benefits of the electronic records system emerged from the analysis as shown below.

3.5 Simplification of Activities of the Various Departments

The preliminary study revealed that the introduction of the electronic health record management system had had positive effects on the operations of the hospital both in terms of productivity and profitability. The maiden study identified that the hospital has benefited tremendously from the introduction of the EHRS since both patients and management had lauded the benefits accrued to the EHRS since its inception.

A key informant of the hospital explained that the introduction of the EHRS had simplified activities of the various departments, especially, the records department. He added that the EHRS had incredibly increased revenue and reduced patient waiting time. He intimated that:

"The hospital has made sufficient gains in the areas of operations and revenue generation".

The key informant was swift to mention that in spite of the tremendous benefits the hospital had gained, the installation of the system was very expensive. He added that it could take only management that was strongly committed to providing quality healthcare services to invest so much in the provision of efficient and effective EHRS.

3.6 Improvement in Clients' Satisfaction

Another key informant of the facility explained that one of the reasons for introducing the EHR

system was to improve upon clients' satisfaction. He added that the long queues usually seen at the hospital was inexcusable. He bolstered his point by saying that it previously took clients long hours to retrieve clients' records. Conversely, the introduction of the EHR system has improved upon clients' satisfaction. Health information could now be easily retrieved at the request of the client or a medical staff. During the treatment of certain conditions for instance, the non-communicable diseases (NCDs) and weight management, the previous medical records were key in determining whether there had been an improvement or not. He intimated that:

> *"The EHR is able to curtail long waiting time of patients (usually patients could wait the whole day) but this time the situation has changed due to the EHR".*

However, the respondent was quick to mention that even though it had reduced the waiting time, patients who were not computer-inclined usually found it difficult to come to terms with the system.

3.6.1 Reduction in waiting time and speed delivery of healthcare

A patient in the OPD and another in the maternity ward explained that the introduction of the EHR has equally made the work of the personnel of the hospital faster and waiting time has been reduced for us.

A nurse at the OPD explained that the paper-record system was difficult to manage. She opined that unlike the paper-record system, the EHR made the updating of patients' records less tedious. She compared the two methods of keeping patients records and concluded that with the paper-record system, when patients' folders were not found, the facility needed to issue new folders to patients, making it very difficult for the physician to track changes.

At the pharmacy, a representative said the EHRS was said it was a system that simplified the operations of the physicians at the hospital. The respondent said for example that:

> *"It has made retrieval of documents easy by just a click of a button;*
>
> *It has made the retrieval of documents easy by just a click of a button".*

The pharmacist explained that records keepers did not have to search through dusty folders to search for patient's folder. He re-echoed that:

> *"A click of a button gives you all you need to generate years of information for you to access".*

3.6.2 Storage of information was faster and lasting

The study further revealed that the EHR was fast and stored information longer than the paper-record system since some of the documents could be damaged due to rain and other forms of disasters. A respondent was captured saying:

> *"It is easier, fast and stores information for a long time compared to manual and updates patients' records and easy to retrieve information"*.

3.6.3 Improvement in revenue generation

The preliminary study further revealed that efficient and effective use of the EHR improved upon revenue generation of the facility. The study observed that the use of the EHR system had reduced the expenditure on procuring stationery even though no financial data were made available. It was also easy to retrieve fled bills. The system kept the information of patients who had outstanding bills to pay to the health facility. They did not only track individuals who had absconded but were able to locate their area of residence since their bio data were captured. It instructed the payment of the previous bills before they were given any other form of healthcare.

3.6.4 Improvement in quality healthcare delivery

The study identified that the hospital recently installed the EHR to provide quality healthcare services to the people in the catchment areas and even beyond. A respondent at the Finance department remarked that:

> *"The EHR of the Pentecost Hospital has provided efficient and accurate information to the facility and has increased revenue as compared to the manual system"*.

A patient in the maternity ward stated that:

"The EHR makes work easier, helps keep patient records very intact including their locations to prevent absconding; some of the patients will run away after receiving treatment so this system will help the facility to track the bad ones among us".

4. DISCUSSION

The study sought out to understand the rational for the introduction of the electronic health records system at the Pentecost Hospital and the effects it has had on the performance of the facility. The study found that major challenges associated with the traditional paper-based system and a desire to better healthcare outcomes led to the adoption of the electronic health records system in the facility. This reflects the concept of perceived usefulness (Moris et al., 2003) which pertains to an employees' perceptions of the expectant benefits of information technology systems on job performance. Also, the challenges mentioned confirm the widely known challenges associated with paper-based systems and reflect the need for improving healthcare information systems in developing countries [15,10,12].

Additionally, the study assessed the effects of the adoption of electronic health records on the performance of the facility. The results of the study showed that the use of the system has several benefits which are not so different from what have been reported in the literature. For instance, a study has reported that physicians spend less time generating electronic medical charts as opposed to manual charts [16]. Also, accessibility to patients' records is enhanced with electronic health records systems [17] and enhance job satisfaction among healthcare workers [18,19,20].

5. CONCLUSION

This study was carried out at the Pentecost Hospital in Madina, a suburb of Accra with the aim of assessing their Electronic Health Record System. The study revealed that frequent loss of data, inadequate knowledge in the management of the system, desire to improve upon work efficiency, longing to have easy access to health records of patients, intermittent waste of client or beneficiary time were among the main factors that led to the introduction of the Electronic Health Record System. The study also identified simplification of activities of the various departments of the hospital, improvement in clients' satisfaction, reduction in waiting time and speed delivery of healthcare, storage of information being faster and lasting, improvement in revenue generation of the hospital and improvement in quality healthcare delivering as some of the effects of electronic patient's record management on healthcare delivery after its introduction, giving hope to the health facility. The results of the study have both practical and theoretical implications. On a practical level, the study presents the empirical contribution necessary to inspire the adoption of electronic health records in healthcare organizations in Ghana and other developing countries. Also, on a theoretical level, the study provides the rich experiences of healthcare staff on the current topic and this enriches the state of evidence in the literature which has largely focused on a quantitative assessment of the topic.

CONSENT

Ethical principles of privacy and confidentiality were particularly upheld not collecting and reporting information that reveals the identities of respondents. Also, respondents voluntarily participated in the study and in all cases their consent was sought through a written informed consent.

ETHICAL APPROVAL

It is not applicable.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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