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Assessing Value Added in the Use of Electronic Medical Records in Nigeria

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Walden University

College of Management and Technology

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Isaiah G. Abimbola

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Walden University
2015

Abstract

Assessing Value Added in the Use of Electronic Medical Records in Nigeria

by

Isaiah Gbenga Abimbola

MS, Regis University, 2004

BA, Thomas Edison State College, 1996

Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Philosophy

Information Systems Management

Walden University

May 2015

Abstract

Electronic medical records (EMRs) or electronic health records have been in use for years in hospitals around the world as a time-saving system for patient record keeping. Despite its widespread use, some physicians disagree with the assertion that EMRs save time. The purpose of this study was to explore whether any time saved with the use of the EMR system was actually devoted by doctors to patient-care and thereby to improved patient-care efficiency. The conceptual support for this study was predicated employing the task-technology fit theory. Task-technology theorists argue that information technology is likely to have a positive impact in individual performance and production timeliness if its capabilities match the task that the user must perform. The research questions addressed the use of an EMR system as a time-saving device, its impact on the quality of patient-care, and how it has influenced patients' access to healthcare in Nigeria. In this research, a comparative qualitative case study was conducted involving 2 hospitals in Nigeria, one using EMRs and another using paper-based manual entry. A purposeful sample of 12 patients and 12 physicians from each hospital was interviewed. Data were compiled and organized using Nvivo 10 software for content analysis. Categories and recurring themes were identified from the data. The findings revealed that reduced patients' registration processing time gave EMR-using doctors more time with their patients, resulting in better patient care. These experiences were in stark contrast to the experiences of doctors who used paper-based manual entry. This study supports positive social change by informing decision makers that time saved by implementing EMR keeping may encourage doctors to spend more time with their patients, thus improving the general quality of healthcare in Nigeria.

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Dedication

This dissertation is dedicated to God Almighty, who has seen me through all these years in spite of the difficulties that I had encountered along the way. I also dedicate this study to my wife, Yetunde, and to my children, Adebola, Gideon (Bankole), Abigail, and Naomi. While Adebola is already in another state, my three other children are with us. Gideon, who plays football and does track and field, always wanted me to be at every game. Gideon understood my busy schedule, and I thank him for this. There are many times that I felt like giving up on my studies, but my wife was always there to encourage me and would even go into fasting and prayers. She rejoiced at every success along the way and also felt the pain whenever I was depressed. My two little girls (Abigail and Naomi), who are often fond of coming around me, sometimes got upset whenever I told them I was busy. They could not understand until lately, when they have turned 8 and 5, respectively. They promised to remain quiet and that they would turn down their video games volume, just to stay with me. I have promised them that after my degree, I would spend more time with them. Regardless of several times that I have awakened at night or early in the morning, my wife would also wake up to wish me well and also to encourage me. Her dedication and support has pulled me though. To this wonderful woman in my life, I say thank you.

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I would like to thank God for this mercy and protection over me all these years in spite of all the obstacles along the way. Next, I would like to acknowledge the support of my mentor Dr. Robert Levasseur (Dr. L), who is my third Chair during the course of my dissertation. After my other Chairs left the university, I was discouraged that I would not be lucky enough to find another good chair again. I was wrong. I told one of my colleagues that I picked Dr. L as my mentor, and that other than his impressive credentials, I did not know much about him. My friend told me that if he could have his way, he would prefer Dr. L to be his mentor. That was all that I needed to be sure that I have a good Chair. Dr. L is a wonderful and a dedicated teacher. He stays on top of things and provided me with the guidance and support to graduate. I would also like to thank my previous Chairs, Dr. Aqueil Ahmad and Dr. John Latham, for their dedications. Dr. Latham spent only one quarter with me, but he definitely earned my acknowledgement. I would like to thank my committee member, Dr. Marion Smith, who had taught me a couple of classes before becoming my committee member. I would also like to thank my University Research Reviewer, Dr. Jeffrey Prinster. There are not enough words to thank the staff of Ekiti State University Teaching Hospital and General Hospital Isolo Lagos, for assisting me to distribute my research invitations and for their support during the course of the interview. Finally, I am thankful to my family, friends, and research participants from the afore-mentioned hospitals. Without them, I would not be able to complete this Ph.D. May God bless you all.

Table of Contents

List of Tables

Chapter 1: Introduction to the Study

Introduction

Electronic medical records (EMRs) and electronic health records (EHRs) are seen as synonyms in health care industry (Boosntra & Broekhuis, 2010). With attention to improving the quality of health care in the United States, the Bush administration proposed a plan that would enable all U.S. citizens to have easy access to their medical records by 2014 (Hoffman, 2009; Morton & Wiedenbeck, 2009). To uphold the commitment of the federal government to this initiative, President Obama provided about $20 billion dollars to the American Recovery Reinvestment Act of 2009 to encourage all health care organizations in the United States to implement EMR systems within 5 years (Hoffman, 2009). According to Hoffman (2009), from this money, a physician is eligible for up to $64,000.00, and a hospital could receive up to $11 million if an EMR is implemented.

The use of EMRs in the United States lags behind Europe, Australia, and Canada (Hoffman, 2009). According to Hoffman (2009), 4% of American physicians are using a full functioning EMR, while only 13% use the system at its basic level. Smith (2011) stated that 60% of physicians in private practice in British Columbia are currently using EMR and that the number is increasing yearly. Smith stated that the upward trend in the use of EMR presented an opportunity to address the growing challenge of health care. In spite of the upward trend in the use of EMRs as reported by Smith, the rate of adoption is relatively low (Boonstra & Broekhuis, 2010). Boonstra and Broekhuis (2010) stated that some of the reasons for the low rate are due to financial or training reasons, including

high start-up costs, uncertainty over rate of the return on investment (ROI), clinicians' lack of computer skills, and disruption in workflows.

Smith (2011) argued that EMR ease of presenting data, tracking, and managing chronic illnesses could lead to an active collaborative environment between patients and their doctors. For example, DiZazzo, a patient in British Columbia with numerous chronic health issues, was surprised when she was sent a reminder of her blood test to monitor her kidney function, glucose level or blood pressure level (Smith, 2011). According to Smith, the patient was able to follow topics on her previous appointments and was able to monitor each condition of her illnesses. DiZazzo also appreciated the fact that her doctor could easily track the list of her current medications and refill schedules (Smith, 2011). Thus, the use of EMRs has created "a timely, complete, and easily accessible record for both patient and physician to see and use" (Smith, 2011, p. 461). According to Smith, DiZazzo believed that once patients become aware of the use of EMR and its benefits, they will soon be requiring private practices to incorporate the use of this technology in treating patients.

Calder (as cited in Smith, 2011), a member of a group practice at Osoyoos Medical Center in Canada, stated that he has become an enthusiastic user of EMR within 2 years of its implementation. According to Calder, the use of the report generated by EMR made it easy for him to contact women between the ages of 50 to 80 to remind them of their mammogram appointments. With the use of EMR, Calder was reported to be able to identify a group at risk, demonstrated the size of breast tumor via visual aid, and was able to increase the rate of testing his patients from 60% to 70% (Smith, 2011).

Calder (as cited in Smith, 2011) stated that the use of EMR has saved him from going through endless paper charts which has allowed him to spend more time with his patients. According to Smith, Calder felt that by spending more time with his patients, he has been able to provide better care for them. However, the percentage or the amount of time saved that was transferred to patient care was not mentioned. Accordingly, the basis of this research is to explore whether doctors have devoted more time to patient care with the use of EMRs as opposed to a paper-based medical record.

Interest in information retrieval (IR) system was motivated by the desire to improve access to information (Hersh, 2003). This motivation can be extended to the creation of clinical information systems (CIS) to assist physicians to reduce time and to aid them in their daily decision-making (Van de Velde, 2003). EMR as a component of a CIS is stated to have reduced the time spent on retrieving and collecting patients' information, which has led to an increase in the time spent by clinicians with their patients (Calder as cited in Smith, 2011). Brewin (2006) stated that some medical practitioners claim that EMR does not save time, and that this may have been responsible for the low rate of adoption. On the other hand, physicians like Calder (as cited in Smith, 2011) argued that using EMR has allowed him to spend more time with his patients. Accordingly, this argument will be explored in this research on whether the time saved in using EMRs during the course of patients' treatment in Nigeria has allowed clinicians to spend more time with their patients. This chapter includes (a) a discussion of the health care system in Nigeria, (b) an overview of the organizational hierarchy of a typical health care center in Nigeria, (c) the background of the problem, (d) a statement of the problem,

(e) the purpose of the study, (f) the research questions, (g) a conceptual framework, (h) the nature of the study, (i) the assumptions, scope, and limitations of the study, (j) the significance and social change implications of the study, (k) important terms, and (l) a summary.

Health Care System in Nigeria

Nigeria obtained independence from Britain in 1960 (Odom, 2008). The country also inherited its health care system from Britain (Scott-Emuakpor, 2010). Scott-Emuakpor (2010) stated that while much has changed in the British health care system from 1960, Nigeria has pretty much maintained the inherited system and has not evolved much beyond it. He also noted that prior to Western traders in Nigeria, there were several traditional ways of delivering health care in the country. Patients sought treatment via divine healers, herbalist, bone-setters, soothsayers, and mid-wives. In spite of over 150 years since the introduction of Western style medicine in Nigeria, traditional healers still coexist. The reason for the continuing existence of traditional healers is not far-fetched since the origin of disease in Africa is often attributed to an ailment caused by an enemy who cast a spell or as a result of punishment for previous sins committed by the sufferer. The prevalence of traditional healers in Edo State (Nigeria) is such that for every Western style medical practice sign post, there are three other traditional healers' sign posts in the same area.

According to Scott-Emuakpor (2010), the emergence of organized health care services began in 1886 by the Church Missionary Society. He recorded that the first hospital in Nigeria was established in 1885 at Sacred Heart Hospital in Abeokuta (Ogun

State) by the Roman Catholic Mission. In the early 1900s, Britain created centralized health care services across West Africa that encompasses Nigeria, Gambia, Ghana, and Sierra-Leone. However, between 1952 and 1954, the control of medical services was regionalized in Nigeria: West, North, and South. The author noted the following major development plans in health care services in Nigeria over a period of many years:

1. 1945 – 1955: The first colonial development plan.1956 – 1962: The second colonial development plan.
3. 1962 – 1968: The first national development plan.
4. 1970 – 1975: The second national development plan.
5. 1975 – 1980: The third national development plan.
6. 1981 – 1985: The fourth national development plan.
7. 2004 – 2008: Five year strategic plan.

There are seven developmental stages of the health care system in Nigeria. However, the fourth national development plan was considered historically very significant. Preventive care policy was emphasized during the developmental period of 1981 to 1985. That plan is still in existence today. To facilitate this development, three levels of health care facilities were established as indicated below:

1. Comprehensive Health Centers (CHC)–serves communities of more than 20,000 people.
2. Primary Health Centers (PHC)–responsible for communities of 5,000 to 20,000 people.

3. Health Clinics (HC)–serves 2,000 to 5,000 people.

The above institutions were built and operated by the states and local governments, while the federal government provides the financial aid for the operation. This approach places the responsibility of managing health care services to be operated jointly by the federal, state, and local government (Scott-Emuakpor, 2010).

Nigeria currently consists of 36 states. There are over 500 local government areas (LGA) in the country. Each LGA has about 150,000 to 250,000 people. In the fourth national development plan, a LGA would have a minimum of 7 PHCs, 30 HCs, and at least one CHC. In the larger LGA, each of them has at least 12 PHCs and 50 HCs that serve one or more CHCs. Despite these efforts, services have continued to deteriorate. The deterioration has, however, led to various industrial-type actions or protests by all classes of medical practitioners since the 1980s (Scott-Emuakpor, 2010).

Organizational Hierarchy of a Typical Health Care Center in Nigeria

In a major medical center in Nigeria, the chief medical officer is the head of the hospital. A typical health care center in Nigeria has a bureaucratic structure in spite of various attempts to decentralize it for effective management (MPA775, 2010). According to MPA775 (2010), the top level in organizational chart is the chief medical director (CMD), who is usually a medical doctor. It is the responsibility of CMD to see that assigned tasks for suitable personnel are carried out. The position of a CMD is also considered an executive position; moreover, he or she is accountable to the hospital board of management. The director of administration and the chairman of medical advisory committee report to the CMD. Jos University Teaching Hospital (n.d.) described the role

of director of administration and chairman of medical advisory committee as (a) to coordinate all departmental activities, (b) to ensure accurate records of activities of personnel of the hospital, (c) to monitor staff performance, (d) to oversee the welfare of patients and staff of the hospital, (d) to ensure cordial relationships among staff, patients, and other stake holders of the health care sectors, and (e) to ensure implementation and compliance with policy in order to improve health care services.

Background of the Study

Health care professionals in Nigeria have reportedly complained of the declining quality of health care in Nigeria. Adeyi (2011) attributed the deterioration in healthcare delivery to lack of fund, mismanagement, and the impact of civil war. Adeyi argued that educational resources to improve the existing infrastructure must be provided by the government. Other authors like Awokola et al. (2012) cited the use of health IT like EMR as a tool to improve the quality of health care. Awokola et al. stated that although there is a global acceptance of EMR for medical practice, they admitted that implementing EMR in Nigeria is a challenge. Awokola et al. attributed some of the difficulties of EMR implementation in the country to poor electricity supply, organizational barriers, high cost of purchasing software, and lack of technical skills.

EMR systems are seen as a way to improve quality of healthcare and to minimize treatment time (Biruk, Yilma, Andualem, & Tilahun, 2014). In a survey of parents of patients at pediatric rheumatology practice in Pittsburgh, Pennsylvania, in a month before implementation of an EMR system, and 3 months after the implementation, Rosen, Spalding, Hannon, Boudreau, and Kwoh (2011) reported that parents of patients agreed that EMR has improved the quality of health care of their children. Rosen et al. also stated that the parents of those children were reportedly happy that doctors were able to spend more time with their children.

Patients' access to their healthcare records has been described as an empowerment for patients; however, progress has been limited due to resistance by healthcare professionals because of their concerns about security, privacy and legal

constraints (Mold et al., 2012). In Denmark, patients are asked to look for their own information, which has been converted from a local EHR to their own E-Record for easy access (Norgaard, 2013). Healthcare professionals have stated that EMR can improve the quality of healthcare (Biruk et al., 2014). They have also stated EMR has saved physician time and has allowed them to spend more time with their patients (Rosen, et al., 2011). However, there has been no indication whether the time saved had been devoted to patient-care. In this study, I have explored how EMR has impacted the quality of healthcare in Nigeria. I have also investigated whether the time saved by EMR has been devoted to patient-care in an attempt to improve quality of healthcare in that country. Moreover, I have explored the impact of EMR on patients' access to their healthcare records in Nigeria.

Statement of the Problem

The EMR system has been used for many years in many hospitals around the world as a time-saving tool over the traditional manual patient record keeping. The research problem addressed in this study is that information is generally lacking on (a) amount of time actually saved by EMR and (b) whether the time saved is actually devoted by doctors to patient-care and thereby improves patient-care efficiency. The EMR system is seen as a way to improve quality of healthcare and to minimize treatment time. (Biruk et al., 2014). In a survey of parents of patients at pediatric rheumatology practice in Pittsburgh, Pennsylvania, Rosen et al. (2011) reported that parents of patients agreed that EMR has improved the quality of health care of their children. The parents of those children were reported to be happy because physicians at the hospital have spent

more time with their children. Awokola et al. (2012) argued that the use of health IT like EMR could improve the quality of care in the country and that the technology would improve patient-care efficiency. However, infrastructure in Nigeria is not adequate for successful implementation of EMR (Pantuvo, Naguib, & Wickramasinghe, 2011). In spite of the stated inadequacy of infrastructural development, some multinational companies, which have their own medical centers like ChevronTexaco Nigeria Limited in Lagos, Nigeria, have been able to implement Health IT by using EMR (Aremo, Aeolian, Irrechukwu, & Olugbenle, 2004).

Purpose of the Study

One of the benefits of EMR is that clinicians would have more time for patient care (Lieber, 2011). However, others like Overgage (as cited in Brewin, 2006) argued that EMR does not save time. Therefore, the purpose of this research was to investigate how EMR has influenced patient-processing time and quality of care through a comparative case study involving two hospitals in Nigeria in which one of them was using EMR and the second hospital employed traditional manual patient record keeping. Vendors Electronics (an EMR company) argued that the impact of productivity on using EMR varies among physician group (InformationWeek, 2010). According to Goodhue and Thompson (1995), research on the linkage of technology and individual performance is ongoing. Information technology performance impact must have a good fit for the task that it supports (Goodhue & Thompson, 2005, as cited in Cane & McCarthy, 2009). In this study, I examined whether physicians in Nigeria have found that because of EMR they have more to time to spend with patients than physicians in facilities that use

traditional paper-based manual records; and if so, whether the time saved has actually resulted in more effective patient care.

Research Questions

1. How does the use of EMR influence patient-processing time in Nigeria?
2. How does the use of EMR in the treatment of patients impact the quality of healthcare in Nigeria?
3. How does the use of EMR influence patients' access to their healthcare information in Nigeria?

Conceptual Framework for the Study

The conceptual framework for this research is informed by task-technology fit theory (TTF). Task-technology theorists argue that information system use and performance benefits must be aligned with the task for which it is intended (Dwivedi, Wade, & Schneberger, 2012). Galbrath (1993, as cited in Dwivedi et al., 2012) stated that the premise upon which TTF is built is that the outcome is predicated upon the degree of alignment. Goodhue and Thompson (1995) created the task-technology fit model that focuses on the alignment of certain systems with specific tasks. The fit is to match the capabilities of technology with the requirements of the task by measuring the degree to which the technology would assist an individual in performing a task (Robles-Flores & Antonio, 2012).

CIS was designed to ease the retrieval and management of all hospitals' administrative information in order to improve the quality of health care (Van de Velde, 2003). For this system to have any added value, Van de Velde (2003) argued that it must

have a user friendly interface that should provide a faster response time that is adaptable to clinicians' daily practice. Van de Velde stated that a long-term objective of health care is the provision of EMRs in the form of texts, waves, and images that could be kept for a long time. According to Van de Valde, these provisions are not obtainable in a manual entry system.

Esmaeilzadeh, Sambasivan, and Kumar (2010) stated that previous researchers only focused on hospital investment in IT rather than the change that it has effected in health care delivery. Innovations created by the use of IT can lead to improvement in their organizational performances and thereby increase their competitive advantages (Barone & Shmerling, 2013; Esmaeilzadeh et al., 2010). Smith and Carayon (1995, as cited in Karsh et al., 2013) argued that the success of any technology is dependent upon the integration of the system with the whole work system.

Nature of the Study

The nature of this study was qualitative research, focusing on comparative case studies of two major health care centers in Nigeria. Case study research entails focusing on one instance of issues under investigation, rather than a spectrum of issues (Denscombe, 2003). The research was limited to investigating any time saved in the use of EMR in comparison with paper-based medical records (PBMR) system at two health care centers in Nigeria, in the hope that the outcome would help explain similar scenarios in other established health care centers in the country. I explored whether the use of EMR has saved time or not. In order to collect my research data, I visited each hospital and acted as an observer. I also interviewed 20 randomly selected patients from each hospital

and asked questions on their number of visits to the same hospital for the same treatment, the waiting time from admission to discharge, the time spent with their physicians, and how long it took to get their medical records (in EMR or PBMR). I collected data from at least five doctors from each hospital under study, focusing my questions on the number of patients that they see per day and on how much time they spent with patients on each visit. I also asked questions on whether the use of EMR has actually saved physicians time by allowing them to spend more time with their patients. My investigations also encompassed any relevant documentation, newspapers, and any other reports that were available at the time. Further details on the method of data collection are provided in Chapter 3.

Assumptions

It was assumed that the two major health care centers from which this research was conducted are major providers of tertiary health care in Nigeria. Moreover, it was assumed that the centers are representative of other major health care centers in each state in Nigeria. I also assumed that access would be granted to examine the policies and procedure of these hospitals in addition to having access to staff and patients. Since medical school education in Nigeria is conducted in the English language, it was assumed that all oral and written communications with clinicians and support technicians would be conducted in the English language.

Scope and Limitations

While the overall quality of health care in Nigeria is a major concern, this research addressed on the impact of EMR on the quality of health care with respect to

time saved in the course of treating patients in the country. Accordingly, this research was limited to data collected and analyzed during the study timeframe. Although I do speak the native language (Yoruba) of the area in which the research was conducted, direct translation of the English language to the native language for those who do not speak English could be a challenge with some questions. Therefore, I only interviewed those who can speak English. Since these hospitals likely had patients from other ethnic groups in the country who do not speak the native language or understand English, the group was not included in the sample.

Significance and Social Change Implications

The goal of this research was not to resolve the entire health care problems in Nigeria. The academic significance of this study will be to address (a) whether EMR actually saves time in clinical practice and (b) if the time so saved actually results in more time for patient care. The study results may encourage other hospitals in Nigeria to implement EMR practices and thereby help improve health and healthcare—undoubtedly, a contribution to positive social change. This contribution is consistent with Walden's definition of positive social change as applying strategies, ideas, and actions that could enhance the development of society (Walden, n.d.).

Key Terms

Capital expenditure: Money spent on facilities and equipment (Nurudeen & Usman, 2010).

Naira: The name of the official currency of Nigeria. The rate of exchange with dollars varies, and at the time this writing, the exchange rate was 157.50 Naira to 1 U.S. dollar (NGN – Nigerian Naira, n.d.).

ObamaCare: A pejorative term for United State Affordable Care Act of 2009 that was passed into law under the Obama Administration in 2012 (Angell, 2013).

Recurrent expenditure: Money spent on salaries and wages of workers (Nurudeen & Usman, 2010).

Western world: Refers to United States, Canada, and some countries in Europe like Great Britain, Germany, and Italy.

Summary

Information technology such as EMR has been promoted by vendors as having a competitive advantage over medical records manual operations. Many hospitals around the world have started to deploy this technology in an attempt to improve the quality of their health care delivery system. Some doctors have stated that EMR has helped them to spend more time with their patients and has thus allowed them to improve the quality of their health care delivery. A comparative qualitative study on the use of an EMR and manual record entries was explored at two different hospitals in Nigeria. The result of this study could help address the advantage of EMR as a time saving device over PBMR. This study could also serve as a guide to encouraging the deployment of EMR across Nigeria.

Relevant research that discusses the advantage and the use of EMR will be expanded in Chapter 2. The research method that was used is discussed in Chapter 3. The

examination of data and its analysis is provided in Chapter 4, while the reports, findings, and conclusion with future recommendations for the research are explained in Chapter 5.

Chapter 2: Literature Review

Chapter 2 is a review of the literature of the background theory and research related to the present study and its methodology. The research methodology is a comparative study of two hospitals in Nigeria. One of these hospitals uses an EMR system and the second one focuses on a traditional paper-based manual entry. EMR systems have been used for many years in many hospitals around the world as a time-saving tool over the traditional manual patient record keeping. However, some physicians disagree with this assertion. The purpose of this study was to explore whether any time saved with the use of the EMR system was actually devoted by doctors to patient-care and thereby improved patient-care efficiency.

The EMR system is perceived to impact quality of healthcare in a positive way (Biruk et al., 2014). These authors also stated that EMR has minimized treatment time. Rosen et al. (2011) reported that EMR has improved the quality of healthcare in a survey of parents of patients of pediatric rheumatology practice in Pittsburg, Pennyslvania. Additionally, in Denmark, patients are now being asked to look for their information on E-Record for easy access (Norgaard, 2013). Therefore, the purpose of this research was to investigate how EMR has influenced patient-processing time and quality of care through a comparative case study involving two hospitals in Nigeria, one using EMR and the second hospital employed paper-based medical record system. I also investigated how the use of EMR has impacted the quality of healthcare in Nigeria.

A comparative case study was chosen for this research in order to allow me to explore the time that clinicians spent with their patients in two different scenarios. The

goal was to explore whether the hospital that uses EMR has been able to save time, and if so, whether the saved time has been used to improve the quality of health care in that hospital. Some literature on EMR or EHR that focused on advantages, trends, and challenges in several countries, such as Nigeria, United States, Canada, and Europe were considered. The use of EMR in the United States, Canada, and Europe served as a frame of reference to explain the trends and challenges in Nigeria. However, whatever is unique to Nigeria challenges with respect to EMR was described accordingly. In this chapter, I discuss the literature search strategy, theoretical foundation, financial benefit of EMR, technical, time, safety, legal, social, and organizational context, alternate methodologies, and summary.

Literature Search Strategy

Peer-reviewed articles that were less than 5 years old were selected from online databases like ProQuest, Academic Search Premier, Business Source Complete, and Emerald Journal. The aforementioned databases were searched using various combinations of key words such as *EMR, EHR, health care, quality,* or *Nigeria health care*. The references selected for this research were based on their relevance to the study, its purpose, and research questions.

Theoretical Foundation

The conceptual framework for this research is informed by TTF. The proponent of this theory posited that the success of any information systems is contingent upon an adequate match between the system and the tasks to be performed (Gebauer & Ginsburg, 2009). Galbrath (1993) argued that the premise upon which TTF is built is that outcome

is predicated upon the degree of alignment (as cited in Dwivedi et al., 2012). Goodhue and Thompson (1995) created the TTF model, which focuses on the alignment of certain systems with specific tasks. The fit matches the capabilities of technology with the requirements of the task by measuring the degree to which the technology would assist an individual in performing a task (Robles-Flores & Antonio, 2012). The positive impact of technology can only be realized if there is a fit between the technology and the intended tasks to be performed (Goodhue & Thompson, 1995, as cited in Cane & McCarthy, 2009). According to Cane and McCarthy (2009), in the development of any technology, there are many factors that can influence its task-technology fit, such as data quality, authorization to access data, production timeliness, data compatibility between systems, and information systems developers' relationship with users.

The use of IT as an enabler of business improvement has been debated over the years. However, IT must be aligned with the business strategy of the organization in order to gain competitive advantage and to improve firms' performance (Wang, Liang, Zhong, Xue, & Xiao, 2012). IT has been implemented in EMR for viewing patients' records, capturing patients' vital statistics, and administering medication (Karsh et al., 2009). The system can also be used to improve the quality of health care through timeliness, accuracy of patients' information, and for tracking their records over time (Ferlie & Shortell, 2001, as cited in Karsh et al., 2009). However, the quality of health care in the application of EMR is contingent upon how the system is designed and the alignment with the tasks that it was intended to support (Holden & Karsh, 2009; Karsh, 2004, 2005; Karsh, Hamilton-Escoto, Beasley, & Holden, 2006; Karsh & Holden, 2006;

Karsh, Holden, Alper, & Or, 2006; Scanlon, Karsh, & Densmore, 2006, as cited in Karsh et al., 2009).

Health care issues are a subject of debate in the United States congress and senate. It is in the center of Affordable Health Care Act (Spruell, Vicknan, & Dochterman, 2010). The passage of the Health Information Technology for Economic and Clinical Health Act (HITECH) by the Obama Administration encourages the adoption of EMR to improve the quality of health care in the United States (Pipersburgh, 2011). The literature review that follows describes some of the factors that have affected the adoption of EMR and also addresses the research questions.

The review of literature in this chapter is focused on benefits of EMR. Moreover, it provides information on why several health care centers around the world have not fully embraced the new technology. I will examine the following seven categories: financial, technical, safety, time, social, legal, and organizational set up. Since the United States and Western world are the benchmark on which the EMR discussion is based, most of the literature written on adoption of EMR is based on information from these countries. However, some of the reasons associated with the adoption in the Western world will be used to explain the same situation in Nigeria. This chapter concludes with a recommendation and implication for practices in health care centers around the world.

Financial Benefit of EMR

One of the reforms of the Patient Protection and Affordable Care Act by the Obama Administration is to contain the cost of health care by the use of EMR system (Encinosa & Bae, 2011). Boonstra and Broekhuis (2010) showed that the cost of setting

up EMR was mostly reported among the barriers to adopting the technology in their practices. However, the business case for the adoption of the technology is that it has the potential to cut costs by reducing the length of stay in the hospital, reducing the demand for clinicians, and reducing inappropriate laboratory procedures (Furukuwa, Raghu, & Shao, 2010). Since the cost of setting up EMR is prohibitive, clinicians are worried about the ROI that they have made (Boonstra & Broekhuis, 2010). Boonstra and Broekhuis argued that it could take years before any return can be manifested. In spite of the high cost of purchasing EMR, the technology is widely believed by some circles that it would yield both financial and clinical benefit (Thompson & Fleming, 2008). Moreover, Thompson and Fleming (2008) argued that the benefits of the tool do outweigh the cost of implementation and maintenance.

In an attempt to encourage the adoption of EMR in the United States, the Bush administration proposed a plan that all medical records of the citizens of the country be fully computerized (Hoffman, 2009; Morton & Wiedenbeck, 2009). In support of the initiative of the Bush Administration, the HITECH Act of 2009, which is a portion of the American Recovery and Reinvestment Act of 2009, the Obama administration allocated some funds to health care providers as an incentive to encourage the adoption of EMR (Brooks & Grotz, 2010; Spruell et al., 2010). The fund allocations for EMR implementation as listed by HITECH are as stated below:

- $18 billion was allocated to the Medicare and Medicaid reimbursement for hospitals and physicians for “meaningful use” of EMR. A meaningful use is a requirement from the U.S. government that health care providers should be

able to exchange health care information by using EMR that has been designed to improve the quality of health care (Jones & Kessler, 2010). In addition, information should be summarized regardless of different vendors' systems, and for patients to be able to download their personal health information, control it, and send it to another provider, if necessary (Muntz, 2012).

- $2 billion was given to the office of the national coordinator to provide the necessary infrastructure such as facilitating data exchange, to share of information among health care center, and to integrate health IT into the training of health care professionals.
- $500 million was allocated for purchasing equipment services.
- $400 million was designated for research on the effective use of EMR and its impacts on health care treatments and strategies.
- $300 million was allocated to support the regional exchange of health care information, and
- $40 million was provided for Social Security Administration to use EMR to submit disability claims.

In spite of the HITECH stimulus money, Spruell et al. (2010) argued that some steps must be considered before investing in the implementation of EMR. Some of these activities as listed by Spruell et al. are as follows:

- Problem definition–What is to be accomplished with the purchase, including the assessment of project scope (partial of full implementation of EMR),

feasibility study, and physician cost during this period, such as physician and office manager's time reading, studying, and talking with vendors, loss of revenue during the meetings with vendors, and consultant fees.

- Site preparation–This includes hardware purchases, installation, and upgrades.
- Licensing fees, training costs, and maintenance fees.
- Training of staff and final preparation to go live.

Furukuwa et al. (2010) stated that the business case for investment in EMR is that it would eventually cut down the cost of health care, but they could not justify it in their experience. In their studies of EMR implementation at a California hospital from 1998 to 2007, they found out that the use of EMR increased the cost of treatment at the hospital. According to Furukuwa et al., there was an increase of 6% to 10% in the cost per discharge in medical acute units. These researchers argued that EMR may even lead to an increase in demand for skilled nurses, which would not necessarily lead to cost savings. Furukuwa et al. stated that they focused on EMR implementation in the first 3 years rather than the long-term effect. For this reason, they concluded that they could not generalize their findings as being applicable to other hospitals. Thompson and Fleming (2008) also argued that published information on the financial benefit on EMR does not have a common basis for comparison and that there are inconsistencies between studies regarding financial benefit of the technology.

Technical

A full adoption of EMR would make IT a critical component of helping hospitals to deliver health care (Boonstra & Broekhuis, 2010). However, Boonstra and Broekhuis (2010) argued that a lack of technical skills is one of the barriers to full adoption of EMR in health care settings. According to Boonstra and Broekhuis, a certain level of computer skills is required in order to master the complexity of hardware and software of EMR system. Boonstra and Broekhuis stated that EMR vendors may have underestimated the level of technical skills required by clinicians to master the use of the technology.

Boonstra and Broekhuis (2010) argued that clinicians' lack of technical knowledge to deal with EMRs may have contributed to their resistance to adopting the system. Some physician practices that have adopted EMR stated that going from [PBMR] to EMR was hard and challenging initially, but none of those practices was ready to go back to using [PBMR] (Atwal, 2011). According to Atwal (2011), these practices considered the readily available information of records in EMR system as beneficial to their settings.

Some physicians argued that EMR is unnecessarily too complicated or too limited in its capability when it was compared with a paper-based manual entry system (Boonstra & Broekhus, 2010). Other factors limiting the adoption of EMR as argued by Boonstra and Broekhuis (2010) are unfriendly complex screens, lack of standardization with respect to data exchange, and reliability of the system with respect to unexpected crash during the examination of patients. Higgins et al. (2012) echoed the difficulty of using EMR, stating that, after initial installation, it could take up to 1 year to reach a stable

utilization of the system. Of the three legislations (use of evidence-based learning, training, and change management support) stipulated by the HITECH Act, training was cited as very difficult for clinicians because of the complexity of deploying EMR (Fickenscher & Bakerman, 2011). Fickenscher and Bakerman (2011) argued that a scenario in which busy clinicians are being trained for several hours with a system that is unrelated to their practices could be challenging. The New York Health System that launched a $400 million EMR program is an example of an organization with a possible loss of productivity during the implementation (McGee, 2009). According to McGee (2009), one of New York Health System's staff asserted that they could lose about 10% to 15% in their productivity but was optimistic that they will catch up in little or no time.

Boonstra and Broekhuis (2010) opined that the complexity of hardware, software, and network deployment could be problematic when deploying EMR. New evolution in the deployment of EMR that would make it ubiquitous is cloud computing (Wenjun, 2012). Haag and Cumming (2010) as cited in Aljabre (2012), defined cloud computing as a computer model in which all services such as applications, backups, resources, and development tools are delivered over the Internet as hosted services. Wenjun (2012) defined cloud computing as the means of delivering computing services over the network. The national Institute of Standards and Technology also has its own definition as stated thus:

> [C]loud computing [is defined] as a model for enabling ubiquitous, convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications, and services) that can be rapidly

> provisioned and released with minimal management effort or service provider interaction. (National Institute of Standards and Technology, n.d., p. 10)

The reported importance of cloud computing and how EMR can leverage this concept will be subsequently discussed.

The downturn in the current economic climate has led to companies searching for alternative and affordable technology like cloud computing (Aljabre, 2012). The marketing growth as predicted by Forester Research is that it would reach about $241 billion by the year 2020 (Melnik, 2012). According to Melnik (2012), businesses would pay according to their usage. The author argued that some health care businesses are turning to cloud computing in order to reduce their cost of operation. In spite of the aforementioned benefit, businesses, especially health care, are concerned about the security risks of cloud deployment because of access to system via Web or online (Melnik, 2012). The concern on security and safety will be addressed in the safety section.

Melnik (2012) interviewed Online Tech, Inc. (an EMR vendor) by asking the company to explain their concerns on moving health information to the cloud. The vendor stated that health care organizations should allay their fear of cloud. According to Melnick, the company cited Children's Hospital Central in California which had leveraged cloud computing environment with success. Melnik stated that Online Tech did not minimize the threat of privacy in the cloud nor agree that vendors should be blamed for security breach and invasion of privacy. Will, Langvardt, Massey, and Rinehart (2011) echoed this sentiment on the tension between operational efficiency of the EMR

system and the patient's concern on their privacy rights on the proposed national health information network (NHIN). Although these authors acknowledged that the idea behind the network was to facilitate the exchange of patients' data, improve the quality of health care, and to reduce its cost, they are also concerned about the privacy of patients when data are transferred over the network.

Time

Some physicians have argued that the use of EMR has limited their focus on their patients since they spend more time on the technology rather than their patients (Smith, 2010). In a study of EMR adoption in Massachusetts by *American Medical Informatics Association,* 81% of respondents are reported to resist the technology because of fear of productivity loss (Etzioni, 2010). On the contrary, Calder (as cited in Smith, 2010), argued that the use of EMR has provided him with an opportunity to spend more time with his patients. The 2001 Institute of Medicine (IOM) on *Crossing the Quality Chasm* reported that timeliness is an area that needs improvement in health care management (Rosen, Spalding, Hannon, Boudreau, & Kwoh, 2011). Calder argued that the time that he saved by using EMR has allowed him to spend more time with his patients and as a result, was able to improve the quality of health care for them.

In a survey of parents of patients at pediatric rheumatology practice in Pittsburgh, Pennsylvania, in a month before implementation of EMR system, and 3 months after the implementation, Rosen, et al. (2011) reported that parents were satisfied with EMR usage. According to Rosen et al., parents of the patients agreed that EMR has improved the quality of health care of their children. Rosen et al. also stated that the parents of

those children were reportedly happy that doctors were able to spend more time with their children.

On the other hand, Haig (2010) argued that clinicians are spending too much time on EMR by looking out for the best-paying code rather than focusing more on patients care. Haig argued that the effort that one spends on entering and changing passwords every two months is a waste of time. According to Haig, IT takes too much time and energy from physicians and has prevented them from focusing on their patients. According to Boonstra and Broekhuis (2010), some physicians stated that they spent too much time on EMR per patient than they would normally spend on using [PBMR]. The physicians reportedly argued that it would be more efficient to use [PBMR] during the first clinical encounter with a patient. In this study, the focus is to explore the added value of time saving in the use of this technology in comparative qualitative studies of two major health care centers in Nigeria, in which one of them uses EMR, and another one that employs traditional paper-based manual entry.

Safety

Electronic medical record has been reported to have improved the quality of care for patients with minimal increase in the cost of health care system (Gilmer et al., 2012). The safety use of EMR as a technology that can reduce medical errors is also echoed by Crane and Crane (2008). Melendez (2012) noticed the failure of an EMR when the system processed some wrong data of patients when his team (Medical Device Integration Informatics) was trying to integrate patients' data from medical devices to the EMR at Brigham and Women's hospital and Massachusetts General Hospital in 2008.

Melendez and his team developed a scenario that was based on a day in the life of a patient's visit from admission to discharge. According to Melendez, his team was not sure whether buffered data from medical device (which were generated by network interruption) were loaded correctly into every patient record all of the time.

Loading incorrect data into patient records raises significant safety implications (Melendez, 2011). According to the Melendez, most EMRs today receive data from Health Level 7 (HL7) interface or terminal servers by location rather than by patient identifier (PID). Melendez argued that the use of location to identify patients would work under normal condition. Melendez stated that at Brigham and Women's hospital and Massachusetts General Hospital when a new patient was brought into a room after an interruption via network failure, he observed that the data buffered from previous patient was loaded into the new patient. Melendez and his team were able to resolve this issue by using a computer system that used PID to load the data, rather than using a medical device that identifies patients by location. Melendez advised that hospitals should use medical devices that identify patient with PID rather than the room location identifier. According to Melendez, data flow can synchronize with the correct patients' information on EMR if PID for patient's identification.

Harrington, Kennerly, Johnson, and Snyder (2011) also echoed their concern on EMR usage safety in their review of some literature from 2000 to 2009. These authors advised that health care leaders should try to understand the complexity of this technology, and to ensure that vendors comply with sound design, development, and on usage. They argued that stake holders should be aware of threats that can be introduced

during implementation of EMR from design to delivery. Harrington et al. (2011) argued that loss of data during system crashes, loss of connectivity, and keypad entry error can result in unintended consequences. While some of the issues on EMR are technologically related, safety issues on environment, process, and organizational set up are also of major concern (Harrington et al., 2011). These authors advised that leaders on the provider side should be involved in the maturation of EMR in order to realize the potential of the technology.

Legal

In spite of the strong backing of EMR by the Obama administration (Jones & Kessler, 2010), there are concerns about keeping medical records information safe. Boonstra and Broekhuis (2010) argued that physicians must be wary of the safety of medical information in order to avoid legal issues that could arise from it. Boonstra and Broekhuis stated that physicians are not sure if EMR is secure enough to prevent unauthorized users from accessing the data of their patients. The breach of confidentiality of patients' information was not taken lightly at University of California (UCLA)'s Medical Center (Mir, 2011). According to Mir, the hospital disengaged 13 of its employee (none were physicians) for unauthorized access to Britney Spear's confidential medical records (Mir, 2011). Moreover, Mir stated that, six physicians of the same medical center were also disciplined for "improperly" looking at Spear's medical record.

Social

In medical practices, physicians usually work with other parties such as vendors, insurance companies, patients, administrative staff, and other clinicians (Boonstra &

Broekhuis, 2010). According to Boonstra and Broekhuis, the decision to implement EMR by physicians is influenced by these parties, and this could also affect the relationship between physicians and their patients. The lack of support and technical training by vendor can be a barrier to the adoption of EMR systems (Boonstra & Broekhuis, 2010). According to these authors, the lack of competition in this industry testifies to the fact that the industry has not matured, and as such, many of these vendors could disappear before EMR systems get better. Some physicians also stated that their decision to adopt EMR was affected by local or regional organizations that were not active in EMR debate (Boonstra & Broekhuis, 2010). Other social issues such as insufficient computer skills and lack of training are reported to make EMR time consuming to use (Granlien & Hertzum, 2012).

Organizational Context

The setup of an organization's environment can affect the adoption of EMR (Boonstra & Broekhuis, 2010). According to Boonstra and Broekhuis, physicians in larger practices have a higher rate of adoption than smaller ones. Boonstra and Broekhuis also argued that, larger practices do have better technical support, and are more likely to use many of the functions in EMR than that of smaller practices. Larger practices have financial resources as well as having stronger organization resources than smaller practices, and as such, are more likely to adopt EMR than would a smaller organization (Boonstra & Broekhuis, 2010).

Alternate Methodologies

Research methodologies employed in previous task-technology fit theory had mostly used quantitative approach. For example, Aiken, Gu, and Wang (2013) conducted a quantitative research on how task knowledge and task-technology fit can be applied in a virtual team. Cane and McCarthy (2009) examined various research methodologies that were used to explain task-technology fit. Venkatraman (1989) (as cited in Cane & Mccarthy, 2009) addressed this theory in *fit as a matching*, which is one of Venkatraman's six perspectives fit. According to Venkatraman, this is a quantitative approach where "fit is derived on theory independent of performance, then, tested for performance impact" (Cane & Mccarthy, 2009, p. 108). Lending and Straub (1997) (as cited in Cane & McCarthy, 2009) conducted a longitudinal experiment in their qualitative research on task-technology fit theory as a follow up to Goodhue et al. (1997). This study was predicated on ethnographic interviews where subjects were questioned on (1) task descriptions, (2) use of technology for tasks, (3) the fit of the technology, and (4) whether the fit of the technology influenced their choice of use.

Researchers do employ various methods for data collection (Denscombe, 2003). However, each method used has its strength and weaknesses (Denscombe, 2003). For this reason, Denscombe argued that researchers should decide on the method that is appropriate to their studies, rather than looking for superior method of data collection. According to Denscombe, four research methods, such as questionnaire, interviews, observations and document "can be seen as competing with each other" (p. 131). According to the author, since these methods are different, their applications are suited to

some situations than the others. However, there are times in which the methods are complementary (Denscombe, 2003). According to Denscombe, the application of more than one method of investigation in any studies is predicated on each method having its own assumptions about the study, and the corresponding data to support it in, order to enhance the knowledge about the world. Denscombe argued that, using multi-methods to collect different data on the same topic could lead to more data collection, and consequently an improvement in the quality of the research.

Using multi-methods can lead to corroboration of findings and to also to validate data collection (Denscombe, 2003). In spite of this, Denscombe warned that, the use of multi-method does not guarantee that the researcher is correct, but it increases confidence in the meaning and consistency of data across methods. According to Denscombe, any new comer into research should consider the following:

- Researchers should attempt more than one method in their studies, if possible.
- Using multi-methods can enhance quality of data.
- A single social reality can be controversial, and as such, researchers should avoid any naïve use of triangulations.
- Researchers should embrace different methods, since they are likely to point to a similar direction.
- Researchers should not presume that methodological triangulations can prove that the data or analyses of the data are absolutely correct.

Summary

The health care industry has recognized the importance of EMR as a device that can be used to reduce medical errors, increase productivity of staff in the delivery of health care services, and to improve the quality of health care. In spite of these recognitions, there are several hospitals and health care centers that have not fully deployed the technology. Some of the reasons given for non-deployment are, lack of funding, infrastructural problem as in the case of Nigeria, where constant interruption of electricity is prevalent, lack of technical knowledge or support, and various non-standardization of medical records structures for data exchanges.

In spite of the aforementioned barriers to deployment of EMR, some health care centers that have deployed the technology are taking the advantages of the system. The Europeans, especially the western part are ahead of the United States in their rate of deployment, but the United States government has mandated that all health care centers must have their manual entry records converted into electronic medical records by 2014. Although EMR has been thought of as a device that could save time over traditional manual data entry, there has not been any research that compares any time saved on manual data entry with that of EMR. Accordingly, the goal of this research is to explore whether EMR has actually save time, and whether the saved time has also been used to take care of patients.

Chapter 3 contains a description of the methodology for data collection and analysis.

Chapter 3: Research Method

The purpose of this research was to explore by qualitative means how EMR implementation in one hospital has affected the time that doctors spent with their patients in comparison with the hospital that uses only PBMR in Nigeria. I have selected case-study methodology to seek answers to my research questions to compare a case in which PBMR were used and a case in which an EMR system was used to address whether any time saved during treatment of patients by their physicians has been used to provide further care for patients. By examining the healthcare delivery systems of Ekiti State University State Teaching Hospital (EKSUTH) and General Hospital Isolo (GHI), I was able to assess the time spent on medical records and time that physicians spent with their patients. In this chapter, I will describe the research design and rationale, role of a researcher, methodology, data collection procedures, data analysis, issues of trustworthiness of this study, and a summary.

Research Design and Rationale

I conducted these multiple case studies in order to gain firsthand experience with respect to how EMR has influenced the time that patients spent with their doctors and to explore how the technology has improved the quality of healthcare in Nigeria. I conducted a face-to-face (FTF) interview at two different hospitals in Nigeria. Literature on EMR has mostly been focused on the benefit of EMR such as the cost of implementation, integration, training, and technical issues. Calder (as cited in Smith, 2010) stated that EMR has enabled him to save time and thus he was able to spend more time with his patients. According to Calder, by spending more time with his patients, he

was able to improve his quality of care. On the other hand, Haig (2010) did not see EMR as a time saving device. He argued that clinicians spent too much of their time looking for the best payment-code rather than focusing on patient's care.

A comparative case study was considered the most appropriate method for this study. Qualitative research allows more freedom than other approaches and allows the researcher to adjust the process as the project develops. For example, the initial plan for research is difficult to prescribe, and the process can be changed or modified, because it "points beyond the object immediately at hand" (Moses & Knutsen, 2007, p. 139). In this research, I have explored how the use of EMR has impacted the time that physicians at GHI spent with their patients and compared it with EKSUTH, a hospital that does not deploy the technology. This type of comparison is consistent with qualitative research method. The units of analysis in quantitative research are numbers, whereas qualitative research uses words or visual images for unit of analysis (Denscombe, 2010). Therefore, I adhered to use the unit of analysis that was consistent with qualitative measurement in this study

Role of the Researcher

The qualitative tradition is predicated on interpretivism and constructivism, both of which evolved from the idealist outlook (Deshpande, 1983; Sale et al., 2002, as cited in Slevitch, 2011). Idealism is an ontological view which asserts that reality is dependent on one's mental structure and activity (Guba & Lincoln, 1994, as cited in Slevitch, 2011). Smith (1983) as cited in Slevitch (2011) opined that multiple existences of realities are based on one's constructions and interpretation of reality. Moreover, "reality is being

recreated continuously by its participants' intersubjective understanding of it" (Hellstrom, 2008, as cited in Slevitch, 2011, p. 77).

According to Putnam (1981) as cited in Slevitch (2011), reality is mind-dependent, and as such cannot be free from one's point of view. My role in this study was that of an objective viewer. To attenuate or mitigate the influence of my view, I did not make any assumptions about my participant's views. For example, my perception of medical doctors in Nigeria was that they are more likely to distort their responses in order to look good. However, this preconceived notion did not affect my interpretation of their responses.

People participating in research or conducting it do have their own "set of biases and prejudices" (Trochim & Donnelly, 2008, p. 123). According to Trochim and Donnelly (2008), some of these weaknesses are social desirability, distortion of interview, and false responses by the participants. Some participants may not like to embarrass themselves and could respond in order to appear socially desirable to the interviewer and others (Troching & Donnelly, 2008). To avoid spinning any responses, I repeated my questions for clarity and ensured that my respondents were comfortable with the questions that I asked them.

Furthermore, I communicated the importance and the purpose of the study to the respondents in addition to ensuring their anonymity. Sometimes, researchers can also distort interviews by not asking difficult questions or ones that could make the respondent uncomfortable (Toching & Donnelly, 2008). Since my research objectives were very clear, I did not distort any questions. Moreover, "all questions were written

beforehand, [and I asked them] in the same order for all respondent" (Singleton & Straits, 2010, p. 266) in order to ensure the reliability of the data that I collected (Singleton & Straight, 2010). Data reliability was further enhanced by sharing the interview results with the interviewees to make sure that their responses truly reflected their views. Data consistency was confirmed by the technique of triangulation involving a cross-check of the interview and questionnaire responses of participants. Since it was not possible to me to predict the sample size in advance, a theoretical threshold or saturation determined whether the sampling was complete. Data saturation entails bringing in new participants until redundancy in data collection is observed (Marshall, Cardon, Poddar, & Fontenot, 2013). In this study, data saturation was assessed, starting from the 10^{th} participant at EKSUTH and the 11^{th} participant at GHI.

Methodology

Participant Selection Logic

Research participants for this research study were patients and doctors from two different hospitals in Nigeria. One of these hospitals was using EMR, while the second hospital focused on paper-based medical record. Most doctor participants at EKSUTH did not have any experience with EMR, whereas all doctors at GHI have used EMR. In my selection, I recruited 12 doctors and 12 patients at EKSUTH; I also recruited equal numbers of participants at GHI. In other words, there were a total of 48 participants for this study.

Inclusion Criteria

Participants were selected to be part of this study because they belonged to a group that either was identified as a patient who was in the patients' waiting room of the Outpatient Department or an attending doctor in the Outpatient Department. In addition, the participants were selected because they were adults who (a) came to the hospital on their own, (b) came to the hospitals without police escort, (c) were not on sick bed, (d) were able to express themselves in the English language, or (e) were doctors who were general practitioners in the outpatient department.

Exclusion Criteria

I excluded non-English speakers, friends, relations, and business associates from this study. Moreover, those who did not want to be recorded were excluded.

Instrumentation

Singleton and Straits (2010) argued that sampling and interview instruments are vital to successful survey research. They stated that generalizations about a population depend on the quality of the samples used. To collect research data, four basic interview methods can be used: FTF, telephone, computer-assisted self-interviews, and paper-and-pen questionnaires. Other methods of data collection as stated by Singleton and Straits include observation and examining public or private documents. The data collection methods used are briefly described below. The interview guides for this study can be found in Appendix A and Appendix B.

The method of data collection that I used for this study was FTF interviews. According to Singleton and Straits (2010), one of the advantages of the FTF interviews is

that the interviewer can restate questions that are not clear to the respondents. I ensured clarity by restating my questions to my participants. Singleton and Straits argued that the interviewer can unobtrusively observe an area of interest to the researcher. On the other hand, FTF interviews can be costly if informants are geographically dispersed (Denscombe, 2010). According to Denscombe (2010), the use of an audio recorder in FTF interviews can inhibit an informant who may not feel comfortable being recorded.

Procedure for Recruitment, Participation, and Data Collection

This study entailed an examination of two major health care centers in Nigeria. One of these hospitals was a center that has fully deployed an EMR system, while the second one was using paper-based manual entry. Privacy policy standards in the United States stipulate that health information of individuals must be protected and that access to that information must be restricted (Kempfert & Reed, 2011). This research did not require access to patients' data from the two hospitals in Nigeria. As such, I did not seek permission to have access to patients' healthcare information.

I used nonprobability purposive sampling for participant selection in this study. Frankfort-Nachmias and Nachmias (2008) stated that nonprobability sampling does not guarantee that every unit of the population will have some chance of being included in the sample. However, the authors wrote that probability sampling is characterized by a sampling size in which every individual has an equal chance of being selected. Having equal access to a target population would engender the use of probability sampling. However, I conducted the nonprobability purposive sampling method because it was impractical to select a sample that was large enough to be a probability sample.

The three major nonprobability sampling techniques employed by social scientists are quota samples, purposive samples, and convenience samples (Frankfort-Nachmias and Nachmias, 2008). In this study, time was of the essence, and for this reason, I used purposive sampling. This technique allows the researcher to select "sampling units that appear to be representative of the population" (Frankfort-Nachmias & Nachmias, 2008, p. 168). For this study I interviewed 12 patients and 12 doctors from each hospital; moreover, I conducted the interviews from September 15 through September 26, 2014.

In conducting my research, I was provided with a private room in each hospital. I recruited all my participants from the Outpatient Department (OD) of the hospitals. In Nigeria, an OD is where all patients meet to see doctors (general practitioners) before they are directed to specialists if necessary. This is similar to visiting a primary doctor in the USA, where he or she will determine the cause of treatment and then will refer the patient to a specialist if necessary. In these interviews, there were no conflicts of interest because I did not interview any relations, friends, or business associates. To avoid any disruption of the patients' visits to the hospital, I conducted my interview after my participants had seen their doctors. Moreover, I told participants to review the concept form and to bring it back after a couple of days. However, some decided to complete the interview immediately while a few others returned the next day. During the interview, I did not ask any participant any personal questions, and I told that them that they reserved the right to terminate the interview at any time, should they feel uncomfortable. Moreover, I told my participants (patients and doctors) that upon the conclusion of my

study, I will share the results of my findings in a one to two page summary via email upon request.

Since it was difficult to know the best time to interview any of the doctors, I approached those who had authorized the research to provide me with the best time to meet in OD so that I could explain to them the reasons for my interview. I was told that doctors would not be able to give a specific time, and that they would come to my interviewing room whenever they were on breaks. However, I was able to give consent forms to the doctors at OD who were willing to participate in the interview. In response to my request, physicians came to the interviewing room periodically for an interview. I reported to GHI and EKSUTH every day at 6:00 AM and left at 5:00 PM. While OD patients at both hospitals came around 6:00 AM, doctors' schedules were between 8:00 AM and 4:30 PM.

During the interview, I advised participants that their identity would be kept confidential and that the recorded interview would be kept in a locked file cabinet in my home for 5 years. Moreover, I told them that the electronic files of the document would be password-protected in my computer, and the password would only be known to me. Furthermore, I told them that the document file would be backed up to a thumb drive that would also be locked with the records of the interview in a locked file cabinet for 5 years. I told my participants that their privacy would be strictly enforced according to the United States government rules and Walden University' Institutional Review Board (IRB).

Data Analysis

The data collected for this study were analyzed with Nvivo 10, using automatic coding as suggested by Robertson (2014). According to Robertson (2014), automatic coding allows for "broad-brush" coding for large volumes of textual data, which a researcher can later review and refine for further analysis. Automatic coding is also used to predetermine elements of source materials (Edhlung & McDougall, 2012). There were two interview schedules that I used for this research: one for doctors and another one for patients. I merged the responses of doctors from both locations to draw a comparison in their responses. I did the same for patients for comparative analysis. I identified categories from the interviews scheduled. I identified themes by finding similarities on how participants expressed their responses. The tables that identify the frequency of responses (themes) to questions (categories) can be found immediately in their respective categories. Merriam (2009) stated that researchers can make sense of their data by including the process used to provide answers to their research questions.

Issues of Trustworthiness

Patton (1999) argued that the quality and credibility of qualitative analysis could be enhanced by applying rigorous technics to the method of gathering and analyzing qualitative data. According to Patton, researcher must pay attention to validity, reliability, triangulation, and credibility. Issues of trustworthiness of this research were demonstrated with my discussion on credibility, transferability, dependability, and confirmability.

Credibility

Credibility of a research study can be established by conducting the research in a manner that is believable (Hougton, Casey, Shaw, David, & Murphy, 2013). Triangulation of qualitative data sources entails "cross-checking the consistency of information derived at different times, and by means within qualitative methods" (Patton, 1999, p. 1195). According to Patton (1999), this approach compares observational data with interview data. I thus validated my data by cross-checking my interviews with the responses of participants during and after the interview.

Transferability

Transferability or external validity is predicated on how a particular study can be applied to other situations (Merriam, 2009). Merriam (2009) stated that "applying generalizations from aggregated data of enormous random samples to individuals is hardly useful" (p. 224). Therefore, my findings in this study cannot necessarily be transferred to another groups or settings. According to Merriam, rich and thick description is a strategy that is used to enable transferability of a study by presenting a detailed description of findings with adequate evidence in the form of quotations from a participant interview. I provided several quotations sufficient description of my research findings through quotations.

Dependability

Trustworthiness of a study can also be increased by the concept of dependability or reliability. Dependability or reliability refers to the stability of research data over a period of time (Hougton, Casey, Shaw, David, & Murphy, 2013). An audit trail entails

maintaining comprehensive notes and using software like Nvivo to confirm findings (Hougton et al., 2013). Bassett (2009), Bergin (2011), and Silverman (2010) stated that Nvivo can be used to preclude excessive emphasis on seldom occurring findings to advance the researcher's preferred argument (as cited in Hougton, et al., 2013). Koch (1994), Koch and Harrington (1998), Johnson (1999), Jootun et al. (2009), and Rodgers and Cowles (2013) argued that expression of reflexibility can be demonstrated by maintain a reflexive (as cited in Hougton et al., 2013). Hougton et al. (2013) stated that a reflective diary containing thoughts and ideas documented during data collection can enhance dependability. According to these authors, reflexibility can help in the development of themes and subthemes in data analysis.

Confirmability

According to Tobin and Begley (2004), confirmability, which is also close to dependability, refers to an unbiased presentation of data in a research study (as cited in Hougton, Casey, Shaw, David & Murphy, 2013). Hougton, Casey, Shaw, David and Murphy stated that by locating issues described in research findings, it can be ascertained that the perception of one person is also consistent with some other participants in a particular study.

Ethical Procedure

Healthcare providers are obligated to respect patients' privacy and to assure their confidentiality (Lin et al., 2013). I was aware of Walden University's guidelines on ethical practices, and I have read them. I have also taken on online course (and received a

certificate) on research ethics by the National Institutes of Health as required by Walden University prior to submitting my proposal to the University Research Review (URR).

The ethical considerations for this research included informed consent letter that were physically distributed to participants. This letter contained my identification, the sponsoring organization, benefits of participating, and the extent to which a participant can be involved in my interview. Participants' right of refusal to participate was also included in the consent letter. In the informed consent letter, I included the purpose of the study, risks and benefits, the right to terminate the interview without any penalty, if they felt that they could no longer participate in the interview. It was also noted in the informed consent form that the interview will be recorded. Moreover, the informed consent letter also indicated that participants will not be compensated for participation. I did not compensate any participants who were interviewed for this study. The approval number from the Institutional Review Board (IRB) to conduct this research is 08-20-14-0068452. This approval number was contained in the informed consent letter. A copy of the informed consent letter can be found in Appendix C.

Although the following information were also included in the informed consent form that were given to the participants, I also emphasized it before the beginning of my interview. I advised participants that any information that they will provide me will be kept confidential, and that I will not include their names or anything else that could identify them in my research report. Moreover, I stated that their data will be kept

secured with numerical coding and will be password protected for 5 years, and that information will be shredded when that time expires.

Summary

I have discussed my proposed method, a comparative case study of two hospitals in Nigeria, and how the research method was carried out. The chapter also covers the instrumentation, mode of observation and data collection method that I used for the research. I have described my sampling procedure and data analysis as well as my choice of software (Nvivo 10). I have also discussed how I will protect the identity of all participants that I interviewed. Finally, I discussed issues of trustworthiness and the ethical procedure to protect the identity of participants. In Chapter 4, I will discuss the results of this research study.

Chapter 4: Results

The purpose of these case studies was to explore by qualitative means how EMR implementation has affected the time that doctors spent with their patients in comparison with the traditional method of patients' record keeping. Calder (as cited in Smith, 2011) stated that the use of EMR has saved him from going through endless paper charts, and that this has allowed him to spend more time with his patients. By spending more time with his patients, Calder stated that he was able to provide better care for them. Other physicians have argued that the use of EMR has limited their focus on their patients since they spend more time on the technology rather than their patients (Smith, 2010). I conducted these studies to explore how EMR has influenced the time that doctors spent with their patients, and how it has impacted the quality of care in Nigerian's hospitals. Research questions that were explored in these studies were the following: (a) How does the use of EMR influence patient-processing time in Nigeria? (b) How does the use of EMR in the treatment of patients impact the quality of healthcare in Nigeria? (c) How does the use of EMR influence patients' access to their healthcare information in Nigeria? In this chapter, I have included a description of the research settings, demographics, data collection, data analysis, evidence of trustworthiness, results, and summary.

Research Settings

The main interviews for these case studies were conducted at two separate hospitals: EKSUTH and GHI. The former hospital is located in Ado-Ekiti, Ekiti State while the latter one is situated in Isolo, Lagos State. EKSUTH is a 368-bed hospital, and

it is the largest in Ekiti State. GHI is 165-bed hospital, and it is one of the several state-owned hospitals in Lagos State. The hospital with EMR and PBMR are GHI and EKSUTH respectively. Upon request, each hospital provided me with a private room to conduct my interview. The privacy accorded my research participants was to avoid anything that could influence their participation.

Demographics

Participants' demographics for this research included the gender and locations of participants. The demographic factors are as shown in Table 1 and Table 2. All participating doctors are general practitioners in the OD at GHI and EKSUTH in Table 1. Table 2 lists the demographic factors of patients who took part in the interview at the aforementioned hospitals.

Table 1

Demographic Factors of Research Participants (Doctors)

Participants	Location	Males	Females
12	GHI	8	4
12	EKSUTH	11	1

Table 2

Demographic Factors of Research Participants (Patients)

Participants	Location	Males	Females
12	GHI	4	8
12	EKSUTH	5	7

Data Collection

There were a total of 48 participants for this research study. I collected data from 12 doctors and 12 patients at GHI. I also collected data from 12 doctors and 12 patients at EKSUTH. I conducted these interviews from September 15 to September 26, 2014. The consent form was distributed on the first day of my visit to each hospital. Some of the patients decided to participate in the interview on the first day at the end of their consultation with their doctors. They stated that they had enough time to review the consent form because they had been waiting for a while before they could get to see their doctors. Some chose to come back the next day because they had some tests to be done at some private laboratories outside of the hospitals and returned the following day or during the week. According to one of the patients, most tests are not done directly in hospitals, and patients may have to return the following day or at a different time for further treatments. Doctors who participated in the interview came into my private room at various different times for an interview. The interviews, which were recorded for each participant, lasted for an average of 30 to 35 minutes. I stayed every day at each hospital from 6:00 AM until 5:00 PM, with 30 minutes each day for a lunch break. Although

doctors' scheduled time is between 8:00 AM and 4:00 PM in the OD, patients usually came as early as 6:00 AM.

In this study, I employed nonprobability purposive sampling in selecting my participants, which appears to be representative of the population (Frankfort-Nachmias & Nachmias, 2008). The interviews were very intensive, and they were digitally recorded. The room that was provided for me at GHI was around the corner of the medical records department of the hospital, and it was air-conditioned, which was a welcome relief from high temperature of the OD. EKSUTH also provided a private room, not too far away from their OD, but it was not air-conditioned. However, the room had a noisy ceiling fan, and as such, I had to speak a little bit louder to ensure that my participants could hear me better.

During the course of the interview at GHI, one of the participants stated that he could no longer continue with the interview because he was too tired. He stated that he had been waiting for too long for treatment. Moreover, he added that he wanted to go home quickly before the traffic got too busy. I obliged, and I tore the consent form in front of him, and as such, the person's record was not included in my data. There was another doctor at GHI who was very interested in this interview. She spoke to me about EMR and how it would be nice to have it deployed at every government hospital. She promised to talk with me the following day; however, she did not show up for the interview. She left a message for me that she had to take care of her 3-year-old son.

In my interview at EKSUTH, one of my participants changed her mind before I started the interview. She stated that she did not want to be recorded because she thought

I could be a government agent. However, she spoke about how EMR would have prevented the situation of missing case notes in the hospital. She opined that some of those missing case notes were probably done on purpose by the medical records department to punish unruly patients. This patient's information was not recorded and it was not included in my data. Another would-be participant at EKSUTH, after reading my consent form, simply returned it and told me that he was not interested. My interview instruments for both patients and doctors are in Appendix A and Appendix B respectively.

Data Analysis

Report Process Used

The data collected for this study were analyzed using automatic coding as suggested by Robertson (2014). According to Robertson, automatic coding allows for "broad-brush" coding for large volumes of textual data, which a researcher can later review and refine for further analysis. Automatic coding is also used to predetermine elements of source materials (Edhlung & McDougall, 2012). There are two interview schedules that I used for this research: one for doctors and another one for patients. I merged the responses of the doctors from both locations to draw comparisons in their responses. I did the same for patients for comparative analysis. I identified themes by finding similarities on how participants expressed their responses. The tables that identify the frequency of responses (themes) to questions (categories) can be found immediately after their respective categories. Merriam (2009) stated that researchers can make sense of their data by including the process used to provide answers to their research questions.

Evidence of Trustworthiness

To enhance the quality and credibility of qualitative analysis, Patton (1999) stated that a qualitative researcher should apply rigorous techniques to the method of gathering and analyzing qualitative data by paying attention to validity, reliability, triangulation, and credibility. Evidence of trustworthiness of this research will be demonstrated with my discussion on credibility, transferability, dependability, and confirmability.

Credibility

Credibility of a research study can be established by conducting the research in a manner that is believable (Hougton et al., 2013). I established credibility by repeating my questions to be sure that that they were clear. I also advised my participants to take their time to answer my questions. Furthermore, I established credibility by assuring participants of their confidentiality since they were with me alone in private rooms to ensure that they could speak their minds without any distractions. By providing them with a copy of the consent forms, I advised participants that, should there be any concerns, they could contact Walden University. The credibility of the interviews was also assured in that I interviewed professionals (medical doctors) and patients who could express themselves in the English language. I also improved the quality of this study by the method of triangulation. Triangulation of qualitative data sources entails "cross-checking the consistency of information derived at different times, and by means within qualitative methods" (Patton, 1999, p. 1195). According to Patton (1999), this approach compares observational data with interview data. I thus validated my data by cross-checking my interview with the responses of participants during and after the interview.

Transferability

Transferability or external validity is predicated on how a particular study can be applied to other situations (Merriam, 2009). Merriam (2009) stated that "applying generalizations from aggregated data of enormous random samples to individuals is hardly useful" (p. 224). Therefore, my findings in this study cannot necessarily be transferred to another groups or settings. However, I presented several quotations from participants to enable transferability. According to Merriam, rich and thick description is a strategy that is used to enable transferability of a study by presenting a detailed description of findings with adequate evidence in the form of quotations from a participant interview.

Dependability

Trustworthiness of a study can also be increased by the concept of dependability or reliability. Dependability or reliability refers to the stability of research data over a period of time (Hougton, Casey, Shaw, et al., 2013). Dependability of this research study was achieved by audit trail. Audit trail entails maintaining comprehensive notes and using software like Nvivo to confirm findings (Hougton et al., 2013). Bassett (2009), Bergin (2011), and Silverman (2010) stated that Nvivo can be used to "[guide] against excessive emphasis on rare findings that happen to suit the researcher's preferred argument" (as cited in Hougton et al., 2013, p. 15). Koch (1994), Koch and Harrington (1998), Johnson (1999), Jootun et al. (2009), and Rodgers and Cowles (2013) argued that expression of reflexibility can be demonstrated by maintain a reflexive (as cited in Hougton et al., 2013). Hougton et al. (2013) stated that a reflective diary containing

thoughts and ideas documented during data collection can enhance dependability. According to these authors, reflexibility can help in the development of themes and subthemes in data analysis. Thus, I kept a reflective journal to assist me in the development of categories and themes in my research study.

Confirmability

According to Tobin and Begley (2004), confirmability, which is also close to dependability, refers to an unbiased presentation of data in a research study (as cited in Hougton et al., 2013). To increase the quality of this research study, I kept a reflective journal to alert me to any biases or strong positions in my views.

I further established confirmability of this research by running queries to locate passages and phrases. Hougton et al. (2013) stated that by locating issues described in research findings, it can be ascertained that the perception of one person is also consistent with some other participants in a particular study.

Study Results

In my first analysis, using Nvivo 10, I prepared for structural auto coding. The transcribed data were later categorized. After thoroughly examining my data, I revised my categories, and I applied thematic coding, which revealed recurring themes and patterns. Responses from each hospital were considered separately because I used two different interview schedules: one for doctors and another one for patients. Responses for patients at EKSUTH and GHI were compared and summarized in tables. I did the same for responses from doctors at the two different locations.

In the tables that follow, I identified patients and doctors at EKSUTH and GHI as indicated below:

1. EK-PDx–Doctor participants at EKSUTH; "x" is the participant number among the doctors. Thus, EK-PD1 is Participant Number 1, who is a medical doctor at EKSUTH. The same analysis is applicable to Item #2.
2. GH-PDx–Doctor participants at GHI.
3. EK-PPx–Patient participants at EKSUTH; "x" is the participant number among the patients. Therefore, EK-PP1 is Participant Number 1, who is a patient at EKSUTH. The same analysis is applicable to Item #4.
4. GH-PPx–Patient participants at GHI.

The categories that emerged from the analysis of all my three research questions will be discussed after all other categories derived from the interview schedules have been analyzed. The following categories were created from the Appendix B interview schedule that targeted to participants who were medical doctors.

Impact of EMR and PBMR on Number of Patients Treated Per Day

Participants were asked to describe how the use of EMR and PBMR has influenced the number of patients that they attended to, on a daily basis. Participant EK-PD2 stated the following:

> Using [PBMR] is our normal schedule. Really, it does affect the number of patients that I see. If we use EMR, I feel that we will be able to spend more time with patients and still be able to see more patients. If patients had completed their registration with EMR, we would have been able to spend more time with them.

> The use of [PBMR] has negatively affected the time that I spent with my patients. I spent more time looking for missing case notes rather than attending to patients. (personal communication, September 18, 2014)

Participant EK-PD1 had an opposing view. Participant EK-PD1 had this to say:

> Actually, [PBMR] is what we are used to. To some extent, we have been coping with it, and it has been giving us the result that we needed. On an average, I do see 16 patients per day. The use of [PBMR] has not really affected the number of patients that I see on a daily basis. (personal communication, September, 18 2014)

Participant EK-PD10 stated that PBMR has not influenced the number of patients that he normally saw in one day. Opinions varied among doctors at EKSUTH, based on each doctor's personal experience. One doctor (Participant EK-PD8) stated that he has used EMR software at a private hospital. Most doctors at EKSUTH claimed that they have heard of the software in seminars that they have attended; however, they stated that they have not actually used the software. Participant GH-PD11 from Lagos stated the following:

> It depends on the activities of the months. On an average, one can see from 15 to 35 patients per day. Based on Nigeria peculiarity, we are used to [PBMR] for a long time. We were not trained on the need for EMR, so when I started using it, I was not consistent with it because of the nature of our job here. I have problems with the software. At times, I wanted to save, and I would not be able to save what I typed in. Then, there was a power outage. And when there was a power outage, I could not go any further. I told the IT department to give us a laptop or

tablet that we can use. Since I had to start all over again when there was a power outage, I decided to abandon it. EMR is time-consuming. They expect me to type information, and they also wanted me to write it down when there is a power outage. I cannot do both of them at the same time. EMR is a laudable idea, because you can use it to keep a lot of information rather than too many cards or case notes. With [PBMR] you have to start searching forever, for example, if you have a patient who has regularly been visiting, say for five years, I believe that EMR can be helpful here. But in my own experience on [PBMR], the number of patients that I see in day has reduced significantly, especially, especially when we have to look for missing case notes before treating my patients. (personal communication, September 26, 2014)

Participant GH-PD7 had this to say:

Well, I am a kind of doctor that loves changes. Since the introduction of EMR in medical practice at Isolo [GHI], it has not been helpful in terms of the number of patients to be attended to on a daily basis, particularly in government hospitals, where we have a large number of patients. To try to diagnose patients takes some time, and to me, I don't think we are ready for [EMR]. I wish there is a better way to make me work faster. Anyway, on an average, I can see up to 25 or 30 per day. (personal communication, September 25, 2014)

GH-PD10's opinion is as indicated below:

On an average I see about 20 patients. This hospital (GHI) uses EMR, and the name of the software is eHealth. It is a welcome development, and I would say it

> is impressive that we have eHealth. The system is still developing, and we know it can get better. We do not have every patient on eHealth. As they came, we have been gradually entering their information in EMR, and it has helped to ease retrieval of patients' information. It has also helped in issues that happened where you have to search for information about patients. Patients can be seen in any General Hospital in Lagos, in as much as the information is in eHealth. I must say there are little challenges, but they are being worked on. Using EMR entails that you type and all that, which is something new. Doctors are used to writing on paper. That has decreased the time that we actually spent with patients. I would say, even when we use it, we still document on case notes paper. We do this because of power supply, and when there is a power failure, you want to be able to have access to your case notes. What I am saying is that we duplicate information on paper and EMR. I am conversant with [PBMR]. I find it easier to document on paper. I would prefer to write my case notes before I entered it into EMR. Because of this, there is a slight increase in the time that you spent with the patient, which is mostly spent on trying to figure out eHealth. (personal communication, September 26, 2014)

According to GD-PD10, the increase in time spent with patients was not necessarily devoted to patients. Most of it had to do with working on the software and writing case notes on paper at the same time. Table 3 is a summary of responses from participants.

Table 3

Impact of EMR or PBMR on Number of Patients Treated Per Day

Responses from participants	Frequency as stated by participants at EKSUTH	Frequency as stated by participants at GHI
EMR has negatively affected the number of patients that I see in a day	-	4
EMR has positively affected the number of patients that I see in a day	1	3
EMR is faster than PBMR for data retrieval	-	2
Neither EMR nor PBMR has affected the number of patients that I see in a day	-	3
PBMR has not affected the number of patients that I see in a day.	5	-
PBMR has negatively affected the number of patients that I see in a day	6	-
I can get my information faster on PBMR than EMR	-	1
We need more trainings before we can assess EMR capability	-	1

Impact of EMR and PBMR on Easy Retrieval of Patients' Information

Participants at EKSUTH and GHI complained that getting information from PBMR can be difficult, especially when case notes are missing. Participants were asked on how EMR or PBMR has been effective in retrieving patients' information after their second or subsequent visits to the hospitals. Participant EK-PD1 had this to say:

> Well, at times, [PBMR] is useful if you can get the case note. In some instances, you find out that case notes may be missing. And if they are missing, all the things that we have documented are lost. If you find the case notes, then, you can flip through and get your documents and proceed with treatments. In some instances, [case notes] may have been lost at the medical record department, and then, you are back to square one. This is disappointing, and it has given me a lot of stress. (personal communication, September 18, 2014)

Participants EK-PD7 echoed EK-PD1's frustration with PBMR and responded thus:

> You know, I see about 15 to 20 patients on a daily basis. The use of [PBMR] has affected the number of patients that I see in a day because it takes a lot of time to write down things and sorting papers. It consumed a lot of time that I could have been using for consultation (person communication, September 19, 2014).

Participant GH-PD2 stated that:

> What EMR does is that, with the click of a button, you can get the last information on a patient very fast. It saves you from missing files or case notes. With [PBMR], where some case notes are missing, you would not be able to get the information that you need to treat patients. With EMR, you can get the information that you need for a follow-up treatment. (personal communication, September 15, 2014)

Table 4 is a summary of responses from participants at EKSUTH and GHI.

Table 4

Impact of EMR and PBMR on Easy Retrieval of Patients' Information

Responses from participants	Frequency as stated by participants at EKSUTH	Frequency as stated by participants at GHI
There is no issue with retrieving patients' information in PBMR	3	-
Retrieving patients' record in PBMR is tedious	5	1
Retrieving patients' records in EMR is faster	1	9
There are too many cases of missing case notes or files in PBMR	7	3

Reason for Repeated Visits

Participants were asked to describe why patients returned for the same treatment that they have recently rendered. Participant EK-PD1 stated the following:

> Most of the time, we tell them to come back in 2 weeks for follow-up treatment. For example with malaria fever, once they are treated, they are treated. In some cases, when patients did not comply with medication or take the number of dosages that I prescribed, they would come back for further treatment on the same ailment. At times, it could be because of some resistance to a particular drug. But it is quite rare. The commonest sickness in this part of the world is malaria fever and typhoid fever. For mild to moderate cases, they are treated as outpatients. But for critical ones, we admit them (personal communication, September 18, 2014).

Research participant EK-PD10 responded that most of his patients who returned were due to follow-up treatment. This participants also mentioned that there were also cases of non-compliance with medication dosage or when patients have lost their prescription papers. Participant GH-PD2 stated that:

> Most of the time, it is non-compliance with dosages. Some patients might not use the medication the way I prescribed it. Other patients with financial constraint may not get the drug, and they wouldn't tell you that they did not get the drug. Some of them would say that they have used one out of three tablets that I prescribed, and would come back with the same complaints like their previous visit. Other reason for coming back could be due to an infection or resistant to a particular drug. (personal communication, September 24, 2014)

In Table 5, I present a summary of why patients return for the same treatment.

Table 5

Reasons for Repeated Visits

Responses from participants	Frequency as stated by participants from EKSUTH	Frequency as stated by participants from GHI
Follow-up treatment	8	9
Loss of prescription	4	2
Non-compliance with medication dosage	10	1
Resistance to medication	1	1

Ease of Use of EMR and PBMR

Eleven of the participants at EKSUTH have not used EMR before. The one with EMR experience stated that it was in a private clinic. Participant EK-PD8, who had experience with EMR stated that, "We do not have EMR here. But with my experience in a private clinic, I found using [PBMR] to be easier" (personal communication, September 22, 2014).

Participant GH-PD4 at GHI stated that:

> Like I spoke earlier, things would have been easier if most information about the patients is already on the computer. So, it is not as easy as [PBMR]. We do double work of documenting on papers, and entering the same information into the computer. (personal communication, September 16, 2014)

A summary of their responses are as indicated in Table 6.

Table 6

Ease of use of EMR and PBMR

Responses from participants	Frequency as stated by participants from EKSUTH	Frequency as stated by participants from GHI
EMR is easier	1	4
I have not used it enough to see any difference	-	2
No experience with EMR, and as such, I cannot make an comparison	11	-
I find it easier to use PBMR	-	5
I need more training on EMR before I can make any comparison	-	2

Increasing Usage of EMR

There was only one doctor (EK-PD8) at EKSUTH, who claimed to have used EMR at another private hospital. However, GHI doctors have all used EMR. Participant EK-PD8 stated that, "With the little experience that I have, I think doctors need more training on how to use EMR" (personal communication, September 22, 2014).

Participant GH-PD1 responded to how the usage of EMR can be increased thus:

> Well, for me, it is about having software that is user-friendly. I want something that looks like writing on a notepad. I would like it to look like I am writing on paper, so that the information can go into the system as if it has been [entered] directly into the computer. I do write freely as it comes to my mind. I write my questions freely, and it if they are stored automatically into the computer, it would

be ok with me. User-friendliness of the software could increase the usage of EMR. (personal communication, September 15, 2014)

GH-PD8 suggested that training of doctors and more training in the use of EMR could increase its usage (personal communication, September 24, 2014). Table 7 is a summary of responses from participants on how EMR usage can be increased.

Table 7

Increasing the Usage of EMR

Responses from participants	Frequency as stated by participants from EKSUTH	Frequency as stated by participants from GHI
Deploying EMR in all government hospitals will increase its usage	4	2
EMR should be user-friendly		2
I do not have any experience	11	-
Training doctors would increase its usage	1	10
There is a need for an uninterrupted power supply	-	2

Attitude of Doctors at EKSUTH and GHI to EMR Implementation

Most of the doctors who participated in this study at EKSUTH responded that they would like to see EMR deployed in their hospital and any other government hospitals in Nigeria.

Participant EK-PD5 stated the following:

> One of my colleagues, who has used EMR before stated that it would make things better for patients. For example, if they lost my prescriptions, it is already in the system, so that the patient does not have to come back for it. Besides, the drug information will be at the pharmacy before the patients get there, and this could make things faster, especially for patients. (personal communication, September, 19, 2014)

GH-PD1 opined thus:

> Because EMR was time consuming, many of my colleagues are resistant to the technology. Some of them could not type, and as such, they have issues with using it. They find it funny that we have to write on papers and then type it back into the computer. Some were not interested in it. We were forced to use eHealth. But with time some of us got to like it. What I found over time is that, the more you use it, the faster you become. To be sincere at this time, I still find PBMR to be faster to use. (personal communication, September 15, 2014)

A summary of their responses are as shown in Table 8

Table 8

Attitude of Doctors at EKSUTH and GHI to EMR Implementation

Responses from participants	Frequency as stated by participants from EKSUTH	Frequency as stated by participants from GHI
EMR is time-consuming	1	1
EMR should be deployed across all hospitals in Nigeria	7	10
I do not know because I never asked them	2	-
I still find PBMR to be faster than EMR	-	1
Positively disposed to implementing EMR	9	7
We need more training on EMR	6	7

Impact of EMR or PBMR on Work-flow and Productivity

Most of the participants at EKSUTH responded negatively to the effect of PBMR on their daily workflow. Participant EK-PD2 stated the following:

> Well, with using [PBMR], I generally see about ten patients in a day, and by the end of the day, I am a bit tired. If it has been an EMR, I think I would have seen at least 15 patients with little or no stress, and yet still have more time to counsel my patients. At least, I would have been able to spend more time with them. (personal communication, September 18, 2014)

Participant EK-PD4 had this to say on the use of PBMR:

Paper-based here slows the pace of my work. When patients come to the hospital, they have to go and get their cards from medical records department. For example, if a patient leaves out-patient department, for say, ophthalmology department, and when he/she came back, his/her case notes could still remain in that department [ophthalmology], and eventually, the case notes could be lost. Thereafter, there will be duplication of records, which could lead to some form of disjointed treatment, and this has impacted my daily workflow and productivity. (personal communication, September 18, 2014)

Participant GH-PD1 stated that:

Initially, there were problems with our EMR system. But there was a stakeholder meeting where everybody told the hospital administration about the difficulty and the challenges that we were facing. Our IT engineers were also around. So during that meeting, when we tabled down our problems, they came back to do more work on the software to make it more friendly and make it easier. When you worked on a patient that you have earlier referred to another medical clinic, you can see the patient's information or records that where entered at that department. In the past, when you entered some information into the system, other departments that you referred the patients to would not see that information. They (IT) worked on it, and eventually other departments can see the records of patients that you sent to them on our EMR. In spite of the fact that the technology has made things a bit easier, it has also has reduced the number of patients that I see

> because I still need more training. The system has affected my productivity in comparison with paper. (personal communication, September 15, 2014)

Table 9 is a summary of responses on the effects of EMR or PBMR on work-flow and productivity.

Table 9

Impact of EMR or PBMR on Work-Flow and Productivity

Responses from participants	Frequency as stated by participants	Frequency as stated by participants
EMR has negatively affected my daily workflow	-	9
EMR has positively affected my daily workflow	-	2
Neither EMR nor PBMR has affected my daily work-flow	2	1
PBMR has negatively affected my daily workflow	10	-
PBMR has positively affected my daily workflow	-	1
I still need more training on EMR	-	1

Transferring Patients' Data Between Departments

All doctor participants at EKSUTH complained about missing case notes when patients carried their records between departments. Participant EK-PD4 stated that:

> When patients lost their case notes, valuable information is gone. For example, if my recommendation will depend on records from another department, and the information is not available, I would not be able to do my work, and the patient may have to start all over again for that particular visit. This can be frustrating for patients and doctors (personal communication, September 18, 2014).

Participant GH-PD5 stated that "transferring of information through EMR has improved to some degree. But there is a lapse because some departments with EMR are not using them" (personal communication, September, 17, 2014). Participant GH-PD1 stated this:

> You know like I said, this hospital was one of the pioneers to ask for EMR mentor. Not all the departments have been linked, even up till today. However, most have been linked. Some departments like the one that takes care of HIV, physiotherapy, and dental are not linked, and this has affected transferring data to the aforementioned departments. (personal communication, September 15, 2014)

Table 10 is a summary of participants' responses.

Table 10

Transferring Patients Data Between Departments

Responses from EKSU participants	Frequency as stated by participants	Frequency as stated by participants
EMR allows for efficient transfer of data	1	9
EMR has not allowed for an efficient transfer of data	-	2
There are too many instances of missing case notes with PBMR	12	
There is a problem with departmental integration	-	2
There is no effect with EMR	-	1

Operational Cost

All of my respondents stated that the operational cost of the hospital is the responsibility of their respective hospitals' administration department. Participant EK-PD10 stated that, "I was not involved in any operational cost. This is the responsibility of the management" (personal communication, September 23, 2014). Participant EK-PD11 echoed EK-PD10 statement by saying that, "administration is responsible for any operational cost in our hospital" (personal communication, September 23 2014). The participant went further that the administration department of EKSUTH will be able to provide better information on that. Participants at GHI also echoed similar statement that their administrative department is responsible for any operational cost.

Table 11 provides a summary of my participants' responses.

Table 11

Operational Cost

Responses from participants	Frequency as stated by participants EKSUTH	Frequency as stated by participants GHI
Administration is responsible for any operational cost	12	12

Pharmacists' Interpretation of Prescriptions

Most participants stated that pharmacists do sometimes misinterpreted their prescriptions on papers. Participant EK-PD1 had this to say:

> Pharmacists can easily misinterpret whatever I wrote. Seeing them on screen [EMR] would have been more comfortable. Sometimes, pharmacist cannot decipher what I wrote, and they have to send it back for more clarification. (personal communication, September 18, 2014)

Participant EK-PD8 stated that, pharmacists do send back his prescription sometimes for clarification (personal communication, September 19, 2014).

GH-PD1 stated the following:

> It is true we have a seen scenario where they sent patients back because they could not read my prescriptions. But there is no problem with EMR. The only problem is when they wanted to go to the road-side pharmacy, and I had to write their prescriptions on papers. Because you have written a prescription in generic, some of them [road-side pharmacists] may not know it. But if patients had gone to our hospital's pharmacy, the pharmacists would know what it was. It is clear in

> EMR, and pharmacists in our hospital do not need to contend with my jagged handwriting. (personal communication, September 15, 2014)

Table 12 is a summary of participants' responses.

Table 12

Pharmacists Interpretation of Prescriptions

Responses from participants	Frequency as stated by participants from EKSUTH	Frequency as stated by participants from GHI
EMR has not improved interpretation of my prescription	-	1
EMR has positively improved interpretation of my prescription	1	11
Misinterpretation of my prescription occurred some of the time	12	-
Pharmacists sent back some of my the prescriptions that I wrote on papers	12	2
My prescriptions are sent back only when they are sent to road-side pharmacy or outside of the hospital pharmacy, when the medication is not available here.	1	2

Privacy Concerns on Exchanging Data

Participants were asked to express their concerns over the privacy of patients when data were exchanged between departments with EMR or PBMR. Participant EK-PD6 expressed himself thus:

> I am concerned about privacy with [PBMR] because any of the staff in medical records can read information about my patients. From what I leant, with EMR you can go in with your password and medical records will not be able to see that information, if it is not meant for them. (personal communication, September 19, 2014)

Participant GH-PD1 had this to say:

> No, I am not concerned about the privacy of my patients when I'm using EMR because the way the software was designed. I have my password. The only way to get into the system is if you get your password. If you are using my computer and you log in with my password, that is the only way, that you can see my patients' information. My computer is protected with a password, and no one can see my patients' information unless they know my password. So, I am not concerned about privacy, since I feel that the information is well protected. It is private enough. The paper is even less private than EMR. Anybody can read patients' records on [PBMR]. Our IT department gave us our passwords and we can change them at any time if there is any breach of security. On EMR, once I logged out, nobody can log in to my system. (personal communication, September 15, 2014)

Table 13 is a summary participants responses to privacy of information on exchanging data with EMR or PBMR.

Table 13

Privacy Concerns on Exchanging Data

Responses from participants	Frequency as stated by participants by EKSU	Frequency as stated by participants by GHI
EMR can protect patients' privacy than PBMR	-	12
EMR could expose patients' information	2	-
I am concerned about my patients' privacy with the use of PBMR	3	-
I am not concerned about my patients' privacy with the use of PBMR	6	-
I do not know anything about EMR because I have not used the software before	2	-
I am not concerned about my patients' privacy on EMR		1

Documenting Treatment Procedure

Participants were asked to describe how EMR or PBMR has been helpful in documenting their treatment procedure. Participant EK-PD4 responded as follows:

> Well, like I said, I may keep on repeating the same thing on [PBMR]. Its use has affected me negatively. When you are treating a patient, and you are documenting

> your work, and when the patients came back, only to discover that you could not find their case notes. When you want to work on a patient, you would need a lot of detailed information, and when you go through their records, and you could not find the information that you need, it can make consultation to be very difficult for patients and doctors. You are supposed to start where you left off. Now you have to begin with some leading questions again! Then, you won't know, whether there is a change in drug or treatment. Patients have not been happy because of this. (personal communication, September 18, 2014)

Participant EK-PD10 stated that the use of PBMR has not affected her documentation of treatment procedure (personal communication, September 23, 2014). However the participant stated that when previous case notes of treatment that she could depend on were missing, it has been difficult to document some treatment procedures. Participant GH-PD1 stated the following:

> That was another problem. In using EMR, there are some things you try to skip. But when you want to write manually, especially when you did some surgical procedure, you have enough room and space to write to express yourself. With EMR, you type, you get tired, and you start looking to cut corners. Do you understand? Because you are typing, it can be tiring. I had problems with EMR, but I am ok. (personal communication, September 15, 2014)

GH-PD4 stated the following:

> The use of EMR is better for documenting my procedure in that, the next time the patient that I have seen returned, I can see his or her information. Besides,

previous records of patients from another doctor or departments are now available, and as such, it makes my documentation easier than when we were using [PBMR]. (personal communication, September 16, 2014)

A Summary of responses from my participants is as indicated in Table 14.

Table 14

Documenting Treatment Procedure

Responses from participants	Frequency as stated by participants from EKSUTH	Frequency as stated by participants by GHI
EMR has positively affected documentation of treatment procedure	-	9
EMR has negatively affected documentation of treatment procedure	-	3
Neither EMR nor PBMR has affected documentation of treatment procedure	1	-
PBMR has negatively affected documentation of treatment procedure	10	-
PBMR has not affected documentation of treatment procedure	1	-
The incidence of constant power failure has interrupted documentation of treatment procedure on EMR	-	2

Unintended Consequences of EMR Implementation

Participants were asked to provide some instances of unintended consequences of EMR implementation. Participant EK-PD2 stated that "I will still say that regardless of the use of EMR, doctors should still have some paperwork to use in case of damage, so that, when the system crashes we would not loose information" (personal communication, September 18 2014)

GH-PD4 had this to say:

> During the time of treatment and if the system crashes, I could lose all the information that I have already written about my patients. We found there were some problems with the technology that we were using, and the government wanted to introduce a new type of software that will be user-friendly. I believe that the new one will be an improvement on what we were given. It should decrease the waiting time for our patients who have been in the hospital around 6:00 AM in the morning. It will improve the accuracy of our diagnosis. It will improve the rate at which patients' data are retrieved. It will decrease the waiting time in various departments that they have been to. It will make the government hospitals more patient-friendly. (personal communication, September 16, 2014)

GH-PD9 responded thus:

> We do not have constant power supply. One of the challenges or problems that we have in Nigeria is maintenance. For instance, when my PC broke down, none of the IT personnel has come to repair it. This system is not working properly. We still need more training. The health facility should be ready to give us adequate

> training. Even when I sent information via EMR to the lab, they stated that they have not seen it. I think that our system is not well-integrated. (personal communication, September 25, 2014)

Table 15 is a summary of participants' responses.

Table 15

Unintended Consequences of EMR Implementation

Responses from participants	Frequency as stated by participants from EKSUTHTH	Frequency as stated by participants from GHI
EMR can break down if the device is not well maintained, and this can lead to a decrease in productivity	5	9
Wrong data in EMR can lead to wrong diagnosis	4	2
Patients' privacy could be compromised	1	-
Patients do not trust EMR, leading to a breach of trust between patients and doctors	-	1
Programming problems can lead to wrong information	1	-
Productivity can down if system crashes	1	3

Meeting the Needs of Doctors With EMR and PBMR

Participants were asked to compare the use of EMR and PBMR in getting patients information they need for treatment. Participant EK-PD1 stated that "[PBMR] has met my needs for new patients. However, for those cards that are lost, it has not met my needs because pertinent information that I could use to make decisions correctly has been lost" (personal communication, September 18, 2014).

Participant EK-PD4 stated that "[PBMR] provides enough information that met my needs, if all the documents are intact. But then, when any of those documents is lost, it has not met my needs" (personal communication, September 19, 2014).

GH-PD1 offered the following:

> It is not any easier, really. For me personally, I like EMR. But when you put in the logistic in this part of town, especially NEPA [National Electric Power Authority], which has not provided constant electricity, things have not been easy. It can be tiring when you are writing and lights are going on and off intermittently. Whereas, with paper, it is not a problem. I know EMR is a good way. It will benefit all if power supply is stable. (personal communication, September 15, 2014)

Participant EK-PD2 stated the following:

> Paper-based has not been helpful, especially for patients who have been visiting for a long time, and their cards or case notes have been lost. With new patients, I do not have any problem because their information, which has been written by the

> medical records department is readily available. (personal communication, September 18, 2014)
>
> Participants EK-PD8 had this to say on EMR:
>
> With my little experience in using EMR, I can easily get the information that I needed from the system. However, with [PBMR], it can be difficult especially if case notes are missing. Besides, before you can see your next patient, you would have to wait until the case notes or new information about the patient gets to you. (personal communication, September 22, 2014)

GH-PD10 stated that, "I can get the information that I needed on EMR on time than I would on [PBMR]. All that I needed to do to get patients information into EMR is to enter his/her ID or names" (personal communication, September 26, 2014).

GH-PD8 stated that EMR has met their needs in that searching for patients' information is much easier than PBMR. Table 16 provides a summary of my participants' responses.

Table 16

Meeting the Needs of Patients With EMR or PBMR

Responses from participants	Frequency as stated by participants from EKSUTH	Frequency as stated by participants from GHI
Information in PBMR has not met my needs	11	-
Information in PBMR has met my needs	6	-
Information provided by EMR has not met my needs	-	5
Information provided by EMR has met my needs	-	7
There are too many missing case notes with PBMR	10	-
Neither EMR nor PBMR has provided information that met my needs	-	1
Incessant power failure has negatively affected my need on EMR	-	2
I can get timely information from EMR than PBMR	1	12
I can get timely information from PBMR	6	-
I do not get timely information from PBMR	6	-
Missing case notes affects timely information with the use of PBMR	11	-

Comparison of EMR With PBMR on Getting Timely Information

Participant EK-PD8 stated that he preferred PBMR to using EMR. This participant had this to say:

> I find EMR to be difficult to use because I do not use it all the time. My experience is from a different hospital. I'm used to [PBMR] and it is much easier for me to use it than EMR. If we had EMR here, and if I had used it on a daily basis, I think I would be able compare the technology with our traditional approach. (personal communication, September 19, 2014)

GH-PD5 stated that "EMR is not easy to use at this time because I am still learning how to use it. However, it is easier to retrieve information that are already in EMR, if you have to compare it with [PBMR]" (personal communication, September 17, 2014)

Table 17

Comparison of EMR With PBMR on Getting Timely Information

Responses from participants	Frequency as stated by participants from EKSUTH	Frequency as stated by participants from GHI
EMR is difficult to use	1	2
EMR is easier to use in getting timely information	-	5
We need more training on EMR	-	1
No experience, and I cannot make any comparison	11	-
PBMR is easier to use than EMR	2	6

Getting Up-To-Date Information

Participants were asked if EMR or PBMR has made it easier for them to get up-to-date information about their patients. Participants EK-PD8 stated that:

> Paper-based [medical records] information or EMR can provide up-to-date information. However, things are easier with EMR because you can go directly to the last information about the patients. If documents are not arranged properly in [PBMR], it can be difficult to find up-to-date information. (personal communication, September, 19, 2014)

Participants EK-PD12 had this to say:

> Like I had repeated earlier to you, we have too many cases of missing case notes,

> and as such, some valuable information are lost in the process. So, the use of [PBMR] has not provided me with up-to-date information about my patients. (personal communication, September 24, 2014)

Participant GH-PD1 had the following to say:

> EMR has adversely affected us. We are trying to see if everybody could use EMR. Our work was slower with the use of EMR. Average number of minutes that we spent using EMR was more than we were with [PBMR]. Maybe some people should be using EMR while some should be using paper. The aim of using EMR was to reduce patients waiting time, but it seems not to be working as expected. Patients want to leave on time and would not wish to stay the whole day for a simple treatment. (personal communication, September 15, 2014)

Participant GH-PD7 that, "I can get up-to-date information on EMR faster because of the search capability of the system. In [PBMR], I have to leaf through sheets of papers before I can get what I need" (personal communication, September 24, 2014).

Table 18

Getting Up-To-Date Information

Responses from participants	Frequency as stated by participants from EKSUTH	Frequency as stated by participants from GHI
I can get up-to-date information from PBMR	5	-
I can get up-to-date information from EMR	1	9
I cannot get timely information from EMR	-	3
Missing case notes in PBMR has affected getting up-to-date information	12	-

Impact of EMR or PBMR on Performance

Participants were asked to describe how the use of EMR or PBMR has affected the performance of their departments. Participant EK-PD9 stated the following:

> The performances of my department were affected whenever case notes were missing with the use of [PBRM]. We would need to repeat the same treatment that we rendered or have to guess the next treatment. So, we spend more time, treating the same patients. We do not know what the last doctor has done when you cannot follow the flow of treatment, and this can affect the quality of care. It also takes a lot of time for medical records department to open another case for this patient. This delay in operation has taken a chunk of our time. Then, you end up spending less time with the patient, and this can affect the quality of our work.

(personal communication, September 22, 2014)

Participant EK-PD12 stated that "It has affected our productivity, especially, when we had to spend more time looking for missing case notes, instead of attending to our patients. This is really frustrating" (personal communication, September 23, 2014).

Participants GH-PD8 stated that EMR has contributed to the performance of their department by saying: "Our performance has improved. We can get to patient's information faster. We can diagnose cases faster than in the past. Moreover, we have been able to see more patients per day" (personal communication, September 25, 2014).

All doctor participants at GHI stated that their productivity had been negatively affected whenever there are power outages. Participant GH-PD9 reported the following:

> EMR has been down quite a few times because of non-availability of power supply. This downtime has affected our productivity. We ended up going back to using papers to enter our information. And after that, we would go back and re-enter that information when lights [power supply] came back. (personal communication, September 25, 2014)

Table 19

Impact of EMR or PBMR on Performance

Responses from participants	Frequency as stated by participants from EKSUTH	Frequency as stated by participants from GHI
EMR has improved the performance of my department	-	6
EMR has negatively improve the performance of my department	-	6
Neither EMR nor PBMR has affected the performance of my department	1	-
PBMR has negatively affected the performance of my department	11	-
Training in the use of EMR is needed to increase performance	-	1
EMR downtime has negatively affected our department	-	12

Impact of EMR or PBMR on Quality of Care

Participant EK-PD8 stated that although he has little experience in using EMR at another hospital, and as such, he could not make any judgment on whether EMR has improved the quality of healthcare in Nigeria (personal communication, September 19, 2014). Participant GH-PD4 had this to say:

> Well, when we talk about quality of healthcare, it is not just in terms of having EMR available, it also includes the experience in the training of the physician that is seeing the patient. Since the deployment of eHealth, I would say that the quality

> of healthcare has been improved to some extent with EMR. And in my department, we can now make a comparison, and we can assess the mistakes, and we can formulate policy. Over the week, we can see that whether we are seeing a patient over a particular ailment and would notice whether a mistake has been made by other physicians in the cause of treatment of the patient. It has helped us in training our doctors and has helped us in formulating our protocol in patients' management. We can now investigate or refer patients to a senior colleague. (personal communication, September 16, 2014)

Table 20 is a summary of the responses of participants.

Table 20

Impact of EMR or PBMR on Quality of Care

Responses from participants	Frequency as stated by participants from EKSUTH	Frequency as stated by participants from GHI
EMR has improved the quality of healthcare	-	7
EMR has not improved the quality of healthcare	-	5
PBMR has not improved the quality of healthcare	12	-

Impact of EMR or PBMR on Decision Making

Participants were asked if the use of EMR or PBMR has affected their therapeutic decision in the cause of treating any patients. Participant EK-PD3 had this to say on PBMR:

> I don't think [PBMR] has affected my therapeutic decision unless I need to get the past medical records of some patients, and there are some missing documents. For example, if patients cannot remember the name of the drugs that were previously prescribed, it can make things difficult if the records are not available. So, on a follow-up treatment, yes, maybe it would affect my decision. (personal communication, September 18, 2014)

Participant GH-PD10 stated that "The use of EMR or [PBMR] has not affected my therapeutic decision. Recall that I usually duplicate my information on EMR and [PBMR]" (personal communication, September 26, 2014).

GH-PD1 stated that her therapeutic decision has not been influenced by either EMR or PBMR. A summary of participants' responses is as indicated below in Table 21

Table 21

Impact of EMR or PBMR on Decision Making

Responses from participants	Frequency as stated by participants from EKSUTH	Frequency as stated by participants from GHI
EMR has not supported my therapeutic decision	-	1
EMR has supported my therapeutic decision	-	1
Neither EMR nor PBMR has supported my therapeutic decision	5	10
PBMR has not supported my therapeutic decision	8	-
PBMR has supported my therapeutic decision	1	-

Impact of EMR or PBMR on Healthcare Issues

Participants were asked if the use of EMR or PBMR has influenced their consideration for all aspect of healthcare issues. Participant EK-PD6 reported the following on PBMR:

> The use of [PBMR] is cumbersome, especially, if the patients have been in the hospital for a while. On patients with few cases, it could be easier. But in all, I would say that paper-based medical record has not been helpful in considering all aspects of patient's condition. (personal communication, September 19, 2014)

Participant EK-PD9 stated that “Consideration for all cases is fine if all records or

information are there. But the problem is that of missing case notes, and this has made it difficult to consider all aspects of a medical condition" (personal communication, September 22, 2014).

GH-PD1 opined thus:

> It is the same thing. In medicine, there is a particular format to get information from patients with respect to their complaints, and this software was designed that way. With this EMR, we can get all the vital statistics and all other information about our patients. You log in with the patient's code, and you will see the patients' information. This information is recorded in the same format that we have been taught in med [medical] school. It is the same thing. Whether I am writing or using EMR, I still follow the same way. At the end of the day, you still get the same result because there is nothing you have missed. Therefore, neither EMR nor [PBMR] has influenced my consideration for all aspects of a medical condition. (personal communication, September 15, 2014)

Table 22 summarizes responses from participants

Table 22

Impact of EMR or PBMR on Healthcare Issues

Responses from participants	Frequency as stated by participants from EKSUTH	Frequency as stated by participants from GHI
EMR has been helpful	-	9
EMR has not been helpful	-	1
I need more training to be able to assess EMR better	-	2
PBMR has not been helpful	12	-
There is no difference in EMR or PBMR	1	1

Satisfaction With EKSUTH or GHI facilities

Most of the participants (physicians) were not satisfied with the facility of their respective medical center. However, majority of them empathized with the administration of their hospitals, considering what they called, meagre government's allocations to their respective hospitals. Participant EK-PD1 responded thus:

> I am not quite satisfied. Though human wants are unlimited, we are coping with what we have here. We have not been given risk allowance. It is a significant problem. No risk allowance for doctors, nurses, management board and other clinicians. They [administration] need to be more conscious of the patients that I have, and if I contracted anything, I am on my own. There is no health insurance for doctors, nurses, and health workers. If a patient needs to go to the theatre

immediately, I have been doing it with less equipment. But we just thank God that we have seen good results. If they help equip the theatre, things would be better. There is no constant power supply. So, we make use of our lamp or [flash] light sometimes for non-critical surgery. Can you imagine how comfortable it would have been if we have power and water supplies? Our hand washing base is outside. (personal communication, September 18, 2014)

Another participant EK-PD7 stated the following:

Well, I am not satisfied, giving the status of this hospital, which is a teaching hospital. There are certain things that I expected from a teaching hospital. They do not measure up to standard. There is a complaint of lack of fund from the government. What is worth doing at all is worth doing well. If you are ready to establish a teaching hospital, you should be willing to foot the bill. The facilities are grossly inadequate. I'm happy that I have a place to work though. They gave us this office, after a lot of struggles. I am lucky to have an office. In the past, there was a common room for doctors. The current administration is taking effort to ensure that all doctors have their private room. The past administration was not as great. We need more staff. It is grossly inadequate. This is why I see 15 to 20 patients in a day. I cover emergency and OD [outpatient department] on a daily basis. Some junior residents when they see cases that they are not familiar with, they will call me. It is quite stressful. The nurses also complain that they don't have enough staff. What we have are not optimal. Though we have a good theatre, we need some equipment that are very simple where we can easily measure

> patients' blood count, rather than sending it to the labs. We do need a side lab. The laboratory personnel do not provide quality results. They need more qualified staff. In medical records, there are too many instances of missing records. If I wanted to see what I did for a patient, I discovered that they are no longer there. (personal communication, September 19, 2014)

On the other hand, Participant EK-PD8 was sympathetic to the hospital. This participant had this to say:

> Considering the revenue of this state, which is land-locked, and seeing what they are doing with [allocation from our government], I am satisfied with the overall facilities of the hospital. Of course, it could be improved. What we need to do as a doctor is to be close to our patients, and when we are close to our patients, it will help in where the facility is lacking. We will learn more from the patients. We need to spend more time with patients in spite of the facility. In spite of the meagre revenue, I think they are trying. The facilities are not as much as what we would have wanted. But with what we have vis-a-vis the revenue of the state, I am satisfied. You know things in life are relative. (personal communication, September 19, 2014)

Participant GH-PD1 stated the following:

> I am not satisfied with the overall facility. For instance, the EMR would have benefitted me and the patients if it were properly introduced to me. Things don't work the way I expect it to be. Our workload is much, because there are fewer doctors to do the job. For me, I see as much as 35 on a good day in 8 hours from

8:00 AM to 4:00 PM. You do not even go home on the day that you are on calls. You go to your call duty and continue till the next morning. In spite of this, the administration still expects you to come back the next day. (personal communication, September 15, 2014)

Participant GH-PD4 responded thus:

We are operating in a resource-limited country, and the present government has invested a lot in the healthcare system of Lagos State. The hospital today is much better than when I started working here. However, there is still a lot of room for improvement. When we talk about facility, for example, in family medicine, there is still quite a lot of equipment that we do not have. For instance, if a patient comes with a chronic disease, we would like to be able to do the right test with the right equipment. We like to have CG [cardiogram] for chest pain. We have a new CG, but we have to send our patients to get to the other departments to have it done. And sometimes we have to wait for a few days before we can attend to the patients because the result did not come on time. We would like to have the CG done right away. We are working on it though. We have been promised some things. I would not say that I am satisfied with what I have. Even in the Western world like the USA, nobody is ever satisfied. I believe we are getting there gradually, though at a snail's pace. But we are getting there. The problem is finance. They are so many competing forces from various departments and our civil service bureaucracy. There is room for improvement. (personal communication, September 16, 2014)

Participant GH-PD-6 had this to say:

I am satisfied. The issue is that, no matter what, things can always be improved. The hospital used to be awful. Things have tremendously improved. I have to be frank on that. There is still a lot to be done. We are not yet there, but it has tremendously improved. (personal communication, September 17, 2014)

Participant GH-PD10 stated the following:

Well, I will say, when it comes to comparing this overall facility with what we can get in UK, USA or Switzerland, I would say, we have a lot of room for improvement. That means I am not satisfied. However, looking back 5 or 10 years ago, it has improved tremendously. The change has been astronomical. All I would say is, we have a lot of room for improvement, and we can do it if the will is there. So far, I like the way things are going because we are getting better. (personal communication, September 26, 2014)

Responses from my participants are summarized below

Table 23

Satisfaction With EKSUTH or GHI Facilities

Responses from participants	Frequency as stated by participants from EKSUTH	Frequency as stated by participants from GHI
I am not satisfied	11	11
I am satisfied	1	1
The government is trying	1	2

The following categories will show all responses from patients at EKSUTH and GHI, based upon the interview schedule for patients in Appendix A.

Insurance Coverage

GH-PP8 stated that "I do not pay. I do not have insurance. It is government's hospital. Maybe because the government doesn't want us to pay" (personal communication, September 22, 2014). Table 24 is a summary of responses from participants.

Table 24

Insurance Coverage

Responses from participants	Frequency as stated by participants from EKSUTH	Frequency as stated by participants from GHI
I do have government insurance	-	1
I do have private insurance	2	3
I do not have any insurance	10	7
I do not need one here because it is a government hospital	-	2

Level of Caring

Participants were asked to describe the level of caring by their doctors. EK-PP10 stated that "Well, they are trying. But there is still room for improvement. I want more caring from them. They rush me out quickly" (personal communication, September 24, 2014).

GH-PP1 stated the following:

> They have improved. In 2010, the doctors and nurses them, they were old. If nurses called you and you did not answer, they will just put your card aside, and they will not call you. But as I came this morning, they have undoubtedly improved. The nurses are not old women. They are young, and they have improved in many ways. (personal communication, September 15, 2014)

Table 25 is a summary of responses from participants.

Table 25

Level of Caring

Responses from participants	Frequency as stated by participants from EKSUTH	Frequency as stated by participants from GHI
My doctor cares about me	9	10
My doctor doesn't care because they rush me out too quickly	-	1
Their level of caring is ok	3	3

Satisfaction With Treatment

Participants were asked if they were satisfied with the treatment that they have received during their present visit. GH-PP3 stated that "I am only scared whenever they go on strike. But now, they are doing a good job. I am satisfied with my treatment" (personal communication, September 16, 2014). Participant GH-PP8 stated that she is not satisfied because she had to wait for too long before she was seen by a doctor. Moreover, she reported that she was rushed out quickly before she had enough time to explain her

problems. Table 26 is a summary of responses from participants on satisfaction with treatment.

Table 26

Satisfaction With Treatment

Responses from participants	Frequency as stated by participants from EKSUTH	Frequency as stated by participants from GHI
I am not satisfied with my treatment	-	3
I am satisfied with my treatment	12	9
I can see some improvement than before	1	-

Time Spent With Doctors

Participants were asked to describe their expectations of treatment if their doctors had spent more time with them. Participant EK-PP4 stated that "Well, it would be selfish to devote more time with me because of other patients. I believe that the treatment will be the same. It won't make any difference" (personal communication, September 18, 2014).

EK-PP7 went thus: "My expectation is to know the actual treatment. I think they would do a better job if they spent more time with me. I feel like I would get better care with more time with my doctor" (personal communication, September 19, 2014).

GH-PP1 stated that "By spending more time with me, they would tell me more about my treatment, rather than saying that I should come back. I expect better treatment, if the doctor had spent more time with me" (personal communication, September 15,

2014). GH-PP9 opined thus:

> I feel that I would get better care if my doctor had spent more time with me. If they take the time on patient, the patient will be able to tell them more. But I cannot blame the doctors because they do not have enough personnel. Doctors are humans, and if there are too many patients, and they have not eaten since morning, nobody knows what can happen. (personal communication, September 17, 2014)

Table 27 is a summary of responses from participants.

Table 27

Time Spent With Doctors

Responses from participants	Frequency as stated by participants from EKSUTH	Frequency as stated by participants from GHI
I think I would get better treatment	8	11
It would not make any difference	4	1
The time does not matter as long as the doctor prescribed the right medication	1	-

Skills Level of Doctors

Participants were asked to describe their satisfaction with the skill levels of their doctors. EK-PP12 stated that “It is ok. They are now better than the ones in the past. It

looks like they have acquired some skills" (personal communication, September 24, 2014). Participant GH-PP1 stated the following:

> Um, the time my brother was sick, and my mother was also here, I had to take him from school. For some reason, maybe the doctor was in a bad mood. He was hostile to me. At that time, I doubted his skills level. For others, they are ok. (personal communication, September 15, 2014)

GH-PP2 stated the following:

> Well, the older doctors are more attentive than the younger ones. And because of their experience, they have a greater level of care. The younger doctors are always in a hurry to get you out. I think the older ones have better skills than the younger ones. (personal communication, September 15, 2014)

Table 28 is a summary of responses from participants.

Table 28

Skills Level of Doctors

Responses from participants	Frequency as stated by participants from EKSUTH	Frequency as stated by participants from GHI
I am not satisfied with my doctor's skill level	-	3
I am satisfied with my doctor's skill level	12	8
I think older doctors have better skills than the younger ones	-	1

Choice of Hospitals

Responses from patients regarding their selection of hospitals for treatment were mostly about nearness to their place of residence or about the cost of treatment. Table 29 provides a summary of patients' responses.

Table 29

Choice of Hospitals

Responses from participants	Frequency as stated by participants from EKSUTH	Frequency as stated by participants from GHI
I do not have a choice	5	3
I think I will get better treatment	5	5
It is cheaper than private hospitals	5	3
It is nearer to my home	7	5

Availability of Equipment for Treatment

Participant EK-PP1 commented on EKSUTH that, "They still need more equipment. They have not measured up to the standard of other teaching hospitals in the country" (personal communication, September 18, 2014).

GH-PP2 had this to say:

Well, the equipment is ok. But I have been here for some time, and they said that their equipment was not working, and they asked me to come back. They need to make sure that their equipment is always ok. They should not be asking me to

come back again. (personal communication, September 15, 2014)

Table 30 is a summary of responses from participants.

Table 30

Availability of Equipment for Treatment

Responses from participants	Frequency as stated by participants from EKSUTH	Frequency as stated by participants from GHI
I don't know	1	-
Not enough equipment for treatment	-	1
The equipment is adequate	-	2
Their equipment is ok	4	-
They need more equipment	7	9

Environmental Satisfaction on Cleanliness

Patients were asked to describe their satisfaction with their respective hospitals' environment on cleanliness. GH-PP3 stated that "Yes, I am really impressed. In those days, I have to close my nose because [the environment] was smelling. So, this place is clean, and I am very satisfied. A summary of their responses is as indicated in Table 31 below.

Table 31

Environmental Satisfaction on Cleanliness

Responses from participants	Frequency as stated by participants from EKSUTH	Frequency as stated by participants from GHI
The hospital is clean	11	11
The hospital is clean considering my last visit	-	2
The hospital is not clean enough. They still have to improve more	1	-

Recommending Physicians

EK-PP1 stated that "I know good experienced doctors that I can ask people to go and meet. I would likely recommend my doctor to other patients" (personal communication, September 18, 2014). GH-PP3 had this to say: "This is not about me. The best private hospital cannot meet up to the standard of public hospital. I believe doctors here get better training. I can recommend any doctor here to other patients" (personal communication, September 16, 2014). Responses from my participants are as shown in Table 32.

Table 32.

Recommending Physicians

Responses from participants	Frequency as stated by participants from EKSUTH	Frequency as stated by participants from GHI
I will not recommend my doctor	-	1
I will recommend my doctor	12	11
They are better than before	-	1

Keeping Patients Informed About Their Healthcare

Patient participants were asked if their doctors have kept them informed about their healthcare. Participant GH-PP3 stated that "Um, ok. Based on my last experience my doctor was hundred percent at informing me about my ailment. Even when I was scared he was able to allay my fear. He kept me informed" (personal communication, September 16, 2014).

Participants' responses are as indicated in Table 33

Table 33

Keeping Patients Informed About Their Healthcare

Responses from participants	Frequency as stated by participants from EKSUTH	Frequency as stated by participants from GHI
I am adequately informed about my healthcare	11	12
I am not adequately informed about my healthcare	1	-
I was rushed out too quickly	1	-

Friendliness and Courtesy by Doctors

EK-PP10 stated that "Some are friendly, while quite a few are unfriendly. They would start asking you if your family had these diseases. In all, they are not as friendly as I would like them to be" (personal communication, September 24, 2014). EK-PP12 responded that "To me, now the doctors are friendly. Unlike the other days, they shouted at me, and made it difficult for me to explain what has affected me. Now, they are familiar with the patients" (personal communication, September 24, 2014). GH-PP3 had this to say:

> Um, they are very courteous, based on my experience. I don't like the nurses. Nurses are so hyper when I was sick, and the nurses do not respond as I would like them to be, but when I finally got to the doctor, they responded better than the nurses. (personal communication, September 16, 2014)

Table 34 provides a summary of responses from participants

Table 34

Friendliness and Courtesy by Doctors

Responses from participants	Frequency as stated by participants from EKSUTH	Frequency as stated by participants from GHI
Older doctors are more friendly	-	1
Some are unfriendly	2	-
Some of the nurses are not friendly	-	1
They are better than before	1	1
They are friendly	11	11

Attention to Patients by Doctors

Participant EK-PP1 stated that "Most of those things can happen to anyone. If they are in a hurry, they won't pay much attention. Sometimes they were attentive, and sometimes they were not attentive" (personal communication, September 18, 2014). GH-PP4 stated that the older doctors are more attentive than the younger ones. Table 35 provides a summary of their responses.

Table 35

Attention to Patients by Doctors

Responses from participants	Frequency as stated by participants from EKSUTH	Frequency as stated by participants from GHI
Older doctors are more attentive than the younger ones	-	1
They are attentive, but sometimes they are not attentive	2	-
They are attentive	11	11
They are not attentive	1	-

Comfort Level With Doctor's Examination

Participant GH-PP3 stated that "Um, I very comfortable with a female doctor. I am not comfortable with the male doctors then. But now, I am more exposed, and with experience, I am now comfortable with all doctors" (personal communication, September 16, 2014). Table 36 is a summary of responses from participants.

Table 36

Comfort Level With Doctor's Examination

Responses from participants	Frequency as stated by participants from EKSUTH	Frequency as stated by participants from GHI
I am comfortable with my doctor	12	10
I am not comfortable with male doctors	-	1
I am not comfortable with some doctors	-	1

Availability of Doctors

GH-PP3 stated that "They need more doctors here because the number of patients has increased a lot than what it was in the past" (personal communication, September 16, 2014). Table 37 is a summary of their responses.

Table 37

Availability of Doctors

Responses from participants	Frequency as stated by participants from EKSUTH	Frequency as stated by participants from GHI
There are enough doctors.	-	1
There are not enough doctors	5	2
They need more doctors and other clinicians	9	9

Cost of Treatment

Most participants agreed that the cost of treatment in their respective hospitals is affordable. A summary of their responses is as stated below in Table 38

Table 38

Cost of Treatment

Responses from participants	Frequency as stated by participants from EKSUTH	Frequency as stated by participants from GHI
I am not satisfied	1	-
I am satisfied	3	5
I have insurance, so I do not have to pay	-	5
The cost of treatment is ok	7	4

Effects of Previous Treatment on Current Condition

GH-PP2 stated that "Well, the last time I came, I was not ok with it. It has affected my condition. I'm here again with the same problem because the previous treatment has not been effective" (personal communication, September 15, 2014). Table 39 is a summary of responses from participants.

Table 39

Effects of Previous Treatment on Current Condition

Responses from participants	Frequency as stated by participants from EKSUTH	Frequency as stated by participants from GHI
Previous treatment by my doctor has negatively affected my condition	-	1
Previous treatment by my doctor has not affected my condition	12	11
Previous treatment by my doctor has positively affected my condition before coming here	-	1

Evaluation of EKSUTH and GHI on Noise, Temperature, and Cleanliness

Participant GH-PP2 stated that "Well, it is too noisy here. That is a major thing, but I am ok with noise, since we are in the hospital environment, where there is a lot of people. It is noisy, but that is ok" (personal communication, September 15, 2014). GH-PP3 stated the following:

> Um. Very clean. The temperature is too high though. I would like to have air condition in the hospital. It is a bit too hot. If I came here with a headache, it would be too much for me. At the reception, I tried to listen to the receptionists, and I could not concentrate. The noise is too much. (personal communication, September 16, 2014)

GH-PP8 stated that "It is too hot. We need air-conditioning here. Besides, it is too

noisy at the medical records area, because you have to shout before they can hear you" (personal communication, September 24, 2014).

Table 40

Evaluation of EKSUTH and GHI on Noise, Temperature, and Cleanliness

Responses from participants	Frequency as stated by participants from EKSUTH	Frequency as stated by participants from GHI
It is noisy	3	1
The environment is clean	1	1
The environment is ok	1	1
The temperature is too high	9	9
They need air conditioning	9	10

Expectation on Result of Treatment

Participants were asked to describe their expectation on result of the treatment that they have received on their current visit. GH-PP3 stated the following, "Well, like I said, I have faith in every doctor here. I know what they went through. I do not have any preference. I expect the result of my treatment to meet my expectation" (personal communication, September 16, 2014)

Table 41 is a summary of responses from participants.

Table 41

Expectation on Result of Treatment

Responses from participants	Frequency as stated by participants from EKSUTH	Frequency as stated by participants from GHI
I need more time with my doctor	6	2
I think they are trying in spite of their limited resources	-	-
My treatment today did not meet my expectation	2	2
My treatment today met my expectation	10	10

Patients' Observation on Benefits of EMR and PBMR

EK-PP5 stated that "I don't know of any advantage with [PBMR]. But some patients have complained that some of their documents have been lost, and they have to see their doctors for the same case again" (personal communication, September 19, 2014).

EK-PP8 stated this:

> I have not seen any EMR before. With [PBMR], the disadvantage is that, case notes are missing sometimes. Sometimes, when cards are lost, patients have to get new cards again, and their previous information is no longer available. A lot of patients were not too happy about missing case notes. (personal communication, September 19, 2014)

GH-PP10 had this to say:

With EMR, they can easily find out that I have registered before. However, the system is not well integrated. But at one time, they told me that they could not locate all of my information. So, they opened a new case files for me. But the process was very fast. (personal communication, September 26, 2014)

Table 44 is a summary of responses from participants.

Table 42

Patients' Observation on Benefits of EMR and PBMR

Responses from participants	Frequency as stated by participants from EKSUTH	Frequency as stated by participants from GHI
EMR is faster than PBMR	-	9
I do not know	-	3
I do not see any advantage	3	-
PBMR is cumbersome	1	-
There are too many missing case notes with PBMR	8	-

Experience on Hospital Work-Process

Participant EK-PP8 stated the following:

That is a difficult process, and it takes too much time. Sometimes, you have to be in the hospital as early as possible to get your card so that you can see your doctor on time. People do stay for 6 or 7 hours before leaving the hospital. In OD (Outpatient Department), people must come to the hospital as early as 6:00 AM,

> and won't leave until 3:30 or 4:00 PM, which can be due to registration, going to another department for x-ray, paying for the cost of treatment in the bank sometimes, and this has been difficult for patients, and even for the doctors, who have to wait for the patient to come around. (personal communication, September 19, 2014)

EK-PP10 had this to say:

> It took too long, because you have to pay some money somewhere else. There is a bank in the hospital that you need to pay to. They will now give you a receipt, and you then go back to where you will take treatment. It took a long time before you can even see a doctor. (personal communication, September 22, 2014)

GH-PP3 responded thus:

> Um, they still need a lot of improvement. I was confused when they gave me my card. I do not know where to go next. I am supposed to get information, but they did not provide me with enough information. I believe that a lot of improvement is needed. (personal communication, September 16, 2014)

Participant GH-PP12 stated that "the process between registration and the time that I completed my visit was not that long. It has improved over my previous visits" (personal communication, September 26, 2014). Table 45 is a summary of responses from participants.

Table 43

Experience on Hospital Work-Process

Responses from participants	Frequency as stated by participants from EKSUTH	Frequency as stated by participants from GHI
I have seen improvement with the use of EMR	-	11
More improvement is needed	-	1
The process is ok with [PBMR]	6	-
The work process is slow with [PBMR]	6	-

Suggestion for Improvement at EKSUTH and GHI

EK-PP8 stated that "They need more time with their patients so that we can have time to say our concerns. Time is wasted with trying to locate case notes, and then, we get rushed out quickly" (personal communication, September 19, 2014).

EK-PP12 stated the following:

> I think the improvement they would need is to implement EMR so that doctors can attend to us faster. With EMR, we do not have to be carrying case notes around. Looking for missing files by personnel takes away a lot of time before they can attend to patients. (personal communication, September 24, 2014)

GH-PP8 had this to say:

> I think they should provide more facilities. Sometimes you get to the pathology department, and had to wait for a long time. When you need test in the lab, they

ask you to come the next day or to go and do it somewhere else other than this hospital. I think they should improve on that. (personal communication, September 25, 2014)

GH-PP9 offered the following advice:

The only thing I can suggest for improvement is when patient comes to them for the first time, they need to be patient with the patient. Sometimes, they made mistake documenting information that is not for that patient, without asking for their names. (personal communication, September 25, 2014)

GH-PP11 had this to say:

Well, I would like to see more doctors because there are more patients now than before. Patients are waiting too long before they can see their doctors. Some people came here, and they have to go back to their business or place of work, but they stay the whole day, and won't be able to go back to their place of work on time. (persona communication, September 26, 2014)

Table 44 is a summary of responses from participants.

Table 44

Suggestion for Improvement at EKSUTH and GHI

Responses from participants	Frequency as stated by participants from EKSUTH	Frequency as stated by participants from GHI
Doctors should report for work on time	-	1
Need personal attention from the same doctor	-	1
Nurses should also care as much as doctors	-	1
The level of caring is ok	5	1
The need better infrastructure	-	-
They need more doctors and other clinicians	1	4
They need more equipment	2	2
They need to spend more time with patients	3	2
They should be friendly and show more courtesy	1	1

Overall Impression of Healthcare at EKSUTH and GHI

EK-PP8 had this to say about EKSUTH:

My impression about the hospital? It is an old hospital and has just been upgraded to a teaching hospital. This hospital does not have all the necessary equipment. It needs more staff so that it can meet the standard of other teaching hospitals in the country (personal communication, September 19, 2014).

GH-PP3 opined on GHI thus:

I came with the mindset of what I used to have before. Today, I noticed that things have changed, and I am impressed. However, it is frustrating to someone if you are asking for some assistance in medical records department, and they are doing something else without talking to you. It makes you look stupid. It is annoying, and you are talking to a person and it looks like you are not there. The glasses behind the registration area are too opaque, and it cannot transfer sound. I wish they do not have glass to separate us. (personal communication, September 15, 2014)

GH-PP4 had this to say:

In private hospital, we get 100% attention. It is because we do not have a choice that I come here because of money. Most of the time, we do not get the attention that we need as patients, especially in the medical records area. I only came here because it is affordable. (personal communication, September 15, 2014)

GH-PP4 stated the following:

We need more hands than what we have now. They are too short of personnel. We have a lot of patients, and the staff is so few. If there are more hands, all the patients' needs will be attended to, by the special grace of God. It is God that does it (healing) and not by human power. We need more hands, and that is what I can say. (personal communication, September 15, 2014)

Table 45 is a summary of responses from participants.

Table 45

Overall Impression of Healthcare at EKSUTH and GHI

Responses from participants	Frequency as stated by participants from EKSUTH	Frequency as stated by participants from GHI
I am impressed	1	3
I hate the glass separation at medical record	-	1
I prefer a private hospital, but I came here because it is affordable	-	2
I think they are ok	5	1
I will grade them as fair	1	-
Pharmacy does not have enough drugs	-	1
Some of the doctors are too mean	1	-
They are trying	2	-
They have improved	-	2
They need more doctors and other clinicians	2	4
They need more equipment	1	1
They need to install EMR for faster data retrieval	1	-

The categories that emerged from the analysis of my first research question are (a) time to complete registration, (b) procession time to replace lost card, (c) experience on time to locate patients' information before treatment, (d) impact of EMR and PBMR on

processing time to complete treatment, and (e) impact of EMR and PBMR on doctor's time with patients.

Time to Complete Registration

Participants were asked to describe their experience on time to complete registration at their respective hospitals. EK-PP10 stated that "It took a lot of time. I had to wait for a long time until I was called. It was a long process before I got someone to attend to me" (personal communication, September 24, 2014). GH-PP1 stated the following:

> Um, it wasn't very long. Let's say it was slower because medical records personnel did not answer me as I had expected. They did not have enough people to attend to me. They were not using electronic [EMR], but they were using computer. (personal communication, September 15, 2014)

GH-PP3 had this to say:

> It is been a while that I came. The last time that I came was in 2008. To me there is an improvement. It took less time than the last one. Sometimes though, I had to shout across the glass before they can attend to me at the medical records department. I can hear them across the glass. But the registration was faster than my last experience. To me, as time goes on I believe we should not have to wait for more than 20 minutes, because if I came with an emergency, it could be difficult. But for now, I think I am impressed. (personal communication, September 15, 2014)

Table 46

Time to Complete Registration

Responses from participants	Frequency as stated by participants from EKSUTH	Frequency as stated by participants from GHI
I have seen some improvement	-	1
It depends on the number of patients around	1	-
It did not take a long time	4	8
It took a long time	5	4
It took less than 30 minutes	2	-
It took more than 30 minutes	2	-

Processing Time to Replace Lost Card

Participant EK-PP8 stated the following:

Well, when I lost my card, it took a longer time to process. I was asked to state the reason why I lost my first card. After that, they issued a new card, and they warned me seriously. The hospital staff warned me that if I lose my card again, the hospital would not give me another one to replace it. (personal communication, September 19, 2014)

GH-PP1 had this to say:

I was offered a card in 2010. When I came now, I asked the receptionist if I can still use the 2010 card, and he said, no. He said I had to collect a new card since they couldn't locate my old card. I was given a form to fill. I finished the form,

and I returned it back to them. The process of replacing my card was very fast. (personal communication, September 15, 2014)

Table 47 is a summary of responses from participants.

Table 47

Processing Time to Replace Lost Card

Responses from participants	Frequency as stated by participants from EKSUTH	Frequency as stated by participants from GHI
I have never lost my cared before	9	7
I have to pay to get another one	1	-
It did not take that long	1	4
It took too long	2	1

Experience on Time to Locate Patients' Information Before Treatment

EK-PP9 had this to say:

It has given doctors and patients a lot of problems. In carrying cards or case notes from one place to another, some patients would lose their cards, and sometimes, we had to go back to medical records to get a new card. That is a lot of stress, and it could take 2 to 3 hours to locate your information before they can get any treatment. (personal communication, September 23, 2014)

Participant GH-PP2 responded that, "Well, after taking your card to medical records department, maybe 15 minutes later, the attending nurses would take your BP (blood pressure), and then you can go and see your doctor. The process didn't take that

long" (personal communication, September 15, 2014).

Table 48 is a summary of responses from participants.

Table 48

Experience on Time to Locate Patients' Information Before Treatment

Responses from participants	Frequency as stated by participants from EKSUTH	Frequency as stated by participants from GHI
It depends on the case that took me to this hospital	1	-
It did not take long to locate my information	6	9
It took about 30 to 40 minutes	2	1
It took too long to locate my information	3	1

Impact of EMR and PBMR on Processing Time to Complete Treatment

EK-PP8 had this to say on processing time to complete treatment on her second visit for the same treatment within the same month:

> In my experience, whenever I came back for the same treatment, sometimes, I may spend 1 to 1.5 hours to complete all the necessary treatment. Sometimes, I will be given a form for lab test, and with that, it could take from 2 to 3 hours if I did a test in the hospital. This process is too long for me. (personal communication, September 19, 2014)

GH-PP4 stated that "The treatment took long because it was a complicated health issue. But I was still able to see my doctor for treatment" (personal communication,

September 16, 2014). See table 49 for a summary of responses from participants on processing time to complete treatment.

Table 49

Impact of EMR or PBMR on Processing Time to Complete Treatment

Responses from participants	Frequency as stated by participants from EKSUTH	Frequency as stated by participants from GHI
I can see some improvement	2	-
I have not been with the same doctor twice within a month	6	7
It depends on the number of patients around	1	-
The process was fast	2	2
The process was not that long	2	1
The process was too long	2	2

Impact of EMR and PBMR on Doctor's Time With Patients

Participant EK-PD4 stated that he had not used EMR before. The participant also stated that PBMR has not allowed him to spend more time with his patients. Participants EK-PD4 continued thus:

Looking for records and missing case notes has affected the time that I spent with my patients. Sometimes, you want to make references to previous records of some

> patients, and you have to go through pages of paper, only to discover that some relevant documents have been missing. With EMR, those who have used it stated that you could easily get previous records of patients since they have been securely saved on computer. (personal communication, September 18, 2014)

Participants EK-PD9 stated the following:

> Patients normally came around 6:00 AM to the out-patient department, and I do not get to the hospital until about 8:30 AM. If I see them at 8:30 AM, and there are several patients who have been waiting for a long time, I had to rush through consultation quickly for each patient in order to ensure that I see all my patients before the end of the day. In other words, I spent less time with my patients in order to see other patients who have been waiting for a long time. So, I would say that [PBMR] has negatively affected the time that I spent with my patients. (personal communication, September 19, 2014)

Participant EK-PD10 stated that the time spent with patients depends on individual patient's ailment, and that PBMR has no effect on the time spent with his patients (personal communication, September 19, 2014). Participant GH-PD1 stated the following:

> EMR increases patient/doctor's time, unlike the paper. In paper, you have abbreviations that you can use to save time. For the EMR, you have to go all along, based upon the software. I have not seen any other EMR other than eHealth [the EMR software that they use at GHI]. We have issues with power failures and all that. EMR does not affect the actual time that I spent with a patient. I spent

more time entering data into the system than with patients. (personal communication, September 15, 2014)

GH-PD6 had the following to say:

It has reduced patient/doctor interaction time, because I spent more time, trying to understand how to use EMR than actually interacting with my patients. If I had spent more time with my patients, it would bring out a lot of interaction between us. EMR has taken away the relationship between doctors and patients. By spending more time with patients, they would have opened up. There are patients that I spent 45 minutes with, and the intention is to bring out psychogenic problem, take for instance, compared with someone that has malaria symptoms, where I may spend 10 minutes. You would be able to explore patients' issues if you had spent more time with them. By spending more time, your patients would have more confidence in you. (personal communication, September 16, 2014)

Table 50 provides a summary of participants' responses.

Table 50

Impact of EMR on PBMR on Doctor's Time With Patients

Responses from participants	Frequency as stated by participants from EKSUTH	Frequency as stated by participants from GHI
EMR has increased the time that I spent with my patients	-	8
EMR has reduced the time that I spent with my patients	-	4
EMR is cumbersome and unfriendly		2
I see fewer patients with PBMR records	8	-
More training is needed on EMR	-	2
Neither EMR nor PBMR has affected the number of patients that I see in a day	-	1
Missing case notes is common with the use of PBMR	4	2
With PBMR, there is no effect on the time that I spent with my patients	2	-

The categories that emerged from the analysis of my second research question are (a) benefits of EMR and PBMR, (b) improvement in quality of care after EMR deployment, (c) impact of EMR and PBMR on accuracy of patients' information, (d) enhancement of research and improvement in quality of healthcare, (e) prevention of adverse effects, (f) alerts or reminder mechanism, and (g) exposure to safety problems.

Benefits of EMR and PBMR

Participant EK-PD2 stated that he had no experience in using EMR. However, the

participant had this to say:

> Based upon what I have heard, EMR can save time on the side of the patients. It allows the doctor to spend more time counselling the patient, which is very important. It is not just about prescription, counselling is also important. Keeping the information [of patients] in EMR and retrieving them should be easier. (personal communication, September 18, 2014)

Participant EK-PD5 felt that EMR would make consultation with patients better. The participant based this on the demonstration of an EMR system in one of the seminars that the participant has attended in the past. Participant GH-PD11 stated the following:

> With EMR, you would have more space to keep information than [PBMR]. The space on EMR could be unlimited, and this could allow for keeping records of patients for a very long time. The second benefit with EMR is that doctors could access the record of the patients, even if the patients had been in another general hospital that is electronically integrated with us. EMR is good for easy retrieval of patients' information. (personal communication, September 26, 2014)

GH-PD4 stated the following:

> I think that if EMR were implemented correctly, it should shorten the time spent with patients. It should make things easier to retrieve patients' data, such as drugs information. It will also help us in a follow-up treatment, especially if they have been coming for a while. But if it were [PBMR] patients could lose their cards or case notes, and this could lead to wrong diagnosis since there would not be enough information that could be referenced. We have to start all over again.

With e-Medicine [EMR], we would have received all information about previous treatments. (personal communication, September 17, 2014)

Table 51 is a summary of participants' responses.

Table 51

Benefits of EMR and PBMR

Responses from participants	Frequency as stated by participants from EKSUTH	Frequency as stated by participants from GHI
I do not notice any benefit of EMR over that of PBMR	-	1
EMR has saved treatment time	-	3
EMR would allow for more storage of data	2	1
EMR would mitigate the loss of case notes	6	1
Data retrieval is faster with EMR	4	8
I will be able to see more patients in a day with EMR	-	1

Improvement in Quality of Care After EMR Deployment

Since EKSUTH does not have EMR, participants in this hospital were not asked this question. Responses from GHI are as indicated below.

GH-PD1 opined that:

EMR has not really changed the diagnosis. It has not changed the diagnosis that I have made for anyone whether I used EMR or not. Even the paper I have is well kept. I can always go back through the file of the patient and find information about my patients. I know it is faster to get patients information on EMR when

searching records, rather than leafing through paper. But EMR has not really changed how I diagnose diseases in this hospital. (personal communication, September 15, 2014)

Participants GH-PD11 stated the following:

EMR has limited the doctors' ability because it is hard to use. There is no uniformity among the departments. Some departments here have not implemented EMR fully. In effect, it has not been fully integrated. You will think that after sending information to the lab, you would expect to get the result via EMR. But since they are not using it, you will write it on paper, and then have to input the information again into the EMR. In some of the tests, they will tell you that they cannot be done in the hospital, and we had to send them [patients] to go and do the tests outside of our hospital. (personal communication, September 26, 2014)

Table 52

Improvement in Quality of Care After EMR Deployment

Responses from participants	Frequency as stated by participants from EKSUTH	Frequency as stated by participants from GHI
EMR has not affected my diagnoses	-	1
I have not seen any improvement	-	7
I have seen some improvement	-	4
The system needs to be fully integrated	-	1

Impact of EMR and PBMR on Accuracy of Patients' Information

Participant EK-PD4 reported the following:

> When patients' cards are lost, or some documents are missing in [PBMR], it has negatively affected my work because the information that I may need are no longer available. For example, when patients came back for a follow-up treatment, I may not have the information that I would need to continue with the treatment. What I ended up doing is to start with some leading questions that could help me remember the drugs that I have prescribed before. (personal communication, September 18, 2014)

Another participant, EK-PD9 stated that:

> Losing case notes has affected the accuracy of the information that I got on my patients before treatment. Once there is nothing to depend on, I have to start all over again. This process can be very stressful, and my patients are not happy about this. (personal communication, September 19, 2014)

Participant GH-PD1 stated the following:

> EMR has helped because patients may have been sent by a junior doctor, who has already documented everything or has made some diagnoses. As a senior physician, I could end up with treating those patients in about six months later. And since the information is available to me, I can see whether some diseases are progressive or not because the trend has been well documented and preserved in EMR. (personal communication, September 15, 2014)

Participant GH-PD10 had this to say:

> The accuracy of the information is dependent on what is entered into EMR or [PBMR]. So, in that case, there is no effect on the accuracy of information that I got on my patients before treatment. I know that in developed world or the first world that they are gradually shifting to EMR, and I also understand that it has not been fully adopted. Medicine is a culture, and senior doctors are used to the way we used to document on [PBMR]. The change has not been easy, but change does come with merit. As a young doctor, I support EMR. (personal communication, September 26, 2014)

Table 53 is a summary of responses from my participants.

Table 53

Impact of EMR and PBMR on Accuracy of Patients Information

Responses from participants	Frequency as stated by participants from EKSUTH	Frequency as stated by participants from GHI
Accuracy is dependent upon the person who enters the record	3	1
There are too many cases of missing case notes with PBMR	10	-
The use of EMR has improved accuracy of patients' medical records before treatment	-	4
There is no difference in accuracy of patients information on the use of EMR or PBMR	-	8

Enhancement of Research and Improvement in Quality of Healthcare

Participant EK-PD1 stated that he has no experience on EMR, but based upon what he heard or learned from others, he had the following to say:

> [PBMR] is cumbersome. For instance, if you want to calculate mortality rate in this hospital, it would be difficult. If you have to get an average record, you will have to spend a lot of time. With EMR, you will be able to compute the rate of morbidity or any other variables. Besides, you can get a percentage of infant's mortality in a particular month. With EMR, you can get a better chance of finding this average or percentage than [PBMR]. (personal communication, September 18, 2014)

Participant EK-PD6 stated that "[PBMR] is cumbersome to use for research purposes especially when documents are lost. Sometimes, when patients' records were no longer available, it has been difficult to follow trends in treatment" (personal communication, September 19, 2014).

GH-PD1 opined thus:

> We are still at the baby stage of the whole problem. If things have been optimal, it will help to enhance our quality of care. To retrieve some records of patients in a system that works very well, all you need to do is click a button and get information of patients, including those who have been coming to our hospital for a long time. But as it is now, there are some patients that have come even for years, and some of their documents have been destroyed or thrown away. With EMR, it won't be so because the information will be preserved even for a very

long time. EMR will not complain about the size of the information, unless you exceeded the storage of the computer or need to add more storage. (personal communication, September 15, 2014)

GH-PD8 stated the following:

Our clinical research has improved because we can now get more information on our patients, even on those who have been coming for a long time. We were thus able to use this information to learn more about our patients and what has been done for them in the past. (personal communication, September 25, 2014)

Table 54 is a summary of responses from participants.

Table 54

Enhancement of Research and Improvement in Quality of HealthCare

Responses from participants	Frequency as stated by participants EKSUTH	Frequency as stated by participants GHI
EMR has enhanced research and monitoring of healthcare	1	6
EMR has not enhanced any research or monitoring of healthcare	-	6
Neither EMR nor PBMR has improved the quality of healthcare	1	-
PBMR has not enhanced research or monitoring	12	-

Prevention of Adverse Effects

Participants were asked about the impact of EMR and PBMR in preventing adverse effects. Participant EK-PD1 commented that:

> Adverse effects? Maybe in terms of treatment. In managing a patient, you need to be conscious of time. If there is a waste of time, you can lose life in a second. If I sent a patient for a laboratory test, and if I got the information on time some adverse effect could be prevented. There are too much time wasted with the use of [PBMR]. The traditional way of managing patients' record has not prevented any adverse effect. (personal communication, September 18, 2014)

Another participant (EK-PD6) stated that "With accurate information on [PBMR], we can read the patient history, and this could help us in preventing adverse effects. But when documents are lost, it could be difficult" (personal communication, September 19, 2014).

GH-PD6 stated the following:

> If I have to compare EMR in with [PBMR], I will say that [PBMR] has even been more helpful because most clinicians don't even have access to the EMR in this facility. With [PBMR], if I see a patient, I can see if my patients have reacted to some drugs, I can get the information. For example, if one of my patients reacts to sulfonamide, the nurses can get the information from the [PBMR] easily because she has access to the information by asking for records at medical records department. Whereas, if it had been EMR, the nurse may not have access to that information. (personal communication, September 17, 2014)

Responses from participants are as summarized in Table 55 below.

Table 55

Prevention of Adverse Effects

Responses from participants	Frequency as stated by participants from EKSUTH	Frequency as stated by participants from GHI
EMR has been helpful in preventing adverse effects	-	9
EMR has not been helpful in preventing adverse effects	1	2
Neither EMR nor PBMR has been helpful	-	1
PBMR has been helpful in preventing adverse effects	3	-
PBMR has not been helpful	9	-

Alerts or Reminder Mechanism

Participant EK-PD2 stated that "[PBMR] does not provide us with any alerts or reminders. We get contacted by staff on duty for any patients' critical or adverse conditions" (personal communication, September 18, 2014).

Participant EK-PD9 echoed similar response. This participant stated the following:

> I check my schedule daily to remind myself if I had to see a patient. We also get calls from hospital staff in case there is an emergency. Moreover, we also have intercom system within the hospital to alert us, should it be necessary. (personal communication, September 23, 2014)

GH-PD10 stated the following:

> We do not have a reminder or maybe it has not been activated. And if it has been activated, I do not know about it. I used my calendar or get called by hospital staff on patients whenever I am not on duty. We have not gotten to that level. We are still in developing stage. We have intercom here that can remind me if I am anywhere in the hospital. (personal communication, September 26, 2014)

GH-PD11 had this to say:

> I do not know if our EMR here has an alert system. However, I used my calendar as a reminder. Hospital staff will call me if I am not on site for any emergency. While I'm on the site, we have an intercom that can be used to call me. The best we have for now is intercom for paging within the hospital. Note that we always have doctors on call that could attend to patients at all time. (personal communication, September 26, 2014)

Table 56 is a summary of the responses that I got from participants.

Table 56

Alerts or Reminder Mechanism

Responses from participants	Frequency as stated by participants from EKSUTH	Frequency as stated by participants from GHI
Alerts from EMR are helpful	-	1
We got alerts from hospital staff	12	8
Alerts or reminder component has not been implemented in our EMR at GHI	-	9
I don't know if alerts or reminder component has been implemented at GHI	-	2

Impact of EMR and PBMR on Exposure to Safety Issues

Participant EK-PD6 stated that "[PBMR] is cumbersome. We can only deal with what we have at hands. If documents are lost, it will be difficult to prevent potential problems" (personal communication, September 19, 2014). Participant EK-PD2 responded that "With properly documented information on [PBMR], and by doing meticulous work within our limited resources, we have tried to avoid grave consequences to ensure better patient care" (personal communication, September 18, 2014). GH-PD8 stated that "Time spent with patients is very crucial. With EMR we have been able to avoid grave consequences for patients because we were able to respond to their needs on time" (personal communication, September 25, 2014).

Table 57 provides a summary of responses from participants.

Table 57

Impact of EMR and PBMR on Exposure to Safety Issues

Responses from participants	Frequency as stated by participants from EKSUTH	Frequency as stated by participants GHI
EMR has been helpful	-	8
EMR has not been helpful	-	4
PBMR has been helpful	1	1
PBMR has not been helpful	11	-

The categories that emerged from the analysis of my third research question are: (a) provision of adequate information for patients, and (b) access to healthcare information.

Provision of Adequate Information to Patients

Participants were asked if their respective hospitals have provided them with adequate information at the time of their arrival. EK-PP4 stated that the information supplied was sufficient. GH-PP8 stated that "They did not provide me with enough information, during the time of my arrival. I have to keep asking other patients for some information sometimes" (personal communication, September 18, 2014). GH-PP7 stated that he was provided with adequate information at the time of arrival.Table 58 is a summary of responses from participants.

Table 58

Provision of Adequate Information to Patients

Responses from participants	Frequency as stated by participants from EKSUTH	Frequency as stated by participants from GHI
The information provided is adequate	11	7
The information provided is not adequate	1	5

Access to Healthcare Information

EK-PP3 stated that "I only have access when I came here to see doctors. This is because I am the one carrying my own documents and case notes to various departments during treatment" (personal communication, September 18, 2014). GH-PP8 had this to say:

> Before EMR deployment, they will search for papers for 2 hours, and they will come back and tell you that they do not see your papers. But now, it is very fast. I think I could easily have access to my information if I needed it. (personal communication, September 25, 2014)

GH-PP9 stated the following:

> I do not have access per se, but I can always ask for my any information about myself, and they will respond very fast. If you misplaced your card, and you tell them your number, EMR will bring everything out. And like I mentioned earlier, I do not have access to my personal records. However, the healthcare workers in the medical records department and the doctors do have access to them. (personal

communication, September 25, 2014)

Table 59 is a summary of responses from participants with respect to having access to their medical records information.

Table 59

Access to Healthcare Information

Responses from participants	Frequency as stated by participants from EKSUTH	Frequency as stated by participants from GHI
I do not have a need for it, unless during treatment	-	4
I can always ask for my information on EMR from medical records department or my doctor	-	1
I do not have access to my healthcare information on EMR	-	8
I have access to my healthcare information on PBMR because I carry them with me during treatment	12	-

Discrepant Cases

One discrepant case that I noted during the collection of the data was that one of the participants stated that case notes that were missing were probably due to sabotage by those who do not like some patients! I did not include this in analysis because all other respondents attributed the loss of case notes to misplacement in the medical records department or may have been lost in transit between departments.

Summary of Findings by Research Question

A research study that included a total of 48 participants from two hospitals was done to explore how the use of EMR or PBMR has influence the time that doctors spent with their patients. This interview was conducted from September 15, 2014 until September 26, 2014. The proposed research methodology as described in Chapter 3 was implemented accordingly, and the data collected were analyzed with Nvivo 10 software. There were two different interview schedules used. The first one (Appendix A) was targeted to patients, and the second one (Appendix B) was for doctors.

The categories that emerged from all the research questions in the transcribed interviews are (a) time to complete registration, (b) procession time to replace lost card, (c) experience on time to locate patients' information before treatment, (d) impact of EMR and PBMR on processing time to complete treatment, (e) impact of EMR and PBMR on doctor's time with patients, (f) benefits of EMR and PBMR, improvement in quality of care after EMR deployment, (g) impact of EMR and PBMR on accuracy of patients' information, enhancement of research and improvement in quality of healthcare, (h) prevention of adverse effects, (i) alerts or reminder mechanism, exposure to safety problems, (j) provision of adequate information for patients and, (k) access to healthcare information.

The three research questions for these case studies were (a) How does the use ofEMR influence patient-processing time in Nigeria (b) How does the use of EMR in the treatment of patients impact the quality of healthcare in Nigeria, and (c) How does the

use of EMR influence access to their healthcare information in Nigeria? My findings to these research questions are subsequently discussed.

In response to the first research questions, 8 patients participants at GHI (the hospital that uses EMR) agreed that it took less time to complete registration, whereas only 4 stated that it took less time to complete their registration at EKSUTH (the hospital that uses PMBR); 4 out of 5 patient participants at GHI who have lost their patients' card stated that it did not take that long, replace it, 1 out of 3 at EKSUTH echoed the same sentiment.; 9 patients out of 12 at GHI stated that it did not take long to locate their information before treatment, whereas 6 patient participants shared the same thought. On the time spent with patients, 8 doctor participants stated that the use of EMR has allowed them to spend more time with their patients, while 4 of them stated that it has reduced their time, and stated that they would need more training on EMR. At EKSUTH, 8 doctors stated that they see fewer patients with the use of PMBR, and most complaints have been due to missing case notes. Based upon the responses to the first research questions, the experience of patient and doctors participants in patient-processing time support the claim of Calder (as cited in Smith, 2011) that the use of EMR has allowed doctors to spend more time with their patients. On the other hand, those who disagreed with EMR as a saving time device underscored Brewin (2006) that EMR does not save time.

The influence of EMR on the quality of healthcare in Nigeria, with respect to the second research questions is debatable. At GHI, 8 doctor participant stated that retrieving patients' information in EMR is very fast, however, 7 of them did not see any

improvement in quality of healthcare. Out of 12 doctor participants at GHI, 6 of them stated that EMR has not enhanced any research or monitoring that could have improved quality of healthcare. Doctor participants at EKSUTH agreed that PBMR has not improved quality of healthcare in Nigeria. They attributed the failure to consistent loss of case notes. The assumption that EMR can improve the quality of care by Gilmer, et al (2012) was not supported by doctor participants at GHI. The problem of integration with respect to wrong data or misinformation was supported by Mendelez (2012) who noticed the failure of EMR in processing wrong data at Brigham and Women's hospital and Massachusetts General Hospital in 2008, which has raised significant safety implication. Synchronization of data with correct patients' information can enhance quality of healthcare. Doctors at GHI echoed their concern on non-integration of their EMR system (eHealth).

Patient participants at GHI and EKSUTH responded to the third research question on how the use of EMR and PBMR has influenced access to their healthcare information. Patients at EKSUTH stated that since they carry their own case notes they can easily look at their healthcare information. However, this is only accessible at the time of treatment in the hospital. At EKSUTH, 11 out of 12 patients admitted that they were provided with enough information about their healthcare at the time of their arrival. However, 7 out of 12 patients at GHI stated the same. At GHI, 4 patient participants stated that they do not have a need to see their healthcare information unless they were in for treatment. Eight patients at GHI stated that they do not have access to their healthcare information.

In the United States, portal for consumers' access to eHealth is proliferating nationally (Zarcadoolas, Vaughon, Czaia, Levy, & Rockoff, 2013). Whereas, at GHI patients were not too concerned about access to their healthcare information. Chapter 5 contains a discussion of the study findings, limitations of the study, recommendation, implications, and conclusions.

Chapter 5: Discussion, Conclusions, and Recommendations

In this research study, I conducted an in-depth interview with 24 doctors and 24 patients in two different hospitals in Nigeria. The purpose of this research was to explore by qualitative means how EMR implementation has affected the time that doctors spent with their patients in comparison with the hospital that uses only PBMR. I have selected case-study methodology to seek answers to the research questions. I compared a case in which PBMR were used and a case in which an EMR system was implemented in order to address whether any time saved during treatment of patients by their physicians had been used to provide further care for the patients. By examining the healthcare delivery systems of the two medical centers (EKSUTH and GHI) in Nigeria, I explored the time devoted to EMR and PBMR, and the time that physicians actually spent with their patients.

The key findings of these case studies were that physicians in Nigeria embraced the need for EMR to assist in improving the quality of healthcare in their country. However, there is a need for more training in order to appreciate the benefits of implementing EMR. Doctors and patients at GHI noted that EMR has decreased processing time at registration. However, they stated that the technology has lengthened the time that they spend with patients, but in a negative way: Doctors spent more time on understanding EMR rather than devoting the saved time to patient-care. EMR has not impacted patients' access to their healthcare information because they did not see any need for it.

Doctors at GHI and EKSUTH saw the role of government in proliferating the use of EMR. These participants also complained that incessant power failures were responsible for their refusal to completely embrace EMR. While most physicians admitted that they were used to the traditional method of record keeping (PBMR), they were willing to embrace the change to the EMR system. Patients at GHI also noticed an improvement in the hospital's registration process. However, they still felt that the waiting time to see their doctors was too long.

Interpretation of Findings

The conceptual framework for this research was informed by TTF. Task-technology theorists argue that information system use and performance benefits must be aligned with the task for which it is intended (Dwivedi et al., 2012). Galbrath (1973) asserted that the premise upon which TTF is built is that an outcome is predicated upon the degree of alignment (as cited in Dwivedi et al., 2012). Goodhue and Thompson (1995) created the task-technology fit model that focuses on the alignment of certain systems with specific tasks. The fit is to match the capabilities of technology with the requirements of the task by measuring the degree to which the technology would assist an individual in performing a task (Robles-Flores & Antonio, 2012). Doctor participants at GHI embraced EMR as a technology device that can assist them in performing their individual task. However, they felt that the system deployed at their hospital was not properly integrated and that this has affected their performance and quality of work. Participant GH-PD5 had this to say about their EMR:

You know like I said, this hospital was one of the pioneers to ask for EMR

> mentor. Not all the departments have been linked, even up till today. However, most have been linked. Some departments like the one that takes care of HIV, physiotherapy, and dental are not linked and this has limited transferring data to the aforementioned departments. (personal communication, September 15, 2014)

Task-technology fit theorists argue that information system use and performance benefits must be aligned with the task for which it is intended (Dwivedi et al., 2012; Kuo & Lee, 2011).

According to Kuo and Lee (2011), users will embrace technology that will allow them to complete their tasks with maximum benefits. Six participants at GHI agreed with the task-technology fit theorists in that after the deployment of EMR at their hospital, they have seen some improvement in their performance. For example, participant GH-PD8 stated, "Our performance has improved. We can get to patient's information faster. We can diagnose cases faster than in the past. Moreover, we have been able to see more patients per day" (personal communication, September 25, 2014).

Ways Findings Confirm, Disconfirm, or Extend Knowledge

The research findings in this study were consistent with similar findings in peer-reviewed literature that deployment of technology such as EMR, if well aligned to the task, can influence utilization and performance (Kuo & Lee, 2011). For example, six of the doctor participants at GHI stated that EMR has actually improved their performance. Participants GH-PD9 had reported that "[their] performance has improved. We can get to patient's information faster. We can diagnose cases faster than in the past. Moreover, we

have been able to see more patients per day" (personal communication, September 25, 2014).

CIS was designed to ease the retrieval and management of all hospitals administrative information in order to improve the quality of health care (Van de Velde, 2003). Participant GH-PD1 has not seen any improvement in the quality of healthcare at GHI. However, this participant noticed the ease of retrieval of patients' data. Participant GH-PD1 had this to say:

> EMR has not really changed the diagnosis. It has not changed the diagnosis that I have made for anyone, whether I used EMR or not. Even the paper I have is well kept. I can always go back through the file of the patient and find information about my patients. I know it is faster to get patients information on EMR when searching records, rather than leafing through a paper. But EMR has not really changed how I diagnose diseases in this hospital. (personal communication, September 15, 2014)

For EMR to have any added value, Van de Velde (2003) argued that it must have a user friendly interface that should provide a faster response time that is adaptable to clinicians' daily practice. Participant GH-PD4 at GHI agreed with Van De Velde that EMR must be user-friendly. Participant GH-PD4 stated that the system (eHealth) that the hospital uses was user-friendly but still needs some improvement. The participant opined that a user-friendly system would allow for faster retrieval of data and would likely decrease the waiting for patients. Van de Velde stated that a long term objective of health care is the provision of EMRs in the form of texts, waves, and images that could be kept

for a long time. According to Van de Valde, these provisions are not obtainable in a manual entry system. Chen and Frank (2011) agreed that PBMR is not ideal for long-term storage because the document could be damaged after a long period of storage. Participant GH-PD11 at GHI also agreed with Van de Valde that EMR is useful for maintaining patients' record for a long time. This participant had this to say:

> With EMR, you would have more space to keep information than [PBMR]. The space on EMR could be unlimited, and this could allow for keeping records of patients for a very long time. The second benefits with EMR is that doctors could access the record of the patients, even if the patients had been in another general hospital that is electronically integrated with us. EMR is good for easy retrieval of patients' information. (personal communication, September 26, 2014)

Some physicians such as Calder (as cited in Smith, 2011) stated that the use of EMR has saved him from going through endless paper charts, which has allowed him to spend more time with his patients. According to Smith, Calder felt that by spending more time with his patients, he has been able to provide better care for them. Brewin (2006) disagreed with Calder. Brewer argued that EMR has not saved time and that this could have been responsible for the low rate of adoption. Participant EK-PD2, who had not used EMR, agreed with Calder that the use of EMR would allow him to spend more time with patients and be able to see more patients per day. Participant GH-PD10 echoed Brewin's thought. This participant considered the use of EMR as a relief from PBMR. However, he stated that EMR has actually decreased the time that they actually spent with their patients. He attributed this decrease to incessant power failure and technical

problems with their software. GD-PD10 stated that the increase in the time that he spent with patients was not devoted to patient's care. He bemoaned the double work that he had to do with writing case notes of patients on paper and reentering this information into their EMR as well.

Participant EK-PD10, who is used to PBMR, stated that time spent with patients is predicated by the individual's ailment. Participant GH-PD1 stated that EMR has not affected the actual time that she spent with her patients. GH-PD6 stated that he spent more time trying to understand how to use EMR than actually interacting with patients. GH-PD6 agreed that he would have been able to improve the quality of healthcare if he had spent more time with his patients. This participant had this to say:

> [EMR] has reduced patient/doctor interaction time, because I spent more time, trying to understand how to use EMR than actually interacting with my patients. If I had spent more time with my patients, it would bring out a lot of interaction between us. EMR has taken away the relationship between doctors and patients. By spending more time with patients, they would have opened up. There are patients that I spent 45 minutes with, and the intention is to bring out psychogenic problem, take for instance, compared with someone that has malaria symptoms, where I may spend 10 minutes. You would be able to explore patients' issues if you had spent more time with them. By spending more, your patients will have more confidence in you. (personal communication, September 16, 2014)

Doctors at GHI reported their concerns on a possible loss of data during a power failure or when system crashes. Harrington et al. (2011) argued that a loss of data during

system crashes, a loss of connectivity, and keypad entry error can result in unintended consequences. Participant GH-PD9 commented that his productivity had been negatively affected when system crashes or during downtime. Participant GH-PD9 reported the following:

> EMR has been down quite a few times because of non-availability of power supply. This downtime has affected our productivity. We ended up going back to using papers to enter our information. And after that, we would go back and re-enter that information when lights [power supply] came back. (personal communication, September 25, 2014)

This research was conducted at two different hospitals in which one of them deploys EMR to manage their patients' medical records while the second one has not deployed the technology. The goal was to see if deployment of EMR has enabled doctors to spend more time with their patients, and if so, whether any time saved has been used to improve the quality of healthcare in their community. I believe that I have contributed to science in that I interviewed doctors and patients to support the claim of Calder that deployment of EMR has enabled physicians to spend more time with their patients, which has led to an improvement in quality of care (as cited in Smith, 2011). Those who disagreed with an increase in time spent with a patient attributed it to lack of training and consistent power failure. This is also consistent with Boonstra and Broekhus (2010), who argued that clinicians' lack of technical knowledge to deal with EMR may have been responsible for their resistance to embracing the technology. Boonstra and Broekhus stated that some physicians argued that EMR is unnecessarily too complicated and too

limited in its capability, when compared to paper-based manual entry system.

Some participants at GHI agreed. For example, participant GH-PD10 stated that he found it easier to document his work on paper. According to this participant, he spent more time on trying to figure out how to use eHealth, rather than spending the time with his patients.

Limitations of the Study

The limitation of this study was that the research findings cannot be generalized to the general population because "applying generalizations from aggregated data of enormous random samples to individuals is hardly useful" (Merriam, 2009, p. 224). Moreover, I conducted this study using nonprobability purposive sampling, which does not guarantee that every unit of the population will have some chance of being included in the sample (Frankfort-Nachmias & Nachmias, 2008). I opted for a nonprobability purposive sampling method because it would be impractical to select a sample that is large enough to be a probability sample.

Another limitation of this study was the limited timeframe to collect data, and the time of engagement of participants was not long enough. Although English language is the official language of communication in Nigeria, everyone does not speak English in that country. Therefore, I did not include this group. This elimination could also impact the quality of the data. The deployment of EMR to improve the quality of healthcare cannot be ascertained in that the majority of complaints at a hospital that deployed the technology were with consistent power failure. As a result of this, GHI could not fully realize the full benefits of their EMR (eHealth).

Recommendations

I considered a comparative case study as the most appropriate method for this study because it involved a comparison of two different scenarios: a hospital that uses EMR and another one that uses the traditional method of record keeping (PBMR). Qualitative research allows more freedom than other approaches in that it allows the researcher to adjust the process as his or her project develops (Moses & Knutsen, 2007). For example, the initial plan for research is difficult to prescribe, and the process can be changed or modified because it "points beyond the object immediately at hand" (Moses & Knutsen, 2007, p. 139). In this research study, I explored how the use of EMR has impacted the time that physicians spent with their patients in a hospital that uses EMR and compared it with the one that has not deployed the technology.

Previous research methodologies employed in previous task-technology fit theory had mostly used quantitative approach (Gu & Wang, 2013). I recommend further research in qualitative and quantitative studies to triangulate the research findings in this multiple case studies. Moreover, I recommend that a study of this nature be carried out for at least 8 weeks, considering the fact that I had to interview 48 participants over a period of 2 weeks.

In my studies, I noted that all participants embraced the deployment of technology. However, consistent power failure contributed to the refusal of my doctor participants to totally use EMR. I therefore recommend that the Nigerian government ensures a constant power supply. Incessant power failure can lead to data loss. Harrington

et al. (2011) argued that a loss of data during system crashes can result in unintended consequences.

The Nigerian government must ensure that eHealth or any EMR system that they will be using at any hospitals be fully integrated with other departments in those hospitals. According to Melendez (2012), the EMR that he deployed with his team was processing some wrong data for patients when the system that they deployed at Brigham and Women's hospital and Massachusetts General Hospital in 2008 was not fully integrated. Melendez and his team were able to recognize this quickly and corrected it before any damage was done. Harrington, Kennerly, and Snyder (2011) recommended that healthcare leaders should understand the complexity of his technology and as such should use vendors that comply with sound design, development, and usage. Participants at GHI stated that their state government would be replacing their eHealth with another EMR system that is easier to use than their current system. They stated that eHealth was too complicated for them to use.

In spite of my participants' desire to embrace changes, they mentioned that they were not properly trained in the use of their EMR system. This is consistent with Boonstra and Broekhuis (2010), who argued that a certain level of computer skills is required to master the complexity of hardware and software of EMR system. Higgins et al. (2012) echoed the difficulty of using EMR, stating that, after initial installation, it could take up to 1 year to reach a stable utilization of the system. Of the three legislations (use of evidence-based learning, training, and change management support) stipulated by HITECH Act, training was cited as very difficult for clinicians because of the complexity

of deploying EMR (Fickenscher & Bakerman, 2011). Fickenscher and Bakerman (2011) argued that a scenario in which busy clinicians are being trained for several hours with a system that is unrelated to their practices could be challenging. I therefore recommend that clinicians be provided with training continuously and that it should not be a 1-day training session. I also recommend that Lagos State should complement EMR training at their location with online training.

Implications

Positive Social Change

Walden University defines positive social change as an application of strategies, ideas, and actions that could enhance the development of society (Walden, n.d.). The positive social change in this study was how time spent with doctors could improve the quality of healthcare in Nigeria if EMR is deployed in all hospitals across the country. GH-PP9 agreed that he would get better care if his doctor had spent more time with him. Participant GH-PD6 (a medical doctor) concurred with participant (GH-PP9). According to this doctor, by spending more time with his patients, he believed that they will open more to assist in diagnosing the cause of their ailment. Moreover, patients would have more confidence in him (personal communications, September 16, 2014).

Quality of care will likely improve in Nigeria with the government's assistance in proliferating the use of EMR in all hospitals in the country. Reed (as cited in Document News, 2012) argued that quality of healthcare can also be improved by EMR deployment in an outpatient department to reduce negative events. Researchers examined medical records of 169,711 diabetic patients over 1 year of age at Kaiser Permanente diabetes

clinical registry before and after deployment of Kaiser Permanente HealthConnect (an EMR system) (Document News, 2012). In their findings, they noted that fewer patients visited the medical center emergency room. According to Reed, this improvement in quality of care could be attributed to the cumulative effect of EMR deployment at Kaiser Permanente.

Participants recognized the benefit of EMR and they were willing to embrace it. They complained that they needed more training. With improvement in quality of care at hospitals that have deployed EMR, Nigerian government could be encouraged to provide more trainings for doctors and other clinicians in the country, which would likely contribute to further improvement in quality of healthcare in Nigeria.

Conclusions

I conducted this research to explore the influence of EMR on the time that doctors spent with their patients, and to find out how spending more time has influenced the quality of healthcare in two of Nigerian hospitals. While some participants admitted that EMR has allowed them to spend more time with their patients, a few of them stated that the length of time was due to technical problems and constant power failures. Patients at the hospital (EKSUTH) that did not deploy EMR were not too happy about their waiting time and the consistent loss of case notes. In spite of their frustrations, they were still satisfied with their doctors. Patients at GHI saw a decrease in work-flow processing time. Doctors at GHI also acknowledged that the use of EMR has decreased the waiting time for registration.

Doctors at EKSUTH and GHI acknowledged the potentials of EMR deployment and fully embraced it. However, they believed that EMR deployment should be left for the government in order to increase its usage. Based upon my conversation with doctors at GHI, it appears that they have not fully enjoyed the benefits of EMR deployment at their hospital because of incessant power failures. In my conversation with doctor participants, they also attributed their frustrations to using EMR to lack of training. This has allowed me to think that government should continue to provide continuous training to doctors and to integrate EMR fully in all departments at hospitals in which they are deployed. With time and understanding of EMR, doctors in Nigeria will be able to use the technology more effectively to improve the quality of healthcare in that country.

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Appendix A: Questionnaire on electronic medical records and paper-based medical records

The Interview Schedule for Patients

Date and Time of Interview

Date of Interview: _____/_____/_____

Start Time of Interview: _____ End time of Interview: _____

Assigned Identifier: _____

Does the Hospital have EMR? Yes _____ No _____ EMR & Paper-Based _____

The Interview

1. Describe the type of medical insurance coverage that you have?
2. How would you describe your experience on the time it took to complete your registration?
3. If your old card has been lost before, describe your experience on the process and the time that it took to replace it.
4. How would you describe the level of caring by your doctor?
5. Can you comment on how long it took for the physician to locate your information before providing any treatment?
6. How satisfied are you with your treatment today?
7. If you have been with the same doctor for at least two times within the same month, can you describe your experience on the processing time to complete your treatment?

8. What were your expectations of medical treatment if the doctor had spent more time with you?
9. How satisfied are you with the doctor's skill level?
10. Why did you choose this hospital over other similar hospitals in your area?
11. What do you think about the type of equipment used for your treatment?
12. What is your satisfaction with the overall cleanliness of the hospital?
13. How likely would you recommend your doctor to other patients?
14. How satisfied are you with the doctor's care?
15. How would describe how the doctors kept you informed about your healthcare?
16. Describe the level caring by your doctor.
17. How would you describe the friendliness and courtesy of the doctors that have attended to you?
18. How attentive were your doctors?
19. How comfortable are you with your doctor?
20. How would you describe the availability of doctors to patients for treatment?
21. How satisfied are you with the cost of treatment that you have received today?
22. Can you describe how the treatment by your doctor has affected your condition before your visit to the hospital?
23. How would you describe the physical environment such as noise, temperature or cleanliness?
24. Describe the adequacy of information provided for you during the time of your arrival.

25. How has the use of EMR or paper-based medical records provide access to your healthcare information?
26. To what degree did your treatment by your doctor meet your expectation?
27. What are the advantages or disadvantages that you observed in the use of EMR or paper-based medical records?
28. Can you describe your experience with the work process between registration and the time you left the hospital?
29. What improvement would you suggest on the level of caring that you got from your doctors in the hospital?
30. What is your overall impression of the hospital on meeting your expectation on receiving healthcare?

Appendix B: Questionnaire on electronic medical records and paper-based medical records

The Interview Schedule for Doctors

Date and Time of Interview

Date of Interview: _____/_____/_____

Start Time of Interview: _____ End time of Interview: _____

Assigned Identifier: _____

Specialty: _____ Years of Experience: _____

Does the Hospital have EMR? Yes _____ No _____ EMR & Paper-Based _____

*The Inter*view:

1. How has the use of EMR (or paper-based medical records) affected the number of people that you see on a daily basis?
2. If you have seen the same patients repeatedly more than 2 times within a month for the same treatment, can you describe how EMR (or paper-based medical records) has contributed to assisting you in retrieving information about the patients?
3. What do you think were the greatest contributing factors to patients coming back for the same treatment once the patient has been discharged, based upon your patients' feedback?

4. How has the use of EMR (or paper-based medical records) affected the time that you spent with your patients?
5. How would you compare the ease of use of EMR to with the traditional paper-based medical records?
6. What do you consider are the benefits of using EMR in comparison with paper-based medical records?
7. What are the improvements that you noticed in diagnosis and treatment of patients since the deployment of EMR at your hospital?
8. Based upon your experience on using EMR, what do you think could be done to increase its usage?
9. What is the attitude of your co-worker to using EMR as opposed to paper-based manual entry?
10. How has EMR (or paper-based medical records) affected your daily work-flow with respect to productivity?
11. How has EMR (or paper-based medical records) affected transferring of patient data or information from one department to another?
12. How has EMR (or paper-based medical records) affect the operational cost, such as transcription services?
13. How has the use of EMR let pharmacist decipher your prescription of drugs at the right dosages as opposed to writing the prescription by hand?
14. What are your concerns on patient privacy due to possible increase in the amount of health information that could be exchanged electronically?

15. How has EMR or manual record keeping help in documenting your procedure in the treatment of patients?
16. How has the use of EMR or manual record keeping affected the accuracy of information that you got on your patients before treatment?
17. What do you think are the unintended consequences of using EMR (or paper-based medical records)?
18. How does the information provided by the EMR (or paper-based medical records) meet your needs?
19. Describe your experience on ease of the use of EMR in comparison with paper-based medical record?
20. Describe your experience on EMR (or paper-based medical records) with respect to getting the information that you need on time.
21. How does the use of EMR (or paper-based medical records) provide up-to-date information about your patients?
22. How has the performance of your department been affected by the use of EMR (or paper-based medical records)
23. If EMR has been down at one time or the other, how has the down time affect your productivity or performance in comparison with using paper-based medical records?
24. Based upon your experience with EMR, how has this improved the quality of health care that you have rendered to your patients in comparison with using paper-based medical records?

25. How does the use of EMR (or paper-based medical records) enhance research and monitoring for improvements in clinical quality?
26. How does the use of EMR (or paper-based medical records) prevent adverse events in the treatment of patient?
27. How does the use of EMR (or paper-based medical records) support therapeutic decisions?
28. How does the use of EMR (or paper-based medical records) make it easier to consider all aspects of a patient's condition?
29. How does the use of EMR provide clinical alerts and reminders as opposed to the use of manual record entry?
30. How has the use of EMR (or paper-based medical records) exposed potential safety problem to avoid more serious consequences for patients and leading to better patient care?
31. How satisfied are you with the overall facility of this medical center?

Appendix C: Informed Consent Letter

CONSENT FORM

You are invited to take part in a research study to determine how the use of electronic medical records has affected the time that your physicians spent with you from your first visit to discharge in comparison with the traditional method of patients' record keeping. You are one of a large group of patients and physicians from two hospital in Nigeria. This is a formal process of obtaining your written agreement to participate in this study, which is called "informed consent", and it is designed to allow you to understand all aspects of this study before you decide whether or not to take part in this study.

You are selected to be part of this study because you belong to a group that either is identified as patients that are in patients' waiting room of the Outpatient Department, or attending doctors in the Outpatient Department. In addition, one of the specific reasons you were selected for this study is that you are an adult who: (a) came to the hospital on your own, or (b) came to the hospitals without police escort, or (c) are not on sick bed, or (d) is able to express yourself in English language, or (e) you are a doctor who is a general practitioner in the outpatient department.

This study is being conducted by a researcher named Gbenga D. Abimbola, who is a doctoral student at Walden University.

BACKGROUND INFORMATION:

The purpose of this research is to explore by qualitative means how electronic medical records (EMR) implementation has affected the time that doctors spent with their patients in comparison with the traditional method of patients' record keeping.

PROCEDURES:

If you agree to be in this study, you will be asked to:

- Answer a series of questions
- Take about 30 to 45 minutes to complete an interview
- You reserve the right to terminate the interview at any time during the interview
- Your healthcare will in no way be affected by participation or non-participation.
- This interview will be recorded.

Here are some sample questions:

For Patients

- Describe the type of medical insurance coverage that you have.
- How would you describe your experience on the time it took to complete your registration?
- How would you describe the level of caring by your doctors?
- How satisfied are you with your treatment today?
- What are your expectations of medical treatment if the doctor had spent more time with you?

For Doctors

- How has the use of EMR (or paper-based medical records) affected the number of people that you see on a daily basis?
- How has the use of EMR (or paper-based medical records) affected the time that you spent with your patients?
- What are the improvements that you noticed in diagnosis and treatment of patients since the deployment of EMR at your hospital?
- Based upon your experience on using EMR, what do you think could be done to increase its usage?
- How has EMR (or paper-based medical records) affected your daily work-flow with respect to productivity?

VOLUNTARY NATURE OF THE STUDY:

This study is voluntary. Everyone will respect your decision of whether or not you choose to be in the study. No one will treat you differently if you decide not to be in the study. If you decide to join the study now, you can still change your mind later. You may stop at any time.

RISKS AND BENEFITS OF BEING IN THE STUDY

Some of the potential risks to this research are as stated below:

- There will be no personal questions such as sexual practices, preference or substance abuse. I would not be asking any of this information because they are not relevant to my study.
- There will be no pressure to encourage participation due to any existing relationship between the researcher and the participant. There will be no personal relationship to influence any participant.
- There will be no negative effects on my participants due to the strictly objective/non-personal nature of my interview.

There are no immediate direct benefits to the individual participants. However, the long-term potential benefits of this study include whether the use of an EMR system (1) is preferred by doctors over traditional record keeping, (2) really saves them time, and (3) results in saved time being used for better patient care.

PAYMENT:

You will not be paid or receive any form of compensation for participating in this research.

PRIVACY:

Any information you provide will be kept confidential. The researcher will not use your personal information for any purposes outside of this research project. Also, the researcher will not include your name or anything else that could identify you in the study's reports. Data will be kept secure by numerical coding of identifiable personal information and by password protected computer files. Data will be kept for a period of at least 5 years, as required by the university.

CONTACTS AND QUESTIONS:

You may ask any questions you have now by calling the researcher's cell phone.
If you have questions later, you may contact the researcher via his email address. If you want to talk privately about your rights as a participant, you can call Dr. Leilani Endicott. She is the Walden University representative who can discuss this with you. Her phone number is 001-612-1210 or email address at irb@waldenu.edu. Walden University's approval number for this study is **08-20-14-0068452** and it expires on **August 19, 2015.**
The researcher will give you a copy of this form to keep.

STATEMENT OF CONSENT:

I have read the above information and I feel I understand the study well enough to make a decision about my involvement. By signing below, I understand that I am agreeing to the terms described above.

Printed Name of Participant _____
Date of consent _____
Participant's Signature _____
Researcher's Signature _____