UNIVERSITY OF GHANA

IMPACT OF ELECTRONIC HEALTH RECORDS SYSTEM ON QUALITY HEALTHCARE AT THE UNIVERSITY OF GHANA HOSPITAL.

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DECLARATION

I state hereby that this work is the outcome of my own studies and that no one at this or an y other university has submitted it for any academic award.

…… ……

NKKANSAH BENJAMIN HAYFORD **DATE**

(I0636285)

CERTIFICATION

I hereby certify that, this long essay was supervised in accordance with procedures laid down by the University.

…….. ……..

DR. GORDON ABEKAH-NKRUMAH **DATE**

(SUPERVISOR)

DEDICATION

For their assistance throughout the studies, this work is devoted to my family.

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LIST OF ABBREVIATIONS

EHR Electronic Health Record

GHS Ghana Health Service

HIS Hospital Information System

HIT Health Information Technology

HMIS Health Management Information System

ICT Information Communication Technology

ABSTRACT

The aim of the research was to evaluate the effect of EHR on quality healthcare at Legon Hospital using the method, structure and outcome of EHR at the Hospital to measure the quality of healthcare. The study sought to achieve its purpose through three objectives by examining the use, behavioural intent, benefits and general EHR's effect on the Legon Hospital among both staff and patients. The study sought to measure its objectives by adopting a qualitative approach with a cross-sectional explanatory design by gathering data through the use of interview guide from a sample size of 11 respondents (6 staffs & 5 patients). The data was analysed using thematic analysis technique. The overview of the main results disclosed that the EHR scheme is mainly used in all hospital departments, with documents being fully maintained using EHR and almost all interview respondents recognized wanting to continue using the EHR. The key findings indicated that, management benefits a lot from the EHR system through quality of patients' records, attending to patients simultaneously, quality requisitions, faster and easier booking of appointment, no discrimination, avoidance of waste, reduction in waiting time and avoidance of harmful delays, respectful and responsive healthcare, end user satisfaction of the system, relative low cost of using EHR among others. The EHR system is however saddled with problem of procurement of the hardware infrastructure, end user inability, billing issues, redundancy issues, waiting time and missing data/information issues. The research therefore concludes that the hospital should support and sustain the EHR scheme and that concrete measures should be taken to curb evolving difficulties faced by the use of the EHR scheme.

CHAPTER ONE

INTRODUCTION

1.0 Introduction

This section consists of the background to the research that provides the summary of Electronic Health Records, their operation and their effect on quality of care. The research problem statement discusses the limitation in the literature of the effect of electronic health records on the quality of care. This chapter comprises of the study background providing an overview of Electronic Health Records, their operation, and their impact on care quality. The study issue declaration describes limiting the impact of electronic health records on the quality of care in the literature. The study's importance shows to what extent this study is deemed crucial within the EHR domain for policy makers and professionals. The study range shows the limit within which this research is carried out.

1.1 Background of the Study

Health information technology (HIT) is considered a significant tool for enhancing the safety and quality of patient care; and among the most successful tools are electronic health records (EHRs). Several countries around the world have started to implement and apply domestic EHRs in order to benefit from the capabilities these systems have. They store, use, and exchange information. Electronic health records (EHRs) are also commonly referred to as electronic medical records (EMRs), and many people use the term interchangeably. (Eva et al, German, 2010). An EHR is a historically generated, used and stored electronic version of the health record of a patient in a paper graph. The EHR attributed to patient is developed, controlled and maintained by an entity of healthcare. (Zhang, R. et al. 2010). Only health

professionals involved in the care of a patient can access and use an electronic health record (Zhang, R. et al 2010). A Personal Health Record (PHR) is a medical record of a patient which only that person or an authorized person can have access to and use. (Zhang, R. et al 2010). Electronic Health record system has been in existence since 1972, however, in countries such as Ghana, the use of EHRs did not start until 2014 ("Ghana adopts electronic health records for patients", 2014). A majority of medical facilities still use paper records.

Four hospitals in Ghana were assessed in 2012 by a science study: Korle-Bu Teaching Hospital (KBTH), Effia Nkwanta Regional Hospital (ENRH), Komfo Anokye Teaching Hospital (KATH), and Tamale Teaching Hospital (TTH). The results were that KATH was the only hospital to have an EHR in location, whereas the remaining hospitals either were in the process of applying one or had no one at all. User adoption was small and the hospitals in transition found it hard to maintain information. Those added to the problems of moving to a complete EHR scheme from a paper recording scheme (Achampong, 2012). Despite the problems, enhancing patient care quality and effectiveness in the medical setting made it worth implementing one. Quality of care is the degree to which health facilities for individuals and people improve the probability of required health results (quality principles). Services must be consistent with presenting professional knowledge (professional practitioner abilities) and meeting healthcare customers ' market expectations. (Buttell, P. et all 2008)

There are three component methods for assessing the quality of care for improvement underlying measurement. The structure, process and outcome are the three components. Additional part of measures for enhancement – balancing measures (Donabedian, 2005). The outcome measures remain the healthcare efficacy and quality's ultimate validators, but sometimes it can be hard to describe them and they have time lags. Process steps are essential in improving quality as they define whether or not clinical care has been correctly

conducted or whether we are doing the stuff we say we should do. They create the significant link from an enhancement view between behavioral modifications and results. (Donabedian, 2005).

1.2 Problem Statement

It is very essential to have precise, reliable and timely data given the complicated nature of healthcare delivery and the many choices that need to be made, sometimes in very difficult conditions. Paper-based records cannot provide flexibility and leverage to Electronic Health Records (EHR) (Jha, DesRoches, Campbell & Donelan, 2009; Hartswood, Proctor, Rouncefield & Slack, 2003) The Health Ministry (Ghana) obviously defines the need for efficient health data system management. Highly complex and often time-critical, dynamic, controlled and knowledge-intensive medical work. (Bonnstra, 2008, Boddy & Bell). In these time-critical, specialized and physically distributed work environments, medical staff must constantly work together to make treatment possible for patients who are sick and/or injured.(Grimson et al. 2000). Cooperation between the medical actors involved in these distributed medical work settings requires extensive coordination. Medical work is strongly controlled by processes and conventions in order to facilitate this coordination. It is backed by a number of techniques used by a big amount of medical performers for many distinct reasons, such as paper-based records and analog movies. Not isolated artifacts, these techniques are social and material components of the job. (Grimson et al., 2000)

Over the years, the government has put in place a number of measures to enhance the quality of care. Unfortunately, these approaches have not yielded the needed results due to the absence of timely and accurate data. On the other side, most developed countries are experiencing changes in care delivery. They do this by embracing various types of health information systems such as electronic medical records, providers ' computerized order

entry and clinical choice techniques (Hartswood, Proctor, Rouncefield & Slack, 2003). This research's concentration is therefore to investigate the effects of EHR and how it is impacting the quality of healthcare.

1.3 General Objective

The overall objective is to evaluate the effect of EHR on quality healthcare at Legon Hospital with the ultimate goal of evaluating the quality of care using the Hospital's method, structure and outcome of EHR.

1.3.1 Research Objectives

i. To study the use of EHR in the Legon Hospital
ii. To determine the behavioral intent to use EHR among staffs in Legon Hospital
iii. To study the impact of EHR on quality of care among staffs and clients in Legon Hospital.

1.3.2 Research Question

i. What are the uses of EHR in the Legon Hospital?
ii. What are the behavioral intents to use EHR among staffs in Legon Hospital?
iii. How does EHR impact the quality of care among staffs and clients in Legon Hospital?

1.4 Significance of the Study

This research can be useful to different stakeholders in both government health and medical health (health ministry, health employees) and academia. For the government, this study can provide a platform for policymakers in the health department to re-design policies and

programs. This will help in promoting the implementation and compliance with the use of EHR among the entire health workers. The study may also enlighten the health care workers on the importance of the use of EHR. This will not only ensure quality of care but also promote productivity and better service delivery. Besides, it may also enlighten health care providers on the best practices in health services delivery. This will ensure safety, efficiency and cost savings for both the provider and recipient of services. This work may help academic formulate theories that will help understand the impact of EHR among workers on quality care. It can also provide them with the knowledge and data on how to use the EHR. In perspective of this, academic journals and other literature resources may be available to the academics on the impact of EHR on quality of care.

1.5 Scope of the Study

This research was restricted to qualified managers and health care providers using EHR at Legon Hospital. This was because those were the staffs providing healthcare directly to the patient using the EHR. Having knowledge on the use of EHR, they could contribute in ensuring quality of care in the hospitals. Only those questions that were approved by the supervisor were included in the interview guide.

1.6 Definition of Concepts

Electronic Health Record is a health record containing all the information in a traditional health record, including a patient's health profile, behavioral and environmental information. The EHR also includes the time dimension as well as content, which allows information to be included across different episodes and vendors, ultimately becoming a lifetime record. (Amatayakul et al, 2005).

Quality of care is a degree that increases the probability of desired health results for people and populations (Quality Principles). They must conform to present professional understanding. (Professional Practitioner's Skill) and meet market users ' expectations (Buttell, P. et all 2008).

1.7 Organization of the study

The study consists of five chapters: background of the study, explanatory statement, study goals, research issues, research hypotheses, study significance, study scope and study cons traints. Chapter Two includes EHR literature, quality of care, theory of TAM and ethical review. **C**hapter Three contains information on research design and rationale, study role, participant choice, instrumentation, data collection, interview protocol testing, data analysis, research instruments validity and reliability and ethical factors. The fourth chapter will analyze, present and interpret the following themes; the use of EHR in the Legon Hospital, the behavioral intent to use EHR among staffs in Legon Hospital and the impact of EHR on quality of care among staffs and clients in Legon Hospital. Chapter Five contains the summary of the study findings, conclusions and recommendations, suggestions for further research and contributions to the body of knowledge.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

The study's theoretical and empirical literature is presented in this section. The section starts with EHR's overview and different definitions. The section continues with a lecture on digital health records history and advantages. Again, there is a presentation on the components and the challenges of electronic health records. The chapter also highlights healthcare quality and measurement. Next is the presentation on the model of new technology adoption at the firm. The chapter continues with an empirical review of EHR impacts on quality of care and the next is the chapter's summary.

2.1 Electronic Health Record System Overview

In the last 20 years, with the many changes in information technology, there has been discussion of different kinds of digital health documents (EHRs), created and enforced, particularly in healthcare. A national electronic health record is presently being planned by some institutions / countries, while others have effectively introduced some type of EHR (Zhang, R. et al 2010).

However, the type and scope of electronic health records vary, and what one country calls an EHR may not be the same as other countries. Though institutions / countries have carried out studies for patients on some sort of computerized healthcare data scheme, not many hospitals have effectively implemented clinical data-level electronic health records. (Grimson et al., 2000).

Although interest is usually high in both advanced and developing nations in automating health records

Unfortunately, the implementation of an EHR scheme appears to be overwhelming and al most out of reach for many health care suppliers and administrators as well as managers of medical records / health data. Why is this so? The barrier might not be only availability of technology, but expertise support and the amount involved in changing to an electronic system. These factors combine with insufficient health care funding. In fact, cost, affordable technology, lack of technical expertise, personal computing skills and the lack of data processing facilities in many developing nations are major issues that need to be addressed before implementation is viable.(WHO, 2006). Moving certain medical practitioners and health professionals in advanced and developing countries from manual to digital documentation can be an issue in relation to the above. Most health and data executives know that it may take time to chance or alter the attitude and conduct of health practitioners. (WHO, 2006)

2.1.1 Defining an Electronic Health Record

If people refer to what they have used as an electronic health record, they may not be the s ame as other electronic health records produced in various institutions / countries. That co uld be confusing. It can be a longitudinal record that is frequently available in many organi sations. In others, it can only be accessed within a restricted group or within a particular unit or department as a restricted automated system. Therefore, it is essential to understand what definitions are used and to determine the type and magnitude of the digital health record system of your institution / country.

A number of terms have been used over the years to describe the shift from a manual or pa per record to an electronically generated record in one form or another. Other renowned na

mes include: AHR, Electronic Medical (EMR) and Electronic Health Records (CPR). (WHO, 2006).

- **Automated Health Records (AHR)**

A collection of computer-stored pictures from traditional health records was described using the word Automated Health Records. This looked at issues with accessing, storing and controlling paper-based files but failed to fix patient input / output. (WHO, 2006).

- **Electronic Medical Record (EMR)**

As with Automated Health Records, the word Electronic Medical Record or EMR was used to define digital schemes based on imagery of documents or schemes set up in a medical practice or community health center. In many developed countries, these were commonly used by general practitioners, including patient identity data, medication, generation of prescriptions and outcomes of the laboratory. In some cases, during the visit of each patient, all the medical information provided by the doctor is included. The word EMR is used in some nations, such as Korea, to describe an electronic hospital recording scheme that involves clinical data entered at the point of care by the health care professional.

(WHO, 2006).

- **Computer-based Patient Record (CPR)**

Patient Record (CPR) based term was introduced in the 1990s in the USA. This was described as a compilation of the health data of a patient related to the identification of a patient. Over a long span of time, the CPR may contain as few as one episode of patient care or health care information (Amatayakul et al, 2005). Early CPR concentrated on responsibilities such as alerts, orders, offered integrated patient registration, admission and economic details. It also considered recording nurses, labs, and radiology and pharmacy

data. This kind of computer-based patient recording has been introduced in a multitude of environments, focusing on inpatient centers for exchanging data about health. (WHO, 2006)

- **Electronic Health Record (EHR)**

: In many nations, the term Electronic Health Record is widely used for definitions and coverage differences. It is usually recognized as a longitudinal health record in today's setting with entries from healthcare professionals at various locations where care is given. The present definition of an EHR in the United States;

The electronic health record includes all the information in a traditional health record, including the health profile, behavioral and environmental information of a patient. The EHR also includes the time dimension and the material that enables data to be included across distinct episodes and sellers, which eventually becomes a lifetime record. (Amatayakul et al, 2005).

Also frequently acknowledged as Electronic Medical Records (EMRs) are electronic health records (EHRs), and many people use the term interchangeably. (Eva et al, German, 2010). Electronic health records (EHRs), and many individuals use the word interchangeably, are also frequently recognized as Electronic Medical Records (EMRs). (Zhang, R. et al 2010). Only health professionals involved in the care of a patient can access and use an electronic health record (Zhang, R. et al 2010). A Personal Health Record (PHR) is a health record that a patient tracks and can alter (Zhang, R. et al 2010).EHRs are protected under the Health Insurance Portability and Accountability Act of the federal government. HIPAA); HIPAA does not cover PHRs (Zhang, R. et al 2010).

In a 2006 National Institute of Health research, the Health Information Management Systems Society (HIMSS) launched this official definition of an EHR:

The Electronic Health Record (EHR) is an electronic longitudinal record of patient health information produced in any care delivery environment by one or more interactions. Patient demographics, progress notes, issues, drugs, vital signs, past medical history, immunizations, laboratory data, and radiology records are included in this information. The EHR is automating and streamlining the workflow of the clinician. The EHR is capable of generating a full record of a clinical meeting with patients. It also encourages other care-related activities directly or indirectly via interface, including support for evidentiary decision-making, quality management and reporting of results. Doctors in their clinics, hospitals and other health facilities develop and use this EHR. (DesRoches et al 2013)

2.2 History of Electronic Health Records

Since the emergence of health care, medical documents have been around. The medical records were used in the early days to record the disease and its likely cause. (Schneeweiss et al, 2005).Medical documents were held on three by five cards in the early part of the 20th century (Seymour et el, 2012). The 1960s and 1970s saw a quickly evolving health care period when the federal government passed laws establishing Medicare (Seymour et el, 2012). At one moment many entities joined the healthcare industry, lawsuits began to arise, healthcare was vital; stricter industrial legislation was implemented by the state (Seymour et el, 2012). This is the time frame when there was a real need for medical records in health care and first there has been an electronic health record. (Ford, Huerta & Yu, Menachemi, 2010) Using digital records was slow with doctors and other care providers. It was estimated that less than 8% of households will have an EHR in 2009. (Ford, Huerta & Yu, Menachemi, 2010). The huge cost of schemes and the lack of national standards are some of the variables that contribute to the slow execution of EHRs. Health care suppliers also spend a lot of time

and money complying with government law and patient privacy regulations (Seymour et el, 2012).

A speaker at the Health Institutes in 2005 spoke about today's health care system: "We have a medical practice of the 21st century but a paperwork scheme of the 19th century." He also added, "Electronic medical records will be one of the excellent developments in medicine." (Seymour et el, 2012).

The 2009 American Recovery and Investment Act was enacted by Congress in 2009. The U.S. government promotes Electronic Health Records (EHR) to substitute paper-based systems in this act for all healthcare businesses. Healthcare systems implementing an EHR system efficiently will allow their facilities to obtain bonus incentives and penalize facilities not using EHR technology (Information Week, 2009). Under this law, if they become significant consumers of health information by 2014, Medicare and Medicaid will provide incentives for hospitals and physicians (AHA News, 2010). Because of the effectiveness of EHRs, many new medical facilities in developed countries start with an EHR implementation. However, in countries such as Ghana, the use of EHRs did not start until 2014. (Adjorlolo & Ellingsen, 2013). Most medical services are still using paper documents.

In 2012, a scientific report evaluated the data collection management of four hospitals in Ghana: Korle-Bu Teaching Hospital (KBTH), Effia Nkwanta Regional Hospital (ENRH), Komfo Anokye Teaching Hospital (KATH) and Tamale Teaching Hospital (TTH). The findings were that KATH was the only hospital to have an EHR in place while the remaining hospitals were either in the process of implementing one, or did not have one at all. User acceptance was low and maintaining data was difficult for the hospitals in transition. Those added to the challenges of transferring from a paper record system to a full EHR system (Achampong, 2012). Despite the difficulties, the increase in quality of patient care and efficiency within the medical environment made it worth implementing one.

2.3 The Benefits of an EHR System

There are countless advantages to a correctly implemented EHR. In November 2011, the Institute of Medicine revealed; "When properly designed and used, health IT is anticipated to assist improve health professionals ' efficiency, decrease operating / administrative expenses and improve patient security" Other advantages include enhanced efficiencies, enhanced precision of health documents and timely and accessible documents. (Kalra, 2006).

EHRs will also enhance the efficiency of health care. This is achieved by the healthcare provider's efficiencies that will reduce staffing rates and the cost of healthcare (Helton, Langabeer, DelliFraine, Hsu, 2012). EHRs enable re-engineering of clinical job procedures to make the job method more effective. The other aspect of healthcare cost saving is that EHRs nearly eliminate the need for medical transcriptions (Seymour et el, 2012).

By decreasing medical errors, EHRs enhance the quality of healthcare. In a 2008 research the Actuaries Society discovered that "measurable medical mistakes cost the U.S. $19.5 billion" (Kalra, 2006). EHRs can decrease medical mistakes and decrease general healthcare costs by improving the medical documentation and clinical decision support systems. E-prescribing will also assist to eliminate mistakes in medicines. The other major savings that EHRs will make are eliminating duplicate testing and patient testing (Connelly et al, 2011). Another benefit includes getting rid of enormous quantities of paper produced when paper papers are created and shared. (Seymour et el, 2012). EHRs will provide patients easy access to their data, assist them become more engaged in their healthcare. (Connelly et al, 2011).

2.4 Components of EHR

The typical Electronic Health Records system is an embedded, multi-part health data system. Tang (2003), observed that an efficient EHR scheme: should be capable of longitudinally storing patient health information and data; should be capable of correctly managing the outcomes produced from the scheme; should also facilitate electronic communication and connectivity ; provide assistance for patients and assist in administrative procedures and reporting. Nøhr (2006), also emphasizes EHR's prevalent elements as:

Clinical Documentation: EHR should enable healthcare professionals to better handle progress notes from their patients as either free text directly entered into the system or through already defined structured notes.

Booking service: An EHR scheme permits patients to make face-to-face or online bookings with their medical professions.

Communication / Messaging: EHR systems should also allow communication between different hospitals, general practitioners, pharmacies and laboratories to be exchanged.

Management of results: EHR systems also facilitate the testing of medical results. The system should be able to show some warnings for unusual results. The system should also portray a particular outcome's patterns.

Charge Capture / Billing: Due to the patient's health service, EHR makes it simpler to monitor spending owed to the facility.

Management of illness: EHR also allows chronic disease management by enabling health experts to access information to evaluate whether or not the disease has been managed

correctly. Security problems management: All EHR systems have unique characteristics to support user authentication and authorization handling.

2.5 Electronic Health Records System Challenges

There are still some difficulties that need to be resolved and overcome with all the advantages that EHRs bring to healthcare. An EHR's first challenge is the enormous expense for EHR systems (Connelly et al, 2011). EHR systems can range from $15 million to $30 million in big hospitals. Tiny hospitals aligned with a bigger ones help reduce cost incredibly. It also prevents high consumption of capital budget for an entire year. (Connelly et al, 2011).

The second challenge is that the EHR may result in enhanced clinical documentation time based on the selected EHR scheme. Some doctors and nurses will resist changing and returning to the old paper schemes. (Connelly et al, 2011). During the application of an EHR, failure to alter clinical procedures may destroy any efficacy that the investment hopes to achieve. Other difficulties facing the EHR scheme include slow processes owing to either the software or bad speed of networking. In addition, system collisions prevent all clinicians from performing their job. It is necessary to develop backup and redundancy schemes. Security of the EHR scheme is a major task to be resolved. As medical records are wealthy in private data, an enormous target for hackers could be electronic medical records. (Prairie, 2011). Theft of medical identity becomes a major problem and this problem will be perpetuated by the implementation of EHRs (Featherly, 2011). Stage one significant implementing guidelines include fourteen primary demands and five out of ten optional choices. The federal government has yet to publish phase two and phase three important guidelines for use. This poses enormous unknown danger to health care suppliers as failure

to satisfy the suitable requirements for use will lead in decreased payments for Medicare and Medicaid.

The last significant challenge for EHRs is the capacity to satisfy the meaningful use laws of the government. For meaningful use, the guidelines are crucial (Ford, Huerta, Menachemi, Yu, 2010). Stage one significant implementing guidelines include fourteen primary demands and five out of ten optional choices. The federal government has yet to publish phase two and phase three important guidelines for use. This poses huge unknown danger to health care suppliers as failure to fulfill the suitable utilization requirements will lead in decreased payments for Medicare and Medicaid. (Jarousse, 2010).

2.6 Quality of Care

We need a shared quality definition and comprehension of the strengths, weaknesses and misunderstandings of broad opinions on quality healthcare to start this debate. When asked what quality means for a group of healthcare professionals, the space may contain as many definitions as people. Depending on the constituent's view, Separate definitions can and will result in different priorities and goals: patients, their families, health care providers and professionals, regulators, insurers and employers. W. Edward Deming, who led the Japanese and U.S. quality revolution, said;

> "A product or service has quality if it helps someone and enjoys a good and sustainable market." It does not describe quality explicitly, but relates to the importance of a product or service, both in terms of its capacity to assist the consumer and its marketability. (Phil Buttell, 2007)

Donabedian, a leader in quality theory and healthcare management, has suggested previously "several formulations are both feasible and valid, based on where we are in the care scheme and on the nature and magnitude of our duties." Logically, various opinions

and quality definitions will involve separate approaches to measurement. Another author acknowledges the intrinsic quality definition issue by saying, "It would be hard to discover a realistic definition of quality that did not, implicitly within the definition, have a basic expression or implied concentrate on building and maintaining relationships." Understanding different quality views does not preclude the achievement of quality of care unless important quality of care has been achieved. (Phil Buttell, 2007)

In 1990, the Institute of Medicine (IOM) formulated the most durable and widely cited definition of healthcare quality. According to the IOM, quality is "the degree to which individual and population health facilities boost the probability of required health results and are compatible with present professional understanding." Other writers have acknowledged Deming's recognition of market significance. They refer to care that meets the expectations of healthcare facilities' nurses and other clients. Therefore, for the purposes of this debate, we extended the definition of the IOM. Quality is the level of health facilities' effort to enhance the likelihood of desired health outcomes for individuals and groups (Quality Principles), comply with current professional knowledge (Professional Practitioner Skills) and meet the expectations of healthcare customers on the market. (Phil Buttell, 2007).

The precision of medical diagnosis and processes is defined by technical quality. On the other hand of the range, functional quality portrays the facility's technique of service delivery. Within these two points of view, there are strong arguments that functional quality mainly explains the experiences of patients given that technical quality transcends the judgment of patients about their key fields (Asubonteng et al, 1996). The intrinsic complexity of critical assessment of technical quality and the overall absence of technical understanding by most customers seeking healthcare implies that service quality assessment was mostly based on characteristics such as empathy, reliability and responsiveness. (Babakus and Mangold, 1992; Wiesniewski and Wiesniewski, 2005). It is these attributes

that provide feedback and information on patient levels of satisfaction with quality and which are used to improve service delivery (Devebakan et al, 2005).

2.7 Components and measures of Quality Care

Three component strategy by Donabedian (2005) to assess the quality of care that supports the measurement of improvement. The phenomenon. The structure, process and results are the three elements. An extra element is the measurement. For measures of improvement – balancing. Donabedian believed that structural measures had an effect on process measures, which in turn influenced outcome measures. These together form the foundation for an efficient package of interventions that is required. The reality is that cause and effect, particularly within the NHS, are more complex, with so much variability in individual patients. Outcome, process, structure and balancing measures are really crucial for enhancement projects. It's not a choice either. In determining whether the enhancement project has had the required effect, each of the distinct kinds of interventions has a distinct objective.

2.7.1 Outcome measures

These represent the patient's effect and show the end outcome of your job on enhancement and whether it eventually accomplished the goal(s) set. Examples of outcome measures include decreased mortality, decreased stay length, decreased hospital-acquired infections, negative or damage events, decreased emergency admissions, and enhanced patient experience.

Process measures

These depict how your systems and processes deliver the necessary outcome. For instance, if a patient receives certain norms of care or not, where staff are washing their hands, recording occurrences and acting on outcomes and keeping patients informed of delays in waiting for an appointment, the duration of moment a patient is waiting for a senior clinical examination.

2.7.2 Structure measures

These represent the service / provider characteristics such as personnel to the service's patient ratios and working times. These are otherwise referred to as measures of input.

2.7.3 Balancing measures

These represent unintended and/or broader effects of either positive or negative change. It's about recognizing these and attempting to evaluate them and/or minimize their impact if necessary. Following measures to decrease the duration of stay, an instance of monitoring of emergency re-admission rates would be a balancing measure. According to Donabedian, healthcare effectiveness and quality measurements remain the ultimate validators, but they can sometimes be hard to define and have time lags. Process steps are essential in determining whether clinical care has been' correctly implemented' or whether we're doing what we say we should do. From an enhancement view, they create a significant link between behavioral modifications and results.

Measures for process and outcome are essential as they connect change theory to your anticipated results. If you only measure results, you can't be sure that the changes actually took place in practice, so you can't link up the improvements with the results. You can't be sure that the results have changed and the goals have been achieved if you only measure the

process, so there is a risk that the process will improve, but there are no results. In addition, enhancement initiatives should recognize unintended change effects known as balancing measures — often recognized by listening to skeptics and their issues (Donabedian, 2005).

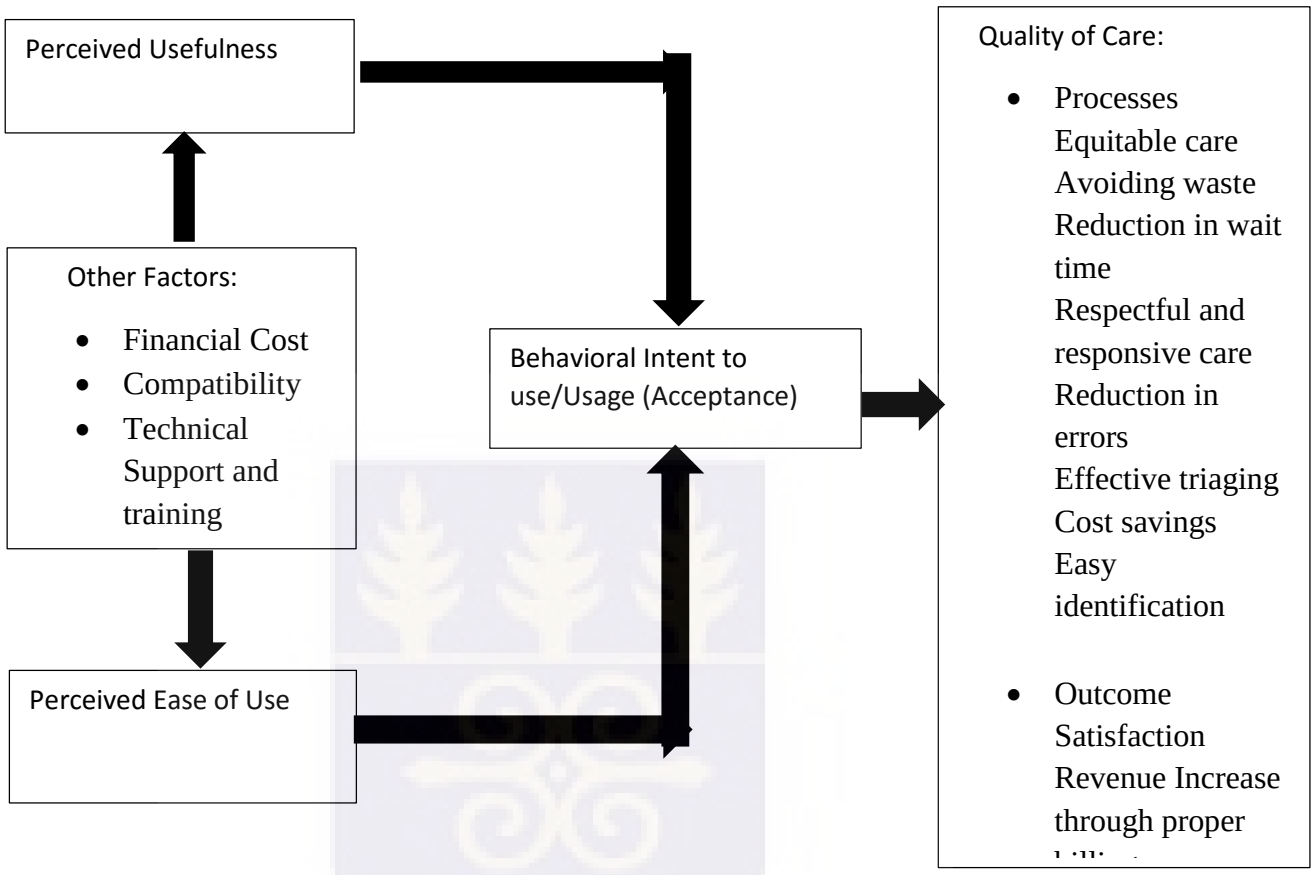
2.8 Theoretical Framework

2.8.1 Technology Acceptance Model (TAM)

In 1989, Fred D. Davis launched the Technology Acceptance Model in a research paper entitled "Perceived Usefulness, Perceived Ease of Use, and User Acceptance of IT." In his fundamental model, Davis begins with the premise that the real use of the technology, defined as "one particular conduct of concern conducted by people with respect to certain data technology scheme" (Holden & Karsh, 2010) is influenced directly by behavioral intent to use, which he also calls “acceptance”. Behavioral intent is defined as “an individual's motivation or willingness to exert effort to perform the targeted behavior”. (Holden & Karsh, 2010) Behavioral intent is used in the TAM, not real use. Attitude and perceived usefulness (PU) influence acceptance. Attitude is described as "the assessment of the target conduct by the individual on certain aspects (e.g. good / bad, harmful / beneficial, pleasant / unpleasant)." (Holden & Karsh, 2010) Attitude is affected by the two main TAM factors – perceived utility, defined as "an individual's perception that using an IT system will improve work efficiency" and perceived ease of use, described as "an individual's perception that using an IT system will be effortless." (Holden & Karsh, 2010) Perceived ease of use also affects perceived usefulness directly.

2.9 Conceptual Framework

Figure 2.1: conceptual Framework



Source: The Author's Construct (2019)

2.10 Other Factors

The capacity of the hospital to bear the financial cost and compatibility of the planned Electronic Health Records software with the service provided by Ghana University Hospital forced the hospital to go for the software. The hospital's capacity to have appropriate technical support for the software's assembly and operation also pushed the hospital to secure the software. Once hospital management was sure they would be able to train their employees to get up-to-date with the software procedure, they came into the software for Electronic Health Records.

2.10.1 Perceived Usefulness

Once the hospital had the economic muscle to buy the EHR software and the management realized that it would receive technical support while the software was deemed compatible with the services it provided, the software was regarded helpful.

2.10.2 Perceived Ease of Use

Ensuring technical support, training and EHR software compatibility with the planned services ensured its perceived ease of use.

2.10.3 Behavioral Intent to Use/Usage (Acceptance)

When the EHR software was considered to be helpful and there was a perception of ease with its use, the idea of going electronic when it came to record keeping was fully adopted by employees and management.

2.10.4 Quality of Care

The perceived utility and perceived ease of use resulted in increased behavioral intent to use the EHR in hospital at the University of Ghana. This was anticipated to affect the hospital's quality of care. The processes(equitable care, avoidance of waste, reduction in wait time, respectful and responsive care, reduction in errors, effective triaging, cost saving, easy identification etc) of healthcare delivery and health outcomes (satisfaction, increase in revenue due to proper billing etc) were used as indicators to measure the quality of care at Legon Hospital. They will be able to assess their achievement with these indices or otherwise with the introduction of Electronic Health Records.

2.11 Empirical Review on EHR impact on Quality of Care

Keyhani et al. (2008) performed a cross-sectional analysis using mixed information from the 2005 NAMCS and NHAMCS in a research on elements of digital health documents and quality of care. NAMCS gathers information on visits to physicians involved in direct patient care who are not employed by the federal government. NHAMCS gathers information on the provision of outpatient facilities in outpatient departments of non-federal hospitals. For both studies, qualified interviewees visit doctors ' offices or hospitals to examine and give physicians guidance on how to complete the forms. Both studies gathered comparable information on the features of doctors using EHRs in their offices in 2005. Data were gathered from 25,564 NAMCS visits and 29,975 NHAMCS visits between 2004 and 2005. The results were that Electronic physician notes (21.6%) were the most common and electronic reminders (12%) were the least common component of an EHR reported in visits to primary care provider and enhanced better care through effective hand over. In another research by Poon et al. (2010) on the use of electronic health record characteristics and the relationship between health care qualities, a mail study sent a $20 honorarium questionnaire to each of the 1884 physicians. Second and third mailings were produced as required and there were phone calls. The study included questions related to the responding physician's EHRs, organisation of practice and populations served and demographic features. The research also investigated the use of specific features of electronic health records, namely: laboratory test outcomes, radiology test, inspection, entry of laboratory orders, entry of radiology orders and electronic visit notes. The findings indicate that primary care physicians correlated the accessibility and use of particular EHR characteristics with improved performance on certain measures of quality. These findings indicate that EHR designers, implementers and certifiers should concentrate on enhancing the implementation of robust EHR schemes and improving the use of particular characteristics rather than

merely deploying an EHR regardless of functionality in order to maximize the quality of health care.

Similarly, Changes in Performance following Implementation of a Multifaceted Electronic-Health-Record-Based Quality Improvement by (Persell et al, 2011) using this survey in a large-scale scholarly internal medicine practice in Chicago, IL using a business HER. It included all patients eligible for one or more quality measures and sent all adult patients eligible for each measure (range roughly 100-7500). The effectiveness of 8 measures increased significantly in the year preceding the intervention. Performance significantly improved during the year following the intervention for 14 projects. For 9 measures, the primary outcome increased quicker during the intervention year than during the previous year. Implementation of a multi-faceted QI intervention using EHR tools to improve quality measurement and clinician feedback accuracy and timeliness improved performance and/or simultaneously accelerated the rate of improvement for different interventions. Data from Arkansas, California, Florida, Massachusetts, Mississippi and New York State Impatient Database (SID), Healthcare Cost and Utilization Project (HCUP), Healthcare Research and Quality Agency were used in a comparable research (Yanamadala et al. 2016) SID is an all-capture state database that connects patient overtime and includes data about a patient's features, main and secondary diagnosis, and processes. The SID database was connected to the 2011 American Hospital Association (AHA) annual study database containing data on the use of HER in different hospitals and other significant characteristics of the hospital. The findings were that hospital-treated patients with complete EHR had a reduced mortality rate (3.7%) than patients with partial EHR (4.0%) or no EHR (4.4%) treated in hospital. Medical patients treated in hospitals with complete EHR did not have a distinct statistically important readmission frequency (19.4%) compared to patients treated with partial EHR (19.6%) or no HER (20.3%).

2.12 Conclusion

Several aspects of digital health records have been researched and many elements of literature are abundant. However, literature on the health care quality effect of electronic health records appears to be uncommon. For this purpose, this study will add to the inventory of electronic health records data.

CHAPTER THREE

METHODOLOGY

3.0 Introduction

The Chapter mentions the procedure by which the work was conducted. It comprises of the research paradigm which explains the worldview of philosophical issues underpinning Electronic Health Records and Quality of Care. The approach to the study also explains the method that was used to carry out the study, hence the qualitative research approach. The research design, sources of data, sampling technique, sampling size, the target population, data collection instruments, the key constraints to this study as well as the ethical consideration are all part of this Chapter.

3.1 Profile of Case Study Organisation

Built and commissioned in 1957, the Ghana University Hospital, commonly referred to as Legon Hospital, is officially owned by Ghana University. Five (5) doctoral staff and four nurses migrated to work at the University College Hospital from Achimota in 1959. The hospital's facilities have increased over time to include the Maternity Ward and Staff Quarters. The hospital is currently located 12.6 kilometers from Accra–Aburi stretch, behind Legon Police Station in a readily accessible area. It is a 130 bed quasi-government hospital. It has General Wards, Maternity section, Casualty and Emergency section, Pediatric Unit, Dental Unit and Operating Theatre. It was created to meet the student population, employees and their dependents ' health needs. As the community began to develop in 1976/77, the residents of its rapidly increasing surroundings began to seek hospital health care. The Ministry of Health (MOH) easily recognizes the shift in duties of the University Hospital in

1976/77 and agreed to provide drugs, supplies equipment and instruments to the hospital on an annual basis.

This scheme worked quite well until the introduction of the "cash-and-carry" scheme in 1986/87 and the hospital aid ceased. The Hospital readily supplied these people with their services as there was no other hospital in the entire Legon region. The hospital has, over time, been perceived as a District Hospital and has a wide catchment area.

It has a program to educate and advise students, expectant mothers, lactating mothers, and the public on hygiene, healthy nutrition, immunization against communicable diseases, family planning etc.

3.2 Research Paradigm

Researchers are driven by different convictions and values that explain why they use certain models and methods. Scholars call these beliefs and values paradigms (Kuhn, 1970; Guba, 1990). A paradigm or worldview is a basic set of beliefs that guide actions (Guba, 1990). These sets of values are based on certain foundations of philosophy. Positivism, interpretative and critical realism are the various paradigms of knowledge that underpin research. (Baroudi & Orlikowski, 1991; Myers & Avison, 2002). This research used the paradigm of interpretation because it is based on the premise that truth is subjective and understanding is formed by creating sense out of the different meanings individuals attach to reality. (Klein & Myers, 1996). Due to his capacity to help the investigator study the impact of electronic health records on quality of care, this paradigm was chosen.

3.3 Research Approach

For this study, the qualitative research method has been used. According to Patton (2012), the Qualitative Research Approach is an attempt to recognize circumstances in their uniqueness as part of a specific context and relationships. The qualitative research method was selected because it provides a chance for the investigator to find meanings that individuals attribute to the occurrence of quality care documents in electronic health. (Neuman, 2014; Denzin & Lincoln, 2011; Boateng, 2015). Therefore, the study considered it appropriate to use this research strategy to study the extent to which electronic health records have an effect on the quality of care. This strategy also helped the investigator comprehend the complicated problems underlying the under-study phenomenon.

3.4 Research Design

For this study, the case study research design has been adopted. Case surveys are an investigative approach in which the investigator investigates a program, event, activity, process or one or more people in depth. (Creswell, 2009). Baskarada (2014) describes a case study as an empirical investigation that explores a phenomenon in depth and in its real-life context, particularly when the limits between phenomenon and context are not evident. The case study was regarded because it highlights the depth that is crucial to my study as the investigator attempted to determine the impact of electronic health records on quality of care. (Rose, Spinks & Canhoto, 2015). The case study enabled the University of Ghana Hospital to thoroughly research the phenomenon of impact of electronic health records on quality of care. It helps to clarify real-life situations complexities. The case study was used as it enabled different data sources (observations, interviews and documents) to be used to request data on the effect on quality of care of electronic health records. Apart from these benefits, the case study was criticized for absence of rigor and also lacks the authority of

generalization (Creswell, 2009). Being conscious of the weakness of the generalisation of case studies, the research findings were specific to the context of the individuals being studied. Again, "various truths and the natural environments" of participants are critical to the qualitative strategy (Denzin & Lincoln, 2011; Lincoln & Guba, 1994) Case study allowed the investigator to obtain different subjective opinions from employees and clients benefiting from electronic health records at the University of Ghana hospital. The organisation that served as the case for the studies was the University of Ghana Hospital. It's located in the Greater Accra region. Consequently, it is not out of place to find out about the impact of electronic health records on care provided to them from staff and clients.

3.5 Study Population

The research population includes the University of Ghana Hospital employees and management working in departments operating with electronic health records. It also consists of hospital-accessing customers. To be included in this research, respondents in a department using EHR for service delivery in Legon Hospital must have been health care providers. The participant will be needed to have hospital experience and provide direct Electronic Health Care and/or quality assurance / improvement team member of the hospital. The population for this research included one physician, one record officer / health data officer, one laboratory technician, one key management member, one pharmacist and a nurse using EHR and five customers accessing EHR care for service delivery in a department. The chosen people should have quality healthcare and Electronic Health Record experience and are prepared to discuss their perceptions of the EHR system's usefulness and impact.

3.6 Sample Size

This is the audience a scientist intends to seek their opinions on a specific topic under inquiry. The study's sample size was 11. Polkinghorne (1989) suggests that a sample size of 5 to 25 respondents is adequate to collect wealthy phenomenon descriptions. Researchers differently categorize the sample sizes according to the sort of research. A small sample size is promoted by qualitative studies (Miles & Huberman, 1994) Due to the complexities in larger sample size, it may be hard for the researcher to acknowledge evolving data. Selection of sample size differs. In a research, a bigger sample size may provide more scope; however, smaller samples are more appropriate for scientists looking for details. It begins tiny or large, and the sample size may require the investigator to modify the saturation rate. (Patton, 2002). Creswell (2013) and Polkinghorne (1989) noted that in order to acquire thick, rich data, the choice of participants in a homogeneous group may result in a quicker saturation point. The participants were health care providers who made up both the homogeneous group and clients in this studies.

Table 3.1: Summary of Respondents

Participants	Number
Physician	1
Nurse	1
Pharmacist	1
Laboratory Manager	1
Records Manager	1
Management Member	1
Clients	5

3.7 Sampling Technique

A purposeful sampling approach is a non-probability sample chosen based on demographic features, study objective, enabling the researcher to examine significant characteristics by linking research questions to norms (Huberman & Miles, 1994). The purposive sampling technique was also used to select the respondents. This is because they are deemed to be knowledgeable about the use of electronic health records project and its impact on quality of care (Boateng, 2015).

3.8 Data Collection Instruments

For this studies, the information gathering method includes interviews, review and observation of journal notes. (Creswell, 2013). There have been one-one interviews with problems related to open-ended research. When used by previous occurrences to evaluate behaviors, qualitative interviews are helpful. By prompting the ideas of the participant, it enables the investigator to comprehend behaviors and views. The interview is based on the exchange of prior experiences with the participant about the researcher's results (Maxwell, 2013). The questions were created by assessing the literature in order to obtain a clearer knowledge of the issues. The issues of the research were created using the theory of TAM. In order to convey their feelings and thoughts, data were collected through semi-structured interviews with selected participants. Previous studies concentrated on suppliers' perceptions of EHRs to get answers (Mair & Bouamrane, 2013). The issues for the interview included 10 open-ended client issues and 7 comprehensive reactions from employees (see Appendix A and B). Observation can be helpful field data to support the paper of the scientist. Observation of the participant offers a distinct fieldwork approach.

3.9 Sources of Data

Both main and secondary data were used in the studies. Data were acquired from primary sources from field observation, interviews with project implementers using an interview guide. The secondary data sources were essentially an empirical review.

3.10 Validity and reliability of research instrument

The standards of evaluating qualitative research vary across methodology experts (Creswell, 2013; Miles & Huberman, 1994). Assuring confidence in qualitative research needs scientists to show the reliability and validity of the results of the study (Miles & Huberman, 1994; Patton, 2014). In order to evaluate qualitative research, Creswell (2013) refers to validation as a method to convey accurate findings through established validation strategies. Validation strategies include: (a) prolonged commitment and persistent observation ; (b) peer review or debriefing ; (c) negative case analysis ; (d) clarification of research bias ; (e) member checking ; (f) rich, thick description ; and (g) external audits (Creswell, 2013). Lincoln and Guba (1985) coined four requirements: credibility, transferability, confirmability, and reliability. The traditional approach of Lincoln and Guba (1985) was used for the reasons of the study; however, the validation approaches were interwoven within the four quality criteria to address research quality (Creswell, 2013).

The investigator should recognize any opportunities or biases that may add to the study's interpretations and conclusions (Creswell, 2013). Reflexivity and triangulation enable people to conform by demonstrating that the respondents ' outcomes are exhaustive rather than the researcher's biases. (Huberman & Miles, 1994). I incorporated my personal experiences working with EHR and my previous interactions with the respondents to tackle the inevitable bias in order to better interpret the study findings.

Data analysis triangulation enhances credibility (Creswell, 2013; Patton, 2014). Interviews can assist the investigator collect the view and observation of the participant to evaluate verbal behaviour, gestures and indications that follow throughout the research to enhance credibility. (Lincoln & Guba, 1985; Patton, 2014). The informal interactions with the administrators and other staff provided insight to capture a better understanding of the current work environment (Patton, 2002).

Interviews were registered to capture the information as respondents answer questions about interviews for precise documentation of their statements to improve reliability. To ensure quality, reliability, and credibility, each study participant reviewed their responses. The participation of the participant ensured that the data the investigator gathered and understood reflected the expected answers (Patton, 2002; Creswell, 2013).

Transferability improves external validity relative to quantitative research by generalizing and implementing the results in one study to other environments, moments and people. To create transferability and consistency throughout the research, the research will include dense and comprehensive descriptions of the information. Detailed descriptions of the research can assist to increase readers ' possibilities to recreate the study context to other environments (Creswell, 2013; Maxwell, 2013).

3.11 Data Analysis

The data that was obtained through the in-depth interviews were recorded using a voice recorder. The interviews recorded were played a number of times and listened to establish first-hand issues presented by the respondents. This was followed by a careful transcription of the audio recordings. To ensure the accuracy and quality of the information transcribed, the audio of the voice recording was played three times while reading through the

transcribed script. This procedure was preceded by a content analysis and interpretation of the information transcribed. Themes were now raised based on the segmented data for easy analysis. The field notes that were gathered during the interviews were also used to support the results presented by the respondents. The final results of the study were now presented in themes.

3.12 Ethical Considerations

Research needs ethical processes to be integrated throughout the research. Whenever there are ethical concern or concerns, it is important to address them (Maxwell, 2013). While the research did not intend to impose any future ethical problems, the research needed permission through Ghana University (Legon). University of Ghana (Legon) approved the research. Potential research participants were given informed permission before they became engaged in the study to clarify the objective of the study. While there was no instant danger, questions from the interview asked about experiences working with an EHR. At any time, the participants had the option to withdraw from the study. Participants were informed that their identities would be protected after data collection of non-identifying information kept in the confidential coding and interview protocol forms. To ensure confidentiality, the information gathered without participants ' coded names and workplaces was stored on an external hard drive. All paper information retained throughout the investigation will be stored for a period of 5 years on the external drive. In order to protect the data, the external drive containing the files stayed under my oversight. The drive with the information will be deleted at the end of five years. The interview transcripts are on the internal drive and the paper copies were destroyed after the dissertation was submitted.

3.13 Limitation of the Study

The following limitations influenced the findings of the study;

First, the study was to concentrate on staffs using EHR at Legon Hospital only. The findings therefore may not be generalized to the other healthcare staff working in the same hospital. Secondly, the hospital had other departments not using EHR. Since the hospital operates like a system, the chances of staff in those departments had in some way, contributed to the effectiveness of the use EHR in improving quality care. Also, the study also concentrated more on structural, process and outcome factors impacting quality of care. Staff factors like negative attitudes were not investigated. However, future researchers are encouraged to do further research in these areas.

In addition, some respondents feared a confidentiality breach as some respondents felt reluctant to give some information to the researcher or felt apprehensive about the intention of the study. Those would have affected interview data consistency and accuracy. However, that challenge was addressed by assuring the respondents that their identities would remain confidential and also explained to them that the intention of the study is for scholarly purposes only.

3.14 Summary

The chapter included the phenomenological methodology used in the research to investigate government health providers ' perceptions and comprehend EHR's impact in quality care. This chapter also included participant selection, data collection techniques, interviews and observation and information analysis schedule of the study. Chapter 4 will contain the results of the study. The information gathered in the field setting, data analysis and outcomes will be further explained in this section.

CHAPTER FOUR

DATA ANALYSIS AND DISCUSSION

4.0 Introduction

The chapter presents the data collected through analysis based on the objectives. The analysis begins with background to the analysis as well as data screening, frequencies and percentages of the profile of respondents. It also includes thematic analyses of the various variables of the study. The second part of this section deals with the discussion of the findings.

4.1 Background to the Data analysis

The data was collected by the use of semi-structured interview guide based on the sample size (11) proposed in the research methodology. The 11 respondents (management & patients) were interviewed from the University Hospital, Legon. The respondents found it interesting in responding to the questions because the questions were about their personal experience at their present post. After the data had been collected, it was transcribed and coded by the researcher. The demographic data was presented in the form of tables indicating the coded names for each respondent. After reading through the scripts, codes were generated. The salient themes running through the transcribed scripts were identified and discussed using appropriate quotations from the respondents.

4.2 Demographic Analysis

The demographic profile of respondents was presented in terms of their: gender, positions and work experience.

4.2.1 Position and Work Experience of Respondents

The position and work experience of respondents were key factors in this study because, the hospitals in Ghana are characterized by varied job positions as well as varying work experience in terms of number of years and most of which are burdened with responsibilities.

Table 4.1: Summary of Respondents' Work Positions, Work Experience and Gender

Respondent	Title/Position	Work Experience	Gender
Respondent M1	Accounts/EHR Manager	2 years	Male
Respondent M2	Midwife	7 years	Female
Respondent M3	Doctor (SHO)	3 years	Male
Respondent M4	Pharmacist	1 years	Male
Respondent M5	Head of Records	10 years	Male
Respondent M6	Asst. Head Laboratory	2 years	Male
Respondent P1	Nurse	3 years	Female
Respondent P2	Trader	2 years	Female
Respondent P3	Lecturer	4 years	Male
Respondent P4	Accounts Officer	3 years	Male
Respondent P5	Student	3rd year	Female

Source: Fieldwork 2019

As shown in Table 4.1, the various positions of respondents were accountant/EHR Manager, midwife, Doctor, Pharmacist, Head of Records, Asst. Head Laboratory, Nurse, Trader, Lecturer and Student. Respondents had varied working experience in terms of years, ranging from 1 year working experience to 10 years working experience. This exemplified that respondents were engaged in viable work positions at the various departments in the Hospital to appreciate and express the experience about the subject matter of the study.

4.3 Preliminary Data Analysis

Thematic analysis was employed in this part. The interviews were recorded, upon approval from the interviewees and transcribed verbatim. Through the triangulation method the information were validated and verified for accuracy. Triangulation is performed by

comparing various sources of data on a specific issue to find common themes (Creswell, 2013; Patton, 2014). Therefore, it allowed for comparison of information from the two categories (management & patients) on the same variables of the study. The triangulation in this study indicated that responses from the two levels of respondents were not far apart, thus they were similar to a large extent. After the interviews were transcribed, codes and themes were generated. The transcribed interviews and the generated themes were cross-checked with some fellow and senior colleagues. Therefore, the generated themes from the responses were checked to see if they fit the responses under each category. Suggestions pertaining to some of the themes were given by those colleagues which led to the fusion of some of the generated themes. Codes were generated from the transcribed interviews; themes were searched, reviewed and named. Thus, for each question, the common themes that run through the responses from the interviewees were noted and defined. Furthermore, supporting statements or quotes from the interviewees were used in buttressing the identified themes.

4.4 Thematic Data Analysis based on Objectives

Once the interviews were transcribed, re-examined and validated from the interviewees, the statements that shed more light were highlighted. From these highlighted statements, common ideas or themes were searched, identified and reviewed. Therefore, if a theme is common in the responses of more than half of the respondents for each category of findings, these topics have been highlighted and evaluated. Subsequently the topics have been identified and named. The interviews were reviewed several times until there were saturations of themes, such that no new theme could be generated under each category apart from the ones defined. The categories that were based on the findings from this qualitative analysis are thus presented under each of the objectives to enhance understanding.

4.4.1 Electronic Health Record System in the Legon Hospital

The management participants in the study were asked if they used EHR in their departments partly or fully and whether they intended to continue the use of EHR or not. The managerial level analysis show that the EHR system is largely used in all departments in the Hospital, with the records being fully kept using EHR and almost all participants in the interview acknowledged that they would want to continue using the EHR. Therefore one theme that emerged was the full adoption and use of the EHR.

- **Full Adoption and use of EHR**

From the two levels of analysis, thus the managerial level and the patient level, the findings noted a full adoption and use of the EHR system. The results noted that most managerial participants see the hospital as fully using the EHR, with some of the respondents testifying that:

> *...everything is electronic but when there is a problem, we go manual within a short time, rectify the issue and go back to the EHR (Respondent M1, refer to Table 4.1).*
>
> *...Well depending on the power situation, we might switch to the manual but most often it is electronic (Respondent M5).*

On the part of the patients, majority of them affirm that the use of the EHR improves their personal healthcare. From the analysis, respondents registered that healthcare in the Hospital has improved with the computerized based system than the time they were going manual. Although, there were little challenges with the EHR but it was still better than the manual system. Below are examples from some respondents:

> *Care has improved because things are faster now except when the old doctors are behind the computer but when the young ones are behind the computer they are better and they make the system move faster. But when they were using manual, you find a lot of queues at records before your name will be mentioned to go and see the doctors (Respondent P4).*

It has improved my care because I do not carry my folder around all time, because every department is networked, they communicate with one another. I just went for an X'ray, they did not print anything and sent my records to the doctor that I am waiting to go and see. But sometimes it is slow because they have to type your diagnosis and everything in the system. I think it comes with little delays, still the electronic is better than the manual (Respondent P3).

4.4.2 Behavioral Intent to Use Electronic Health Record

The behavioural intent of management and patients to use the HER were discussed with the interviewees. The results revealed key themes emerging from the responses, such as continuity of the EHR, positive feedback from patients and mixed feeling about the programme

- **Management intent to continue using the EHR**

From the analysis, the management of the hospital registered their full intent to continue using the programme (EHR). Most of the respondents asserted strongly that the system benefited the hospital more than it demerits and therefore they would want to continue to use it in their daily operations. Some respondent reiterated that:

..Definitely, because when you weigh the merits and demerits, the merits far outweighs the demerits (Respondent M6).

Yes, it is a good program for every health institution to have and has really helped to reduce cost and time wasting (Respondent M3).

- **Positive Feedback from Patients**

On the part of the patients, most of the respondents acknowledged that they felt better and respected when receiving healthcare under the new EHR system.

Yes of course, I feel respected now than before when they were using manual because we don't fight over who is in front or behind me in a queue, you wait and your name is mentioned (Respondent 4).

Yes you are, because when you go to the records and you do not know anything, they will enlighten you and show where you should move to from there. When you go to triaging is the same. But whether you are respected or not is mostly dependent on the nurse or the doctor you meet but not necessarily on whether manual or electronic (Respondent 2).

- **Mixed Feeling about EHR**

Some respondents responded with mixed feeling about their waiting period at the hospital as a result of the use of the HER. Some were of the view that the waiting time was still the same though the implementation of the EHR. They noted that the difference between the manual system and the EHR system was just at the folder collection point but every other thing still remained the same, thus waiting for hours to be attended to.

> *…The waiting time is still the same whether electronic or manual you still delay. They sometimes tell you to go and come another day after you have waited for long (Respondent 5).*
>
> *Waiting time is reduced under the implementation of EHR but not in every aspect. At lab you wait longer and when there are a lot of patients too you delay but in general, waiting time has improved as compare to the manual time. Again, with the electronic, when you are going to see a general practitioner it's faster in terms of waiting time but when waiting to see a consultant it's still long (Respondent 1).*

4.4.3 Electronic Health Record and Quality of Healthcare

The electronic Health Record system to a very large extent affects the quality of healthcare delivery in the University Hospital. The analysis categorized this section into the benefits of the HER and the impact of the HER based on the interview questions.

4.4.3.1 Benefits of Electronic Health Records

The key themes emanated from the analysis indicated that management benefit a lot form the EHR system through that quality of patients' records, attending to patients simultaneously, quality requisitions, faster and easier booking of appointment among others. The results exemplified that through the use of EHR, all patients' information is vividly written for every caregiver to peruse in the process. Particularly, healthcare delivery to patients in the Hospital such as prescription and dispensing of drugs at the pharmacy are

opened for caregivers to access easily using the HER system. The process is transparent enabling access to whatever has been written concerning the patient at various points by the caregivers. The EHR system also helps in records keeping on the number of deliveries, eliminating the errors in recording and facilitating continuity of healthcare delivery. It provides easy access to patients' information. The following were among the benefits derived from the use of the EHR system at the University of Ghana Hospital.

- **Quality of patients' Records**

From the analysis, the results indicate that the EHR system helps in records keeping on the number of deliveries and strengthens the quality of receiving and keeping patients' medical records. One of the respondents indicated that:

> *Initially there were a lot of missing folders and was leading to multiple folders for one patient. Once a patient folder is missing, the medical records of the patients are also lost. When a new folder is made, then later the missing one is found leading to a multiple folders for one patient. Therefore merging the folders became a problem and costing the hospital more money because they needed to buy more folders. EHR has come to reduce the cost of buying folders and missing of folders are now a thing of the past. It has also increased the speed at which the records department attends to patients because when they were using the manual, one patient's folder could take about two-three hours to look for (Respondent M1).*

- **Attending to Patients Simultaneously**

Another theme that emerged in the process of using EHR in healthcare delivery is the ability of healthcare givers to attend to patients simultaneously. Healthcare givers have the full access to the medical information of patients and can therefore provide medical services in collaboration. One of the respondents exemplified that:

> *Doctors can now see patients simultaneously, meaning if one doctor has already seen a patient, it's a matter of calling him, and both will log in and check the patient's records, share ideas and take care of the patient. This was not possible when papers were being used. Some of the doctors can sit in their homes and know what is going on, on the ward with the patient and prescribe treatment and medication for the patient (Respondent M3).*

- **Quality Requisitions**

The results showed that the EHR improves quality of requisition. By using the EHR, the process of acquisition is easier, faster and convenient in getting drugs. The EHR system also allows for a backup of the data or information, making it more appropriate to use in healthcare delivery. The following examples show how the EHR system enhances healthcare delivery.

> *Using the manual, requisitions were being lost because things were written in a book and when the book is lost that's all. But now every requisition is in the system. It is easier to find them. There is also a backup. It makes it easier to get the drugs, organize them and dispense to the patients. It has cut down the time wasting with the patients because when we were using the manual we needed to go through the folders one after the other to see the prescriptions which were so cumbersome .With the EHR patients are assign MR numbers and as soon as the prescription is done, it is seen at the pharmacy, patients come and we easily and quickly serve them (Respondent M4).*
>
> *This saves time as compared to the manual system. It also makes requisition from the various clinics connected to the main pharmacy at Legon Hospital easier as everywhere is networked onto the system. This make the drugs requested from one clinic to be seen and delivered quickly unlike the manual system where people were moving from the clinics to the main pharmacy to make requisitions before drugs are supplied. There were a lot of moving around with this. With the EHR, patients' information are kept all the time without losing those (Respondents M2).*

- **Booking** A**ppointment**

In the perspective of the participants, appointment reservation difficulties were likely to decrease as a consequence of the hospital execution of the EHR. The following examples buttresses the assertion that the EHR system enhances faster appointment booking.

> *With the EHR, appointment booking is easier, when they look into the system. The hospital can even call a patient to remind him or her and say for example, in two weeks' time your appointment will be due, and this was not possible under the manual era (Respodent P1).*
>
> *….It depends on the sickness and the specialist a patient is assigned but when your sickness demands that you book appointment you can, under the EHR, but when they were using manual it was difficult to book appointment… (Respondent P2)*

4.5.3.2 Impact of Electronic Health Records System

From management perspective, the impact of the EHR on quality delivery of healthcare can be viewed as being negative or positive based on the following. The analysis revealed that in using the EHR, there is no discrimination, avoidance of waste, reduction in time and harmful delays, respectful and responsive healthcare, no harm cause to patients with the use of EHR or Manual and other healthcare outcomes.

- **Not Discrimination in Using the EHR**

Through the use of the EHR, the provision of healthcare does not vary in quality because of personal characteristics such as gender, ethnicity, geographic location and socioeconomic status. Thus making the EHR system a non-discriminatory. There is no discrimination because patient is given medical record (MR) number which must be entered before a patient's information pop up to be served. This does not discriminate unlike the manual era where staff at the pharmacy can favour others base on the characteristics mentioned. One of the respondent reacted as follows:

> *…Yes to some extent. There is no discrimination; it is based on first-come-first-served. But under the manual regime, there were favoritism, people were picking their friends folder, hid them somewhere for them to be attended to first anytime they came to the hospital. It is not possible now (Respondent M5).*
>
> *Now there is equal care for clients because of the computerization which operates on first-come first-served basis. During the manual era, senior members were given preferential treatment (Respondent 1M).*

- **Avoidance of waste, in the EHR**

The results revealed that the EHR system helps avoidance of waste, including waste of equipment, supplies, ideas, and energy. One respondent noted that:

> *EHR has reduced cost and reduced the use of papers as compare to the manual era (Respondent M2).*

- **Reduction in Time and Harmful Delays**

The findings revealed that there is reduction in time wasting and sometimes harmful delays for both those who receive and those who give care. The results noted that waiting time was reduced as compared to the manual era but it depended much on the doctor in the consulting room. It does not much depend whether manual or electronic. The results observed that the EHR system experiences occasional network issues which delays patients but in general and the inability of some healthcare givers to use the EHR system. The following examples helped confirm the analysis in this theme.

> *The desired results of the EHR are not fully achieved in terms of reducing waiting time but as compared to the manual era, waiting time has reduced drastically. The number of hours one spends at the records, cash office and triage has reduced as compared to the manual era. In the consulting rooms, waiting time has not much reduced but it has seen some improvement because a lot depends on the efficiency of the medical officer to use the system. Unlike the time that they were writing, they were faster now. The new doctors are now conversant with the use of the system (Respondent, 6).*

> *With EHR, patients waiting time has reduced, unlike when we were using the folders when one needs to flip through them before drugs were dispensed. The issue with the EHR is sometimes power outages and the network cause delays but I still think the waiting time with the EHR is reduced. However, whether or not there will be a delay also depends on the number of pharmacists available. If they are not enough to serve the patients, it also causes delay (Respondent 3).*

- **Respectful and Responsive Healthcare**

The findings revealed that the EHR system enhances the provision of healthcare that is respectful of and responsive to individual patient preferences and ensuring that patient values guide all clinical decisions. The analysis showed that patients feel very much

respected now because patients' information do not get out for others to see. The examples below confirm this assertion from the analysis.

> *To some extent, now patients can call and book an appointment. That was not available under the manual system. For the manual, patients needed to come to the hospital from wherever they were. Sometimes wait from morning to 2:00 o'clock because most of the clinic starts at that time. EHR has improved that with the appointment system but has not fully customized service to meet certain specific needs of the patients (Respondent M1).*

> *With both EHR and manual, patients are respected. Regarding responsiveness, when particular drugs are not delivered to patients, a sheet is given to them to indicate that. When the drugs are ready and the patients come, we readily serve them. They can sometimes call for us to check whether or not the drugs are in because every detail is in the system unlike the manual (Respondent M6).*

- **No Harm from EHR or Manual**

Another strong theme that emerged from the EHR system was the avoidance of harm to patients from the healthcare that is intended to help them. The analysis noted that no harm is caused to patients in any of the system, whether manual or electronic. It depends on proper identification of specimen. If the patients are well identified by using their age and name, there will not be mixed up to cause harm but if not, harm could be caused. The following examples help explain the notion that no harm is caused from the use of whether the EHR or manual.

> *…both manual and electronic system do not caused any harm to the patient because that has to do with the clinical not the system. When a patient get to the surgical or operation's ward, there are lots of protocols to follow; all the needed instruments are checked electronically before operations begins so no harm is caused. The protocols with EHR are tighter to cause harm than in the manual era (Respondent 2).*

> *They try as much as possible to avoid harm to patients with both electronic and manual. This is because there is always a pharmacist available to check errors in prescription. But the electronic system makes it easier to detect and rectify errors than the manual where an error is detected, one needs to go through a lot of folders to correct those (Respondent 4)*

- **Healthcare Outcomes**

The analysis revealed that the system came to mimic the manual system and has improved upon the processes of giving quality healthcare. The image of the hospital has gone up with the introduction of EHR and that has caused an increment in the number of patients trooping in to access care. EHR has come to correct a lot of mistakes. Healthcare outcomes are better with EHR than the manual. Successes in a number of caesarian sessions and increase in deliveries are frequently recorded**.**

> *The electronic has helped to enhance the services at the pharmacy. Every patient's records are kept confidentially, only the doctors and probably the pharmacist get to see and work with those records .With the folder system, others were seeing the patient's records. Even some of the patients were looking at their own medical records and were getting depressed for seeing their own condition. Others were running away from treatment having seen their records and others went to the extent of killing themselves. The electronic system has helped to protect the patients' information than the manual era (Respondent 6).*

From the perspective of the patients, the impact of the EHR system is evident in triaging, end user satisfaction of the system, relative cost of using EHR and other relevant services in connection with the use of the EHR.

- **Triaging**

The result shows that triaging is not made better under EHR than the manual. The respondents (patients) revealed that the EHR records have affected triaging negatively as compare to the manual system where they went with their folders and were attended to. With the EHR they go and the nurses tell them their information are not showing. One can go back and forth from the records to the triage and they will be told the information is not showing.

> *EHR has caused delays at the triaging because when the network go down you need to wait for a long time before it comes. But with the manual, they write everything down so it was faster, you did not have to waste too much*

time. I think triaging has not change, it is still the same. Under electronic or manual is still the same waits and services (Respondent P3).

- **End user satisfaction of EHR**

The analysis indicates that the use of EHR makes the processes faster now as compare to the manual system that caused a lot of delays. The EHR system gives much satisfaction because the information will not get lost compared to the manual.

Yes, to some extent when you compare with the time that they were not using EHR. The electronic system gives much satisfaction because your information will not get lost compared to the manual, the only problem with the EHR is the network problem. The satisfaction level is the same with both manual and electronic because the services have not changed. It is just the records keeping and transmission that has changed (Respondent P5).

- **Cost of using EHR**

The analysis revealed that the cost of operation is the same whether the EHR or manual systems. One respondent related that:

I think is the same services they are rendering so with or without electronic health records, the charge is the same (Respondent P2).

- **Other services of the EHR**

The analysis also revealed the other relevant services of the EHR system that patients benefit from. These services included follow up calls, social interaction and relational care from the nurses. Examples from the respondents are:

Yes as I said earlier I was once at home and the records people called and told me that my appointment time was due on such day. It was a delight to me. This was not done during the manual era (Respondent P3).

The fast pace at which they work after delivery of a baby and the things that they put the baby in is impressive than the manual time (Respondent P1).

4.5 Challenges of the Electronic Health Record at EHR

The findings revealed strong themes regarding the challenges of the EHR by both management and patients. The analysis showed some challenges of the system as procurement of the hardware infrastructure, end user inability, billing issues, redundancy issues, waiting time and missing data/information issues. The following themes were analysed regarding the challenges of the EHR.

- **Procuring the hardware infrastructure**

The results signified that procurement of the hardware infrastructure to enhance the implementation and sustainability of the EHR system was a serious challenge facing the Hospital. From the analysis, the infrastructure procurement included network, electricity, machines and human capital. It was indicated in the study that network issues and electricity issues sometimes affect the smooth operation of the EHR system. Below is an example to buttress this assertion.

> *Procuring the hardware infrastructure is a challenge. Network issues and having a solid team in-house to manage the system is also a problem. It has to be managed by the main university and so when one needs something critically he has to call for a long hours before he could be attended to. The server is linked with the main university system and when that goes down because of electricity fluctuation the system will not be working though the hospital may have light and because the server is up there, any power issue up there affects the system in the hospital. Most of the machines that are used to run the system are faulty that need to be changed (Respondent M1).*

- **End user inability**

The analysis revealed that end users inabilities to use the EHR system represent a greater percentage of the challenge. It is noted that the switch from manual to electronic has not been fully embraced by all staff. Not every staff is conversant with this electronic system

usage. Therefore end users commit certain mistakes in the process. One of the respondents concluded that:

> *Another challenge is the end user of the system who are put off because of IT. Although they are trained, they feel reluctant to use the system and when the time comes for them to use the system, they are either slow or not efficient as we trained them and that is affecting output… (Respondent M3)*

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- **Billing issues**

Another important challenge that emerged from the analysis was the issue of billing in the Hospital. Some participants felt that the EHR scheme did not reduce costs or charges involved in the processes. One of the respondents explained that:

> *When the patient is discharged and she has not got the money to pay that day, the system will not stop billing. Whether the patient is on admission or not, each day the bill keeps increasing until the day the bill is settled. Patients complain that; "my initial bill given was X amount why has it increased by Y amount. Making requisition through the system is sometimes challenging (Respondent M5).*

- **Redundancy Issue**

Another theme that emerged strongly was the issue of redundancy for some workers as a consequence of the EHR scheme being implemented. The EHR system has come to ultimately reduce the number of workers that may be needed at the records department of the Hospital. This issue has become a serious threat to some workers especially those at the records office and with lower qualifications. Respondent one has this to say concerning the issue of redundancy (refer to Table 4.1).

> *It has also come to reduce the number of staff as compare to the manual days especially at the records department (most were not permanent staff, they were laid off). And this happened at the other departments too. All have come to reduce the cost of operations (Respondent M1).*

- **Missing information and Waiting Time**

From the patients' perspective, they also registered some challenges about the EHR system including missing information and time wasting. Patients still wait for a long time. The EHR system has not done much to reduce the waiting time. The respondents noted that in some instances there were always missing information from the system and patients would have to keep waiting for corrections or checking and rechecking among others. One respondent noted that:

> *There are times you go to see a doctor, they will key in your MR number and your information will not be showing, When this happens they call the records officer to come and help, when he comes they will waste a lot of time before they can rectify the issue and the triaging too you go there and sometimes the same issue of not finding your information…* (Respondent P3).

4.6 Discussion of Findings

Discussing the results of the research is based on the study goals as outlined in Chapter One. The section also included additional findings that the study did not set as part of the objectives of the study.

4.6.1 Objective One: Electronic Health Record System in the Legon Hospital

The first object sought to examine the adoption, implementation and use of the EHR in the Legon Hospital among both staff and patients. This objective was measured using the thematic analysis. The managerial level analysis showed that the EHR system is largely used in all departments in the Hospital, with the records being fully kept using EHR and almost all participants in the interview acknowledged that they would want to continue using the EHR. Therefore one theme that emerged was the full adoption and use of EHR. The findings support that fact that the EHR is widely used to enhance medical records in most hospital in both developed and developing hospitals (Deutch, Eva et al, 2010) An electronic

version of an EHR of a patient's health record produced, used and stored historically in a paper graph. A healthcare organization creates, manages and maintains a patient EHR (Zhang, R. et al 2010). Only health professionals involved in the care of a patient can access and use an electronic health record (Zhang, R. et al 2010).

4.6.2 Objective Two: Behavioral Intent to Use Electronic Health Record

The second objective of the study sought to examine the behavioural intents of the use of the EHR system among staffs in the Legon Hospital. This objective was measured by conducting thematic analysis of the interview data. The analysis revealed that respondents expressed the need for the EHR system to be continued and the fact that it yields a positive feedback from patients regarding its quality and increase in satisfaction level. These findings support the view that though there are challenges in fully implementing the EHR, the increase in quality of patient care and efficiency within the medical environment make it worth implementing one (Achampong, 2012). Once again, the finding confirms the notion that the EHR benefits hospitals significantly, including enhanced efficiencies, enhanced health records precision and timely records. (Amatayakul et al, 2005).

However, some other respondents had mixed feeling about the programme regarding its sustainability because of its sophisticated nature requiring a lot of internet data, skilled labour force and frequent maintenance. The findings confirm the concept that the implementation of an EHR scheme appears overwhelming and nearly out of reach for many health care suppliers and administrators as well as medical records / executives of health information. (Grimson et al., 2000) Resistance to certain medical practitioners and health professionals from manual to digital documentation can be a problem in both developed and developing countries. Most health administrators and information managers understand that it may take time to change or at least change health professionals ' behavior and attitude

(WHO, 2006). Again, some of the factors for the slow implementation of EHRs are the enormous costs of the schemes. The lack of national standards and the fact that healthcare providers spend enormous amount of time and money in accordance with public law and the requirements of patient privacy (Morissette, 2011). The EHR system allows for the re-engineering of clinical work processes to produce a more efficient working technique. The other part of healthcare job saving is that medical transcriptions are almost eliminated by EHRs (Seymour et el, 2012).

4.6.3 Objective Three: Electronic Health Record and Quality of Healthcare

The third objective of the study which sought to examine the benefits and impact of the EHR system on the quality of healthcare delivery among both staff and clients at the Legon Hospital was measured using thematic analysis. The results revealed that management benefit a lot from the EHR system through that quality of patients' records, attending to patients simultaneously, quality requisitions, faster and easier booking of appointment among others. These results support the fact that health information technology is anticipated to assist improve health professionals ' efficiency, decrease operational / administrative expenses and improve patient safety when the EHR system is designed and used properly (WHO 2006). The EHR system improves healthcare quality by reducing medical errors. The system can reduce medical errors and reduce overall healthcare costs Improved medical documentation and support systems for clinical decision-making. The EHR also helps to eliminate medical errors through e-prescribing. The other major savings that EHRs will make are the elimination of duplicate testing and patient testing (Connelly et al, 2011).

The results from the leadership view also discovered that, based on the following, the effect of the EHR on quality healthcare service can be regarded as adverse or positive. The analysis

revealed that there is no discrimination in the use of the EHR as to how patients are treated, avoidance of waste, reduction of time spent and harmful delays, respectful and responsive healthcare, no harm to patient and other healthcare outcomes from the use of the EHR or manual, such as receiving occasional hospital reminder calls about booked appointments. The results verified the claim that the EHR scheme eliminates enormous quantities of paper produced when paper files are created and shared. (Seymour et el, 2012). EHR system provides easy access to patients' information to be involved in their healthcare (Connelly et al, 2011).

The findings from the patient perspective showed that the EHR system's impact is evident in triaging, system end-user satisfaction, relative cost of using EHR and other relevant services related to the use of EHR. These results support the expectation that the EHR scheme will help improve health professionals ' efficiency, decrease operational / administrative expenses, improve triage and improve patient safety (WHO, 2006). Other benefits include improved efficiencies, better accuracy of health records and timely and available records (Amatayakul et al, 2005).

4.6.4 Additional Findings

The findings revealed strong themes regarding the challenges of the EHR by both management and patients. The analysis showed some challenges of the system as procurement of the hardware infrastructure, end user inability, billing issues, redundancy issues, waiting time and missing data/information issues. These findings support the view that the obstacles to the EHR scheme may not be available to technology but technical support and the cost of changing to an electronic system coupled with insufficient healthcare funding (WHO, 2006). In many developing nations, expenses, technology accessible, absence of technical knowledge, computer abilities of employees and absence of

information handling equipment are in reality significant problems that need to be resolved before adoption is feasible. (WHO, 2006). In relation to the above, resistance to a shift from manual to electronic documentation by some medical practitioners and health professionals can be issue in both advanced and developing nations. Most health administrators and managers of information know that it may take time to change or at least change the behavior and attitudes of health practitioners (WHO, 2006).

The study findings support the views that the EHR system faced with difficulties, including slow processes owing to either bad software or networking speeds, and system crashes preventing all clinicians from doing their work. It is necessary to develop backup and redundancy schemes. It is noted that the hospital's EHR system can incur huge costs (Connelly et al, 2011). The EHR systems can range from $15 million to $30 million in big hospitals (Seymour et el, 2012). Tiny hospital aligned with a bigger ones, reduces its cost amazingly and consume the entire year's capital budget. (Connelly et al, 2011).

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.0 Introduction

The chapter summarizes the key findings, provides adequate conclusions as well as proposing appropriate recommendations for practice and research.

5.1 Summary of Findings

The aim of the research was to evaluate the effect of EHR on quality healthcare at Legon Hospital using the method, structure and outcome of EHR at the Hospital to measure the quality of healthcare. The research attempted to accomplish its objective through three goals: examining the acceptance, execution and use of the EHR at Legon Hospital among both employees and patients; examining the behavioral intent of using the EHR scheme among Legon Hospital employees; and to examine the benefits and impact of the EHR system on the quality of healthcare delivery among both staff and clients at the Legon Hospital. The study sought to measure its objectives by adopting a qualitative approach with a cross-sectional explanatory design by gathering data through the use of interview guide from a sample size of 11 respondents (6 staffs & 5 patients). The information were analyzed using the method of thematic assessment. The overview of the main results disclosed that the EHR scheme is mainly used in all hospital departments, the documents being fully maintained using HER, and nearly all interview respondents recognize that they would like to continue to use the HER. The results of the study illustrated that participants expressed the need for the continuation of the EHR scheme and the fact that it provides positive feedback from patients on its quality and enhance the level of satisfaction. Key findings

indicated that management benefits a great deal from the EHR system through quality records of patients, simultaneous patient care, quality requirements, and faster and easier appointment reservations, among others. The assessment disclosed that there is no discrimination in using the EHR, waste avoidance, time-waste decrease and damaging delays, respectful and responsive healthcare, no harm to patients is caused by using EHR or manual and other healthcare results. The effect of the EHR scheme is apparent in the system's triage, end-user satisfaction, relatively low cost of using EHR and other appropriate services related to the use of HER. However, due to its advanced nature requiring a lot of web information, qualified labor force and regular maintenance, some other participants had a mixed impression about the program concerning its sustainability. The results disclosed some system problems such as hardware infrastructure procurement, end-user incapacity, billing problems, redundancy problems, waiting time, and missing data / information problems.

5.2 Conclusion

The adoption, implementation and use of the electronic health record technology is a vital component of health service management in health organisations that seeks competitive advantage. As such, healthcare quality is predicted by the full implementation and sustenance of the EHR system in health organisations. This relationship in the hospitals is agreed to be of primary concern to all major stakeholders in the health sector. Also, improving quality of healthcare delivery is one of the most important factors in present day health facilities. Patients or clients expect quality without compromise from healthcare givers. This was tasked to examine the impact of the EHR system on the quality of healthcare delivery at the Legon Hospital. The study demonstrated that the EHR system to a very large extent affects the quality of healthcare delivery in the Legon Hospital. The key

findings indicated that, management benefits a lot from the EHR system through that quality of patients' records, attending to patients simultaneously, quality requisitions, faster and easier booking of appointment, no discrimination, avoidance of waste, reduction in time wasting and harmful delays, respectful and responsive healthcare, end user satisfaction of the system, relative low cost of using EHR among others. The EHR system is however saddled with problem of procurement of the hardware infrastructure, end user inability, billing issues, redundancy issues, waiting time and missing data/information issues. Therefore, the study concludes that the EHR system should supported and sustained by the Hospital and concrete steps should be taken to curb the emerging challenges encountered by the use of the EHR system.

5.3 Recommendations

The study proposed appropriate recommendations based on the recommendation for practice, policy formulation and for future researchers.

5.3.1 Recommendation for Practice and Policy

The study recommends that the University Hospital (Legon Hospital) needs to fully maintain and sustain the EHR system, as it is proven to have several benefits for the hospital. Even though the implementation of the EHR system may be costly, its benefits certainly outweighs the cost of operations.

The study recommends that the Hospital should take proactive steps in training its human resource on the EHR system. This training programme should include activities that can enhance and improve the staff understanding of the EHR system and how to apply at real work settings.

Health service organisation in Ghana must endeavour to review the recent technologies used in enhancing healthcare delivery and implement better schemes that would lead to higher user satisfaction of their workers. These health organisations could institute electronic health record systems that are not only more flexible to the internal users such as workers in the hospitals but also external users such as patients or clients and customers. This could boost their healthcare delivery and promote worker contentment which could result in greater output for the organisation.

Also, other health service organisations especially the hospitals must endeavour to ascertain and sustain the EHR schemes since these schemes enhance quality healthcare delivery. Quality healthcare and end user satisfaction are dynamic and thus, the management of the Legon Hospital and other hospitals could research within the industry to find out where they need to improve in order to engender greater quality of healthcare, staff and patient satisfaction, and commitment.

5.3.2 Recommendation for Future Research

Future studies could replicate this study to examine the impact of EHR on the quality of healthcare delivery. Also, this study was done using both staffs and patients of the Legon Hospital in Ghana, thus, future studies could extend this study to other hospitals since the study was looking at improving healthcare quality in the health sector. A comparative study of both public and private hospitals could offer a great opportunity for future researchers to look at. Furthermore, this study employed the qualitative method; future studies could employ other methods to cover a large range of respondents since that may offer alternative findings to this study and also to reveal where the study fell short with regard to the variables studied.

5.4 Limitations of the Study

As a result of the qualitative approach adopted, the sample size was limited since the study sought to unearth the underlying reasons for the securing and using EHR. Future studies could therefore examine this subject with a bigger sample size. Furthermore, the generalizability of the results to other hospitals may be restricted as the research focused on just one hospital with a sample that is not representative of the entire health industry in Ghana. Notwithstanding these constraints, this study's results are credible and very helpful.

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APPENDICES

Appendix A: Interview Guide for Management

INTERVIEW GUIDE

Time :

Date :

Place :

Interviewer :

Participant Number :

Age:

Sex :
- Male [ ]
- Female [ ]

Educational level:
- Primary [ ]
- Secondary [ ]
- Tertiary [ ]

Job Position Title/Specialty :

Department :

Professional Affiliation :

ICT knowledge :
- Beginner [ ]
- Working skill [ ]
- Advance skill [ ]

Years Worked in Health Sector:
- 3-5 years [ ]
- 6-10 years [ ]
- >10 years [ ]

Experience in working with EHR :	3-5 years	[ ]
	6-10 years	[ ]
	>10 years	[ ]

Opening:

I appreciate your time. This study is to get your perspectives on the impact of EHR on the quality of care at Legon Hospital. These questions pertains to departmental experience with EHR to determine the impact of EHR on quality of care. Confidentiality is assured in this interview. While this form would document your name, you would be assigned a unique number for reference. Please permit me 15 to 20 minutes of your time. You can choose not to answer a question, at any time, if you are not comfortable. Before we start, please let me know if you have any questions or concerns.

Questions:

1. Do you use EHR in your department?
2. Are your records partly or fully electronic?
3. Do you intend to continue the use of EHR in your department?
4. What are the benefits of using EHR in delivering quality care in your department?
5. Describe the impact (positive/negative) that the implementation of EHR have had on the following to ensure quality of care;

   a. Provision of care that does not vary in quality because of personal characteristics such as gender, ethnicity, geographic location and socioeconomic status.
   b. Avoidance of waste, including waste of equipment, supplies, ideas, and energy.

c. Reducing expectations and sometimes damaging delays for both those receiving and caregivers.
d. Providing care that is respectful of and responsive to individual patient preferences and ensuring that patient values guide all clinical decisions.
e. Avoiding harm to patients from the care that is intended to help them
f. Healthcare outcomes?

6. What are the challenges you face in the use of EHR in ensuring better care delivery?

This concludes our session of the interview. I want to thank you for your participation and your time in this study.

Appendix B: Interview Guide for Patients

INTERVIEW GUIDE

Time :

Date :

Place :

Interviewer :

Participant Number :

Age :

Sex :

Male	[ ]
Female	[ ]

Educational level :

Primary	[ ]
Secondary	[ ]
Tertiary	[ ]

Job Title :

Department where care was received

Service received :

ICT knowledge :

Beginner	[ ]
Working skill	[ ]
Advance skill	[ ]

Number of Years attended the hospital:

3-5 years	[ ]
6-10 years	[ ]
>10 years	[ ]

Opening:

I appreciate your time. This study is to get your perspectives on the impact of EHR on the quality of care at Legon Hospital. These questions pertains to departmental experience with EHR to determine the impact of EHR on quality of care. Confidentiality is assured in this interview. While this form would document your name, you would be assigned a unique number for reference. Please permit me 15 to 20 minutes of your time. You can choose not to answer a question, at any time, if you are not comfortable. Before we start, please let me know if you have any questions or concerns.

Questions:

1. Has the implementation of EHR improved or worsen your personalized healthcare?
2. Do you feel respected when receiving care?
3. Has the implementation of EHR increase or reduce your waiting time at the OPD?
4. How easy or difficult is appointment booking at Legon Hospital?
5. Has the implementation of EHR increase or reduce cost of healthcare at the facility?
6. How does EHR affect triaging?
7. Are you satisfy with the kind of service you receive at Legon Hospital?
8. Do you sometimes get certain services that you did not anticipate? Could you please mention few of them?
9. How does the healthcare delivered with EHR compare to the one without EHR. Explain using the indicators from question 1-8.
10. What are your access to care difficulties?

This concludes our session of the interview. I appreciate your answers and your time. I am grateful.