MENTAL HEALTH PROFESSIONALS' PERSPECTIVES ON ELECTRONIC PATIENT RECORD AT THE ACCRA PSYCHIATRIC HOSPITAL

BY
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THIS THESIS IS SUBMITTED TO THE UNIVERSITY OF GHANA, LEGON IN PARTIAL FULFILMENT OF THE REQUIREMENT FOR THE AWARD OF MPHIL NURSING DEGREE.

JULY, 2017
DECLARATION

I, Eugenia Akusika Xatse, hereby declare that this thesis is the result of research undertaken towards the award of the MPHIL Nursing degree at the University of Ghana, School of Nursing. The undersigned supervisors guided the preparation and presentation of this thesis in agreement with the standards laid down by the University of Ghana.

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DEDICATION

I dedicate this work to my darling husband, Pastor Stephen Selase Agbo, for his unwavering support throughout this journey.
ACKNOWLEDGEMENT

The writing of this thesis has been one of the most significant academic challenges I have ever had to face. Without the support, patience and guidance of the following people, this study would not have been completed. It is to them that I owe my deepest gratitude.

First of all, I give thanks be to the Almighty God for giving me the strength and persistence to work through these two years so that today I can stand proud with my head held up high.

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LIST OF ABBREVIATIONS

APH ……… Accra Psychiatric Hospital
DfID ……… Department for International Development
E-health ….. Electronic health
EHR ……….. Electronic Health Record
EMR ……….. Electronic Medical Record
EPR ……….. Electronic Patient Record
GHS ……… Ghana Health Service
HIV.......... Human Immune Deficiency Virus
ICT ……….. Information and Communication Service
IT …………… Information Technology
LMIC ……… Low-and middle-income countries
MHA ……… Mental Health Authority
MHaPP…… Mental Health and Poverty Project.
MHIS ……… Mental Health Information System
MHP ……… Mental health Professional
USA ……… United States of America
UK ……….. United Kingdom
WHO ……… World Health Organisation
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ABSTRACT

Patient records at the Accra Psychiatric Hospital have been stored in paper folders for several decades now and have recently had many challenges due to the increasing number of patients and limited storage space for these paper folders. The main objective of the study was to explore the perspectives of mental health professionals on Electronic Patient Record (EPR). The study adopted a qualitative research design with face to face interviews as the main research instrument. Fifteen participants were involved in the study. Thematic content analysis was used for the data analysis. The study revealed that mental health professionals have knowledge of EPR through their awareness of the concept, understanding of the concept, the content of their knowledge on EPR, their experiences with EPR as well as their attitude towards EPR. It was discovered that enhanced productivity and easy access to information among others were perceived as benefits of EPR in mental health delivery. The study further found that funding, internet connectivity, resistance to change and unstable power supply could be critical hindrances to the use of EPR. In conclusion, participants weighed the benefits of implementing EPR at Accra Psychiatric Hospital over the barriers and were optimistic of the benefits. It is therefore recommended that EPR should be adopted and there should be intense training for mental health professionals prior to EPR implementation, improved internet connection and an alternative source of electricity should be made available.
CHAPTER ONE

INTRODUCTION

1.0 Background of the study

Information and Communication Technology (ICT) has become an enhancing tool in diverse disciplines and professions like government (e-governance), banking (e-banking), education (e-learning), communication (e-mails, mobile phones) and health (e-health) among others (Abodunrin & Akande, 2009; Mayoka, Rwashana, Mbarika & Isabalija, 2012). Indeed, ICT is considered an important tool necessary for enhancing the quality of health care services while protecting the safety of patients through evidence-based practice (Ayatollahi, Roozbehi & Haghan, 2015; Miller & Sim, 2004). It is therefore not surprising to notice how ICT has permeated many areas of health care (McLaren, 2003) including mental health (Blanchard, Metcalf, Degney, Herman & Burns, 2008; Lal & Adair, 2014; Stephens-Reicher, Metcalf, Blanchard, Mangan & Burns, 2011).

Globally, electronic interventions to support and improve mental health care delivery are progressively being explored as an adjunct or alternative to the traditional care delivery system (Musiat, Goldstone & Tarrier, 2014; Stephens-Reicher et al., 2011). Acceptability and satisfaction of these electronic interventions are growing steadily among care providers and consumers alike (Cochran et al., 2015; Donker et al., 2013) since the traditional care delivery system is continually faced with the mounting challenge to reduce cost, improve quality and simultaneously increase accessibility (Bouhaddou, Bennani & Diouny, 2013; Lamminen, Forsvik, Vopio & Ruohonen, 2011). Other outstanding challenges include lack of infrastructure, inadequate funding, geographical barriers and an overwhelming paucity of technical and human resources (Musiat et al., 2014; Ryu, 2012; Saxena, Thornicroft, Knapp & Whiteford, 2007; Schweitzer & Synowiec,
2010). However, emerging technologies in the health care industry promise to be transformative tools that could help surmount some of these identified challenges (Lal & Adair, 2014). These technologies propose greater possibilities for the health care industry especially in low- and middle-income countries (LMIC) whose health systems suffer a greater number of these challenges in very acute forms (Lewis, Synowiec, Lagomarsino & Schweitzer, 2012; Schweitzer & Synowiec, 2010).

Of all the health information technologies in current use, the Electronic Patient Record (EPR) system has continued to receive heightened attention globally and perceived as a catalyst for development and as the gold standard to providing high-quality health care (Porter, Kohane & Goldmann, 2005; Williams & Boren, 2008). Evidently so because, while the weaknesses of the paper patient record system are well known, EPR appears to have greater potentials that permit the pursuit of advanced quality development programmes that may be difficult or otherwise be impossible to achieve with the conventional paper-based records system (Miller & Sim, 2004). For instance, electronic records allow coding of patient information to ensure security and confidentiality whereas such is not possible with paper records (Ogundipe, 2011).

Kluge (2014) and de Veer and Francke (2010) corroborate that EPR is an advanced method of keeping patients information for later use. Health care organisations and nations are increasingly adopting the electronic systems to store patient information obviously due to the many benefits it accrues (Boonstra & Broekhuis, 2010; Christensen & Grismso, 2008; Lawindi, El Shafie & Elden, 2013). The EPR system has a vast array of capabilities ranging from improving quality care to increasing accessibility (Flemming & Hübner, 2013). Being electronic in nature, EPR provides the medium whereby patients’ information can be stored and shared among authorised persons for various health care related purposes (Kluge, 2014).
EPR covers the needs of all relevant stakeholders including patients, health care providers, researchers and policy makers (Aminpour, Sadoughi & Ahamdi, 2014). It ensures accurate documentation which is considered an integral part of professional care (Stevenson, Nilsson, Petersson & Johansson, 2010) and promotes consistency of care through integrative information management. Furthermore, EPR supports evidence-based practice, provides medico-legal evidence, facilitates financial audit, enhances quality monitoring and also, provides accurate information for policy makers, and clinical researchers keen on studying the growing trend of patient histories to detect unknown patterns and unearth new findings (Rind et al., 2013). Cheshire (2014) admits that EPR is gradually altering the face of communication in health care.

Traditionally, clinical records are handwritten with pen on paper (folders/case notes) and filed onto shelves or put into cabinets for safe keeping. It is easy to identify the shortcomings of this system. To begin with, paper records are commonly incomplete. They normally lack vital information such as laboratory results and radiological images. Subsequently, missing information will lead to delays in patient care, repeated laboratory investigations, additional patient visits and increased cost which adversely affect the well-being of patients and increases the burden on clinicians. What is more, the security and confidentiality of paper-based medical records cannot be guaranteed (Kutesa & Frantz, 2016; Zandieh et al., 2008).

Additionally, paper records can merely be at a particular place in time (cannot be accessed from different locations). Therefore they are sometimes inaccessible when needed because they are in use in another department or in a backlog in a filing room (Safran & Goldberg, 2000). Other failings of the paper record system include difficulty in reading clinician handwriting, time-consuming patient case note retrieval and poor organisation (Allorto & Wise, 2015). Progressively, paper records become expensive to preserve, store and retrieve (Uslu & Stausberg, 2008).
cumulative patient information from a batch of paper records for clinical research or practice management can be tedious and very frustrating. Besides, paper records can be prone to disasters, and information security cannot be assured. Another fundamental concept that heightens the need for the electronic system is the need for a readily accessible information system and an integrated delivery system to provide a continuum of holistic services to a defined population. These shortcomings of the paper system justify the upsurge of electronic record keeping.

The United States of America (USA), Australia, most European and some Asian countries have gained some successful years of experience in the use of EPRs in individual organisations and thus progressing towards the regional and national levels (Lau et al., 2012; Yao, Zhang, Li, Sanseau & Agarwal, 2011). In 2008, Estonia began the implementation of a national birth-to-death electronic health record system for its citizens (Tiik & Ross, 2010). Denmark has a centralised electronic database of its populace medical records which enables electronic exchange of clinical data between general practitioners, specialists, health facilities, pharmacies, laboratories, and other clinicians (Eggert & Protti, 2006; Gray, Bowden, Johansen & Koch, 2011; Protti & Johansen, 2010). The Commonwealth Fund’s 2009 International Health Policy Survey reports that nearly all physicians in the Netherlands, Norway and New Zealand use EPR in their practices (Schoen & Osborn, 2009). In 2011, legislation in Finland made it mandatory for all Finnish health care professionals to use e-health (electronic health) systems to render health care services (Schug & Whitehouse, 2013). The UK is ahead of countries like Canada when it comes to the use of EPR in individual clinics and hospitals (Protti, Wright, Treweek & Johansen, 2006). Also, Ireland has in use an integrated web-based mental health information system to facilitate delivery of quality mental health services. The aim of the electronic system is to provide an integrated information
system for service providers, produce timely reports for service planners and policy makers, provide epidemiological data and aid in multidisciplinary research (Donnelly, 2009).

Africa is lagging behind in the adoption and implementation of electronic records compared to high-income countries (Kumar & Aldrich, 2010). Aside most African countries belonging to the LMIC group, other factors have been reported to impact the adoption of electronic records in Africa adversely. Some of these include poor telecommunication infrastructure, poor internet connectivity, unsustainable power supply and other non-technical factors like organisational features, human elements, policies and standards and socio-economic matters (Jennett, Gagnon & Brandstadt, 2005). While it is still a long way to go, it is worth mentioning that major strides have been achieved in the recent past in promoting health-related ICT project initiatives in Africa (Adjorlolo & Ellingsen, 2013) even though evidence indicates such initiatives remain unexploited in mental health. Nonetheless, a search by Akanbi et al. (2012) titled the “use of electronic health records in sub-Saharan Africa” revealed 147 publications. Out of that, 21 papers from 15 less resourced countries in Africa had reported evidence of EPR implementation. They concluded from their study that despite penetration being slow, there has been a significant rise in the use of electronic records over the past decade due to the influx of computers and increased access to the internet in Africa. The African market is flooded with large telecommunication companies which have led to more people having access to the internet (Lazuta, 2013).

All the same, the successful implementation of electronic health records in HIV clinics in East Africa has been reported (Tierney et al., 2010). A qualitative and quantitative comparative study carried out in Uganda to assess the data quality, and staff satisfaction with electronic records showed that although it was not without challenges, most health care professionals preferred the electronic system compared with the paper-based alternative (Ndira, Rosenberger & Wetter,
2008). Similarly, Uwambaye et al. (2017) has it that, a weighty majority of participants (90%) made up of nurses, doctors, cashiers, finance managers, pharmacists, lab technicians, system administrators, and statisticians were pleased with the electronic record system compared with the paper based records within a referral hospital in Rwanda. It is also worth noting that the Rwandan health ministry has introduced the electronic system of keeping patient records in most of its public health facilities to enhance information and communication technology in health care delivery (Gakuba, 2009) as cited in (Uwambaye et al., 2017).

Khan, Shahid, Hedstrom and Andersson (2012) report that many governments in LMICs are willing to invest in ICT infrastructure to boost accessibility and quality of health services. ICT has great prospects to help strengthen the health information system through innovations like EPR in less resourced countries (Schweitzer & Synowiec, 2010). A review of the core objectives of 16 selected e-health (electronic health) projects in Africa revealed that over half of the total number of projects were aimed at improving patient data collection and real time patient diagnosis (Yusif & Jeffrey, 2014). In support, Ogundipe (2011) has reported more than eleven (11) successful years of experience with a paperless medical record system in a clinic in Nigeria and also emphasised the possibility, benefits and efficacy of this technologically-advanced method of patient record keeping in developing countries.

It appears literature is scarce on the use of electronic records in mental health both in Africa and abroad, but especially in Africa, being on the far side of the “digital divide” (Tierney et al., 2010). Albeit literature is quite common on its use in other health disciplines like HIV treatment programmes (Akanbi et al., 2012; Amoroso, Akimana, Wise & Fraser, 2010; Nucita et al., 2009) and maternal and reproductive health in LMICs (Thompson, Castle, Lubeck & Makarfi, 2010).
As part of the Mental Health and Poverty Project (MHaPP) sponsored by the Department for International Development (DfID), there is some form of a computerised Mental Health Information System (MHIS) across the three state owned psychiatric hospitals in Ghana. The MHIS ensures uniformity of data collection to create the stage to broaden the range of mental health-related indicators and to strengthen the information system (Ofori-Atta, Read & Lund, 2010). The limitation of this MHIS is that it was designed mainly to support administrative functions within institutional care rather than a patient-focused electronic record system (Doku, Wusu-Takyi & Awakame, 2012).

Increasing International influence and the importance of e-health has necessitated various national policies and strategies being drawn in Ghana to ensure the effective and efficient use of ICT in the health industry. Inclusive among them are the Health Sector ICT Policy and Strategy (2005) and the National E-health Strategy (2010). The Legislative Instrument (yet to be accepted by Parliament) of the Mental Health Act 846 enacted in 2012 indicates that Ghana aims at using telemedicine (which consists of EPR) as a means to improve service delivery in the sector.

In essence, the use of ICT and its related technologies are not new in the health care delivery system in Ghana. There exist strong federal recommendations, and several successful pilot studies have been completed. For example, a forum convened by the Ghana Health Service (GHS) and Novartis Foundation in Ghana on digital health at scale in LMIC in June 2016 disclosed a successful piloting of telemedicine (a remote method of diagnosing and treatment of patients using telecommunications technology to expand healthcare delivery) in the Ashanti region of the country. Some hospitals like the University of Ghana Hospital have already rolled out on the use of EPR. Under the project “Electronic Health Records for Pharmacovigilance and Safety Assessment”, the WHO Centre for Advocacy and Training in Pharmacovigilance and the
University of Ghana Medical School customised a leading global software (called MedSpina) for safe data gathering and patient management. The software allows clinicians and other health care workers to store all patient information including laboratory results electronically. The system can alert allergies, set up reminders and appointments. It also controls stocks and warns the pharmacist of drug interactions. The software was tested for three (3) years at the Diabetic Clinic of the Korle-Bu Teaching Hospital (the nation’s premier health institution) and found to be very convenient and beneficial (GNA, 2014).

Although the benefits of EPR seem numerous, it is important to explore mental health professionals’ viewpoints about this technology before it is adopted and implemented. This is needed because the viewpoints of mental health professionals on EPR are significant factors that could influence its success in future. Studies have revealed that lack of knowledge, skills, and training among users could be barriers to EPR adoption and implementation. Other barriers include lack of technical expertise, initial costs and reimbursement issues (Ajami & Bagheri-Tadi, 2013; Castillo, Martínez-García & Pulido, 2010; Creswell & Sheikh, 2013). However, the success of EPR in mental health care delivery depends on many factors including adequate knowledge and understanding of the concept, positive attitudes towards EPR usage and enhanced skills to use ICT tools in an enabling working environment (Clarke, Adamson, Sheard, Cairns, Watt & Wright, 2015).

Mental health care is an information-intensive job just like health care delivery in general, and good information is crucial to decision making and effective management in any organisation (Tierney et al., 2010). In recent times, there has been a growing interest towards moving to an electronic system that will support and improve the medical records of patients. Direct computer
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support for clinical practice in mental health, however, is a relatively new idea, and there happen to be only but few studies done in mostly high-income countries.

The creation of clear and accurate patient medical records system, their maintenance and storage, are an important part of the mental health profession. The records of a patient in a psychiatric hospital setting constitute the mental state examination, clinical notes and treatment, as well as other information. These records present an in-depth and continuous documentation of the patient’s condition, which helps to arrive at a diagnosis and contribute to proper patient care. These records have various other purposes, including research, education, administration, reimbursement, quality assurance and can be used as evidence during legal proceedings. There is the need for an integrated electronic record keeping system in mental health to enable providers to deliver quality services supported and informed by an integrated MHIS, but patient records have traditionally been paper-based.

An alternative to the common paper records has emerged with the widespread uptake of the Internet and related communication technologies. Mental health IT departments will need to become agiler to support this changing trend. Stewart et al. (2009) as seen in Fernandes et al. (2013) report that, one of the widest mental health service providers in Europe - SLAM (South London and Maudsley NHS Foundation Trust) developed an electronic psychiatric clinical records system, called the electronic Patient Journey System (ePJS). This system fully replaced the previous paper system with a single electronic system, where daily activities, medication, diagnosis, correspondence and all relevant information necessary for patients’ care are stored. Information on ePJS is accessible by all authorised staff across all sites of SLaM, and as at October 2012, the system had over two hundred thousand (200,000) patient records stored electronically.
Mental health in Ghana is currently in a new dawn with the enactment of the Mental Health Act 846 since March 2012. The Act presents an agenda for building and fostering mental health services across the entire country within regional and district hospitals to increase accessibility and to encourage community-based mental health care. This means that increased demands will be placed on the current MHIS which is mostly paper-based (Doku et al., 2012). Doku et al. (2012) iterated that under the Act, it is required to carry out a certain order of recommended activities, for example, the Mental Health Review Tribunals within a certain period after patient’s admission. Plainly, it means that the current MHIS must satisfy these legal requirements under the Act irrespective of how defective it may be. Serious implications will be incurred, for instance, to inform the attorney of a detained patient, whose case is under trial that the psychiatric case notes (folder) are not available. Under the present system, however, missing and incomplete folders are not unusual - they are considered as a norm. As a result, except the collection, distribution and analysis of psychiatric case records become computerised, mental health care and its providers will be unable to cope with the degree and volume of reporting to meet accountability requirements under the Act 846. Consequently, execution of the Act requires a complete overhaul of the existing MHIS to support an effectual mental health care delivery system.

This then calls for the consideration of a more proficient electronic system to operate if not solely, then in tandem with the present paper-based system and ultimately replacing it with time. In adopting an electronic patient information system, it is imperative to consider the perspectives of its core users to ensure its success. Thus the importance of this study.

EPR is an emerging technology, but the concept has not been explored in mental health delivery in Ghana, so it requires studies to be done to know the perspectives of mental health professionals. Facilitating the adoption of EPR in Accra Psychiatric Hospital calls for information about the
perspectives of the user groups. It is for this reason this study intended to explore mental health professionals’ perspectives on the potential EPR usage in mental health service delivery in Ghana. This study particularly looks at mental health professionals because they are the key drivers in mental health service delivery.

1.1 Statement of the Problem

It is obligatory of health care professionals to gather, record and store medical records of the patients they take care of (Hoerbst, Kohl, Knaup & Ammenwerth, 2010; Kierkegaard, 2011). Patient records at the Accra Psychiatric Hospital have been stored in paper folders for several decades now and have recently had many challenges due to the increasing number of patients. These challenges include the frequent loss of patient records and incomplete records (temporal folders). Over time, these paper folders have consumed every available space (including using part of doctors consulting rooms and cardboard boxes for archiving folders). That notwithstanding, a ward was converted into a filing room – even that has not been able to contain the problem. Consequently, it has become more difficult to trace patient information when they come for review visits and notably delayed access to effective mental health care. All the same, the number of new patients visiting the facility needing new folders continue to increase by approximately 2000 per annum (Unpublished data from Accra Psychiatric Hospital, record keeping department). In 2015, the number of new patients summed up to 2,516 and 1,764 in 2016 (Unpublished data from Accra Psychiatric Hospital, record keeping department). The decline in 2016 could be attributed to the fact that the facility started charging a fee for the case folders plus a token for admission even though mental health care is supposed to be free in Ghana.

Furthermore, it appears epidemiological data on mental illness in Ghana is rare due to the weak and deplorable state of the paper system and the MHIS leading to inadequate empirical data to
support planning and advocacy for mental health care. This is evidenced in the overburdened mental health hospitals, often a shortage of psychotropic medications, abuse of the rights of the mentally ill and the stigma associated with mental illness in Ghana.

Across Ghana, efforts have been made to introduce IT solutions into the health care sector. Despite this growing interests in the health care sector (Lewis et al., 2012), evidence mustered over the years on previous projects indicate that most of these projects have been concentrated in the ‘general’ hospitals leaving out the psychiatric hospitals. Correspondingly, it looks like there is no published work on the use of electronic records in mental health service delivery in Ghana.

This study, therefore, intended to explore mental health professionals’ perspectives on EPR at the Accra Psychiatric Hospital.

1.2 Purpose of the study

The purpose of this study was to explore mental health professionals’ perspectives on EPR at the Accra Psychiatric Hospital.

1.3 Specific Objectives

1. To explore the knowledge of mental health professionals on EPR.

2. To identify the perceived benefits of EPR in mental health care delivery.

3. To identify the perceived challenges in the use of EPR in mental health care delivery.

4. To explore ways of mitigating the perceived challenges associated with EPR.

1.4 Research Questions

1. What is the knowledge of mental health professionals on EPR?

2. What is the perceived benefit of EPR in mental health care delivery?

3. What are the perceived challenges in the use of EPR in mental health care delivery?
4. How can the perceived challenges associated with EPR in mental health care delivery be mitigated?

1.5 Significance of the Study

This study is significant because the world is fast entering into a technological age and the health care industry is moving along with it. The electronic record system has been on the platform for several years but in Ghana, no mental health facility has yet implemented this type of system. At least, at the time this study was conducted, no article was found on academic or professional journals about EPR implementation in mental health in Ghana. In this regard, this study is the first one carried out in this country and the results will uncover new perspectives in both the clinical and academic setting.

The findings of the study could enable government, policy makers, the mental health authority and other relevant stakeholders in the health sector to make informed decisions regarding the adoption and implementation of EPR in mental health service delivery.

Additionally, it will add to knowledge and serve as a source of reference for future projects and research works.

1.6 Operational Definition

Electronic Patient Records: Refers to the electronic version of the traditional paper-based patient records system that allows patients’ medical details to be shared between different health care professionals.

Mental health professionals: Qualified mental health nurses, medical archivist (recorders), pharmacist, medical doctors and psychiatrists.
CHAPTER TWO

THEORETICAL FRAMEWORK/ LITERATURE REVIEW

2.0 Introduction

This chapter consists of two sections which include a description of the theoretical framework used that is Rogers Diffusion of Innovation Theory and the review of relevant literature.

2.1 Rogers Diffusion of Innovation Theory

Theories and models are essential in guiding a research process (Neuman, 2006). Therefore, as its theoretical framework, this study adopts the Diffusion of Innovation Theory (DIT) first popularised by Everett Rogers in his book *Diffusion of Innovations* which was first published in 1962, and it is now in its fifth edition (Rogers, 2003). The theory seeks to explain how innovations are taken up in a population.

Everett Rogers (March 6, 1931 – October 21, 2004) was an American communication theorist, a sociologist and a distinguished professor emeritus in communication studies (Rogers, 2008; Singhal & Dearing, 2006). His research and work are widely accepted in communication and technology adoption studies, and also in a variety of other social science studies. Rogers was also able to relate his communications research to practical health problems as well.

The DIT is one of the most frequently used technology diffusion and adoption models (Sherry & Gibson, 2002) developed to explain the process by which innovations in technology are adopted by users. For several decades, the process of adopting or not adopting a specific IT-based innovation has been widely researched into, and several models and theories have emerged. Some of these are the Technology Acceptance Model (TAM and TAM2) and the Unified Theory of Acceptance and Use of Technology (UTAUT) (Albrecht et al., 2017; Holden & Karsh, 2010). The
researcher, however, found Rogers’ Diffusion of Innovation Theory (2003) most appropriate for investigating the perspectives of mental health professionals on EPR. This is because Roger’s DIT puts forward some prior conditions (previous practice, felt needs, innovativeness and norms of the social system) that affect innovation adoption, explains the process of adopting an innovation, and projects the constructs that affect acceptance of innovation which is all of great relevance to this study.

2.1.1 The Four Elements in the Diffusion of Innovation

Rogers (2003) defines diffusion as “the process in which an innovation is communicated through certain channels over time among the members of a social system” (p. 5). According to him, the four main elements that influence the diffusion of new ideas are: (1) the innovation itself, (2) which is communicated through certain channels, (3) over a period, (4) among the members of a social system.

“An innovation is an idea, practice, or project that is perceived as new by an individual or other unit of adoption” (Rogers, 2003, p. 12). An innovation may still be perceived as new even though it may have been invented in time past; if the idea seems new to an individual, then it is an innovation to them. The newness features of an innovation are linked to the steps of the innovation-diffusion process (knowledge, persuasion and decision). One challenge however to the adoption of an innovation is uncertainty. The consequences of an innovation create uncertainty. Rogers (2003, p. 436) defined consequences as “the changes that occur in an individual or a social system as a result of the adoption or rejection of an innovation”. Uncertainty can be curtailed if individuals are knowledgeable of the benefits and barriers of adopting the innovation so that they are mindful of all its consequences (Sahin, 2006).
Communication Channels. Rogers (2003) explains communications as “a process in which participants create and share information with one another in order to reach a mutual understanding” (p. 5). This occurs through channels and between sources. A source maybe an individual or an institution generating the message whereas a channel is the way a message gets transmitted from the source to the receiver. Rogers enlightens that diffusion is a particular kind of communication involving an innovation, two individuals or other units of adoption, and a communication channel; the essence of the diffusion process is to communicate a new idea. Mass media channels such as TV, radio, newspaper or the internet are fast and efficient means to inform an audience about an innovation, which is creating awareness-knowledge. Interpersonal channels involve a two-way communication between two or more individuals that have knowledge of or experience with using the innovation. Interpersonal channels are more effective in persuading an individual to adopt an innovation.

Time illustrates one of the strengths of diffusion research even though it is often ignored. Perhaps because measurement of the time dimension can be criticised since it is based on respondents recall.

Social System according to Rogers (2003) is “a set of interrelated units engaged in joint problem solving to accomplish a common goal” (p. 23). The social system could be made up of individuals, organisations, informal groups and/or subsystems. Diffusion of innovations occurs in a social system therefore it is influenced by the social structure of the social system in diverse ways.
2.1.2 The Innovation-Decision Process

This is the process through which an individual or other decision making unit passes from first knowledge of an innovation, to forming an attitude toward the innovation, to a decision to adopt or reject, to the implementation of the new idea, and confirmation of this decision (Rogers & Coleman, 2003). The innovation-decision process is “an information-seeking and information-processing activity, where an individual is motivated to reduce uncertainty about the advantages and disadvantages of an innovation” (Rogers, 2003, p. 172). The process follows five stages as articulated by Rogers (2003) in the DIT:

The **Knowledge** stage is where an individual is aware of an innovation and has an idea about how it works. “What,” “how,” and “why” are the critical questions asked and the individual attempts to determine “what the innovation is and how and why it works” (Rogers, 2003, p. 21). According to Rogers, the questions form three types of knowledge: (1) awareness-knowledge, (2) how-to-knowledge, and (3) principles-knowledge. Awareness-knowledge represents the knowledge of the innovation’s existence. This type of knowledge can motivate the individual to learn more about the innovation and, eventually, to adopt it. How-to-knowledge, contains information about how to use an innovation correctly. To increase the adoption chance of an innovation, an individual should have a sufficient level of how-to-knowledge prior to the trial of the innovation. Principles-knowledge includes the functioning principles describing how and why an innovation works. An innovation can be adopted without principles-knowledge, but the misuse of the innovation may cause its discontinuance.

The **Persuasion** stage follows the knowledge stage in the innovation-decision process and occurs when an individual (or other decision-making units) forms a favourable or unfavourable attitudes toward the innovation based on what the individual knows about the innovation. Rogers states
that while the knowledge stage is more cognitive- (or knowing-) centred, the persuasion stage is more affective- (or feeling-) centred. The degree of uncertainty about the innovation’s functioning and the social reinforcement from others (colleagues, peers, etc.) affect the individual’s opinions and beliefs about the innovation.

The **Decision** stage is where an individual (or other decision-making units) makes the choice to adopt or reject the innovation. If an innovation has a partial trial basis, it is usually adopted more quickly, since most individuals first want to try the innovation in their own situation and then come to an adoption decision.

The **Implementation** stage is putting the innovation to use. Reinvention is most likely to occur at the implementation stage. Reinvention is “the degree to which an innovation is modified by a user in the process of its adoption and implementation” (Rogers, 2003, p. 180). He added that the more reinvention takes place, the more rapidly an innovation is adopted and becomes institutionalized. As innovations, computers technologies consist of many possible opportunities and applications, they are open to reinvention and thus more likely to be adopted (Sahin, 2006).

At the **Confirmation** stage, the innovation-decision has already been made but the individual begins evaluating the results of the decision. Rogers (2003) cautioned that the decision can be reversed if exposed to conflicting messages about the innovation. However, the individual tends to stay away from these messages and seeks supportive messages that confirm his or her decision.
2.1.3 The Attributes of Innovations

Rogers (2003) suggested five characteristics of an innovation that influence the rate of technology adoption. The characteristics of the innovation, as perceived by the members of a social system, determine its rate of adoption. These qualities are not viewed in isolation but they interact and are judged as a whole. Rogers (2003) stated that “individuals’ perceptions of these characteristics predict the rate of adoption of innovations” (p. 219). They are:

**Relative Advantage** is “the degree to which an innovation is perceived as being better than the idea it supersedes” (Rogers, 2003, p. 229). The degree of relative advantage may be measured in economic terms, but others such as social-prestige factors, convenience, and satisfaction are also often important components. Even though an innovation may have countless advantages in itself, what really matters is whether an individual perceives the innovation as advantageous. The greater the perceived relative advantage of an innovation, the more rapid its rate of adoption.
The provoking thought here is whether mental health professionals perceive the EPR system as advantageous over the current paper system in use, and whether the EPR system can improve service delivery at the Accra Psychiatric Hospital if adopted and implemented?

**Compatibility** according to Rogers (2003) “is the degree to which an innovation is perceived as consistent with the existing values, past experiences, and needs of potential adopters” (p. 15). A compatibility in IT with individual needs may positively affect the individual’s IT use. If an innovation is compatible with an individual’s needs, then uncertainty will decrease and the likelihood of adoption will increase. Thus, even naming the innovation is an important part of compatibility. What the innovation is called should be meaningful to the potential adopter. What the innovation means also should be clear.

EPR is relatively a new idea but could replace the traditional paper way of storing patient data and documentation at the Accra Psychiatric Hospital.

**Complexity** is defined as “the degree to which an innovation is perceived as relatively difficult to understand and use” (Rogers, 2003, p. 15). The more an innovation is perceived as complex, the lesser its chances of being adopted. Complexity explains the perceived degree of ease associated with the use of the innovation. If the hardware (the tool that embodies the technology in the form of a physical object) and the software (the information base for the tool) are user-friendly, then they might be adopted more quickly.

**Trialability** is the “degree to which an innovation may be experimented with on a limited basis” (Rogers, 2003, p. 16). The more an innovation can be tried, the faster its rate of adoption. As discussed earlier in the implementation stage of the innovation-decision process, reinvention may occur during the trial of the innovation. Then, the innovation may be changed or modified by the
potential adopter to suit its specific needs. Increased reinvention may create faster adoption rate of the innovation.

The EPR technology can be tested or tried by mental health professionals before making a commitment to adopt it or not.

**Observability** is the last characteristic of innovation and Rogers (2003) defined it as the “the degree to which the results of an innovation are visible to others” (p. 16). The easier it is for individuals to see the results of an innovation, the more likely they are to adopt it. Some health facilities have implemented EPR technology in professional practice thus mental health professionals can see the benefits of its use.

### 2.1.4 Limitations to Diffusion of Innovation Theory

There are several limitations to Diffusion of Innovation Theory, those applicable to this study include the following:

- Much of the evidence for the DIT was not developed to explicitly apply to adoption of health innovations.
- It doesn't take into account an individual's resources or social support to adopt an innovation.

To conclude, Eastin (2002) noted that while the diffusion of innovation model provides a framework by which to study a given innovation, each innovation differs and so it should be conceptualized based on its specific attributes.
2.1.5 Summary

The theory puts forward that, before the adoption of any innovation, prior conditions including previous practice, felt needs, innovativeness and the norms of a social system may have triggered an interest. According to Rogers (2003), the process of innovation comprises five stages: knowledge, persuasion, decision, implementation and confirmation. He argued that innovations offering more relative advantage, compatibility, less complexity, trialability, and observability will be adopted more rapidly than other innovations. He however admonished that, getting a new idea adopted, even when it has obvious advantages, is difficult (Rogers, 2003). Therefore, the availability of all of these variables of innovations may speed up the innovation-diffusion process even though it will not be without challenges.

2.2 Literature Review

Literature review is the critical review of previous studies relating to a research topic with the goal of preparing the ground for new research. This chapter examines literature on the perspectives of health care professionals about EPR in the delivery of health care, with particular attention paid to mental health. That notwithstanding, the literature on the perspectives of mental health professionals was rare therefore the researcher had to glean from the perspectives of other health care professionals.

The research strategy involved an extensive and systematic searches from databases such as EBSCO, MEDLINE, CINAHL, SAGE, Science Direct, PubMed, African Journals Online and Google Scholar. These databases were accessed mainly through the University of Ghana on-line data repository. In an attempt to obtain a comprehensive body of the existing literature, a number of different search terms were used including key words like “perception”, “mental health professional”, “clinicians”, “health care providers”, “ICT in health”, “ICT in mental health”,

“electronic patient records”, “electronic medical records”, “electronic health records” and appropriate combinations thereof to facilitate a rich harvest of existing data.

This section was sequentially guided by the objectives of the study, the constructs of the Diffusion of Innovation Theory and emerging themes from the data.

2.2.1 Electronic Records

A wide range of terms has been used to describe electronic records in the literature (Aminpour et al., 2014). Electronic Patient Record (EPR) is one of the many terms, and others are Electronic Medical Record (EMR), Computer-based Patient Record (CPR), Electronic Health Record (EHR), Personal Health Record (PHR) and Computerised Medical Record (CMR). While some authors like Aminpour et al. (2014) and Boonstra and Broekhuis (2010) argue that the terms may be treated synonymously, other authors for example de Veer and Francke (2010), Garets and Davis (2005) and Kierkegaard (2011) are of the view that the terms are distinct and represent entirely different concepts and thus should be treated as such. Clarke et al. (2015) acknowledge that there is some ambivalence concerning the differences between the terminologies and yet it looks like some studies are indifferent about the vast range of terminologies. Furthermore, it is observed that the name, type, content and extent of electronic records were specific to some countries/institutions or geographical locations. For instance, Clarke et al. (2015) mentioned that EMR is to the USA while EPR is to the UK. In this study, the researcher does not emphasise the several terms existing, since one of the objectives is to explore participants’ knowledge on the subject. However, like Knaup, Bott, Kohl, Lovis and Garde (2007), the researcher considers the term EPR as the generic concept for all electronic records in this study.
2.2.2 Definitions of EPR

The following focuses on research that is concerned with the definitions of EPR systems. It aims to answer the questions: how is EPR defined in earlier research?

The concept of EPR covers a wide range of definitions, from files compiled in single departments to long term collections of patient data electronically (Häyrinen, Saranto, & Nykänen, 2008). Some authors simply explain that it is the computerised version of paper records (Jensen & Aanestad, 2006; Kluge, 2014). Similarly, Rezae, Ahmadi, and Sadughi (2007) define it as an individuals’ information that is saved digitally. Conversely, Aklilu (2012) contends that EPR is not a simple replacement of the paper record system. In his view, simply computerising the content of paper records will lead to deficiencies thereby defeating the purpose of the electronic system. He suggests that challenges identified with current health care documentation such as privacy and confidentiality, and issues on quality control measures must be addressed first before adopting and implementing an electronic record system. This point of view can be appreciated because the study was conducted in an African country where paper records are associated with gross challenges.

In their opinion, the longitudinal electronic record of a patient health information generated over time in any care delivery setting defines EPR (Yao et al., 2011). In the same way, EPR means the electronic collection of clinical narrative and diagnostic reports specific to an individual patient (Safran & Goldberg, 2000). The International Organisation for Standardisation also defined electronic records as “a repository of patient data in digital form, stored and exchanged securely, and accessible by multiple authorised users” (ISO, 2005).
2.2.3 Content of EPR

The following focuses on research that is concerned with the content of EPR systems. It aims to answer the questions: how is the content of EPRs described in previous studies?

According to Kluge (2014), EPR typically contain patient’s diagnosis, treatments, vaccinations, family medical history and all relevant medical history as well as patient’s demographic data. According to him, EPR may consist of information that is not found in paper record files like laboratory test results, and diagnostic images with comments. In the same vein, Yao et al. (2011) agree that EPR contains patient demographics, progress notes, problem notes, medication information, vital signs, past medical history, immunisations, laboratory data and radiology reports. Similarly, EPR contains information that affords a continuous view of an individual's key health history and care such as existing health conditions, physician visits, hospitalisations, test results, and prescribed drugs (Gagnon et al., 2009; McGinn et al., 2011). Adding on, EPR contains a person's life time information stored digitally with the purpose of supporting continuity of care, education, and research (Rezae et al., 2007). At times, decision support systems are used to facilitate its operations to help alert physicians about drug interactions, incongruous dosages, and other drug-related problems to enhance clinical decisions (Ayatollahi et al., 2015). Boonstra and Broekhuis (2010) are of the view that, EPRs generates readable and well-organized records for instant access to all providers in the health care chain thereby promoting coherent and consistent care. Kierkegaard (2011) commented that the features of the EPR include a repository of a clinical database containing medical information about the patient, computerised entry for physicians, clinics and hospitals as well as pharmacies to allow the exchange of data information electronically with all entities within the health network.
EPR systems document patient morbidity, treatment and care over time (Roque et al., 2011). They contain different types of structured and unstructured data, ranging from coded diagnoses, ordinary physiological measures, bio bank data, laboratory test results, medication prescriptions, and treatment plans. Also free text notes such as admission notes, discharge notes and nursing notes (Häyrinen et al., 2008; Knaup et al., 2007; Roque et al., 2011). Puskar, Aubrecht, Beamer and Carozza (2004) conclude that the electronic system of keeping patient records entails all components of the patient’s medical records and enables any member of a patient’s treatment team to access the patient’s progress notes, treatment plans, medications, and other patient information from multiple locations.

2.2.4 Structure of EPR

The following focuses on research that is concerned with the structure of EPR systems. It aims to answer the questions: how is the structure of EPRs described in previous studies?

Defining a standard structure is crucial to electronic patient recording (Fridsma, 2013). This is important to support clinical care processes, increase patient safety, enhance care quality, enable quality monitoring and increase evidence based management by improving the collection of statistical data (Shekelle, Morton & Keeler, 2011). The literature identifies different ways of structuring patient data with varying impacts (Hyppönen et al., 2014). The different methods of structuring EPR data is however unique to countries or institutions and have varied over time. Häyrinen et al. (2008) identified three classifications of the structure of electronic records; time-oriented, problem-oriented and source-oriented. When data is presented in a chronological pattern, it is termed time-oriented medical record. Problem-oriented medical record is when patient’s problem is labelled according to the “Subjective information, Objective information, Assessments
and Plan” (SOAP). In the source-oriented record, the content of the record is organised in the order by which the information was obtained.

The American Nurses Association (ANA) also has a structure for nursing documentation comprising four stages: assessment, diagnosis, planned or delivered interventions and outcomes which also corresponds with the SOAP structure for medical documentation.

2.2.5 Users and uses of EPR

Predominantly, clinical information is shared between authorized users for patient care and financial reimbursement. In the same way, EPR is used by approved professionals and also by administrative staff. Health care professionals who use different components of the EPR include physicians, nurses, radiologists, pharmacists, laboratory technicians and radiographers (Häyrinen et al., 2008). Others are patients and their care givers, researchers and policy makers. Information documented in EPR is done by different professional groups. Secretarial staff or data entry clerks sometimes record data by dictation from nurses’ or physicians’ manual notes (Häyrinen et al., 2008). Some patients also document information themselves which is validated by physicians (Tang, Ash, Bates, Overhage & Sands, 2006).

The uses of EPR include providing standardised care, supporting clinical decisions, storing information for research, reducing costs and the length of stay in a hospital, and improving workflow in health care organisations (Blumenthal & Tavenner, 2010; Jha, Li, Orav & Epstein, 2005; Wang et al., 2003). EPR is also able to reduce duplication of information and also decrease the time required to complete clinical tasks. Improving internal communications, coordinating medical teams, and reducing the time that staff spend on reviewing, verifying and correcting clinical instructions are other examples (Moody, Slocumb, Berg & Jackson, 2004). Apart from
medical and nursing uses, EPR is also used for allied health education, research, social services, public health, regulation, litigation, and commercial purposes such as the development of new medical technology and marketing (Anderson, 2000). EPRs also provide information for health policy planning.

2.2.6 Attitudes towards EPR

Health care professionals’ attitudes toward EPR systems compared with paper-based, studies show positive attitudes (Hertzum & Simonsen, 2008; Lau et al., 2012). Sinclair, Holloway, Riley and Auret (2013) in their qualitative study on clinician perceptions of acceptability of online mental health resources in rural Australia revealed some interesting results from in-depth interviews with participants. Clinicians interviewed comprised general practitioners, psychologists, psychiatrists, and clinical social workers. On the whole, clinicians were positive about the implementation of online mental health resources, giving preference to integration with current services. They however reported that, such technologies should be used as an adjunct means rather than an alternative to traditional approaches. Likewise, after a comparative intervention study with qualitative and quantitative methods comparing paper-based records (Pre-test) and electronic records (post-test), Ndira et al. (2008) reported that majority of the hospital staff were satisfied with the electronic system.

Inversely, results from studies conducted by Stevenson et al. (2010) and Stevenson and Nilsson (2012) showed that nurses being the largest group of health care workers expressed great dissatisfaction with EPR. They attributed the cause of their displeasure to the reason that the EPR systems were not designed to meet the needs of clinical practice and as a result, not user-friendly. The authors concluded their study with a recommendation for nurses to be directly involved in the EPR software design to ensure it suits the needs of the nursing practice and supports patient safety.
Correspondingly, Anders and Daly (2009) mentioned that, nurses are critical stakeholders who can affect EPR implementation either positively or negatively, and significant attention should be directed to them for example through training (Thede, 2008).

2.2.7 Benefits of EPR

It is believed that EPR has the capability to address many of the current challenges in health care. Patients, health care professionals, organisations and the general public are anticipated to profit from the usage of EPR (Marutha & Ngulube, 2012; McGinn et al., 2011).

Research question two of this study explores the potential benefits of using EPR in a Ghanaian mental health setting as perceived by mental health professionals. The following are some benefits of EPR initiatives noted in the literature (also summarised in APPENDIX B). These benefits are not mutually exclusive but interrelated with each other.

Improved Quality Care and Enhanced Productivity

The use of EPR is believed to increase quality care (Miller, West, Brown, Sim & Ganchoff, 2005). Quality is the degree to which health care services rendered to patients improve their overall well-being. One of the benefits reported in the literature is increased quality care which can positively affect patient’s health (Chaudhry et al., 2006; DesRoches et al., 2008). Simple warning tools that help clinicians reduce possible errors like drug incompatibility and interactions resulting in significant improvements in quality of care is a key benefit of EPR (King, Patel, Jamoom & Furukawa, 2014). Other quality improvement activities EPR offers are improved data organisation, accessibility and legibility (Jha, 2010). Fox, Poikonen, and Gumper (2008) are of the view that, the ultimate aim of any EPR system should be towards improved patient outcome.
Hosker (2007) documented that computerisation has assisted nurses in the fulfilment of their complex role and as a result enhanced the quality and efficiency of practice. According to Kelley, Brandon and Docherty (2011) however, the use of electronic nursing documentation to improve patient outcomes is uncertain. Others find, for example, that electronic records have neither enhanced clinical practice nor patient care, nor have they improved patient outcomes (Darbyshire, 2004).

EPR systems are designed to support workflow, make documentation easy and possibly allow the clinician enough time to spend in direct interaction with the patient since saving time looking for patient records is another great advantage of EPRs compared to paper records (Shields et al., 2007). In support, Rotich et al. (2003) reported in their study that, patient had 38% less waiting time after the installation and implementation of a computer-based patient record system in a Kenyan rural health centre. On the contrary, McGinn et al. (2011) reported loss of clinical productivity and decreased job performance, especially during the transition period to an electronic system.

**Easy Accessibility and Availability**

One key advantage of EPRs for health care professionals is improved access to patient information plus simultaneous access for multiple users (Christensen & Grimsmo, 2008; Hoffman & Podgurski, 2011; Wallis, 2007). EPR offers immediate access to patients’ clinical folders and its details from any location, thereby saving time, improving coordination (Ogundipe, 2011) and treatment accessibility (Donker et al., 2013). A study conducted by Meredith (2009) affirmed that 91.7% of participants agreed that information was made readily available with the electronic system.
Reduced Human error and Increased Safety

It is estimated that EPR implementation can reduce common errors committed by professionals and thus result in care that is safer for the patient (Hillestad et al., 2005; Peña-López, 2010). Improving safety can also be achieved through tracking of patient’s medication (Sood et al., 2008).

EPR makes clinical notes and documentation legible, reducing clinical errors associated with illegible handwriting therefore increasing safety as well (Ammenwerth, Eichstadter, Haux, Pohl, Rebel & Ziegler, 2001).

Reporting and Research

Reports for institutional, regional or national repositories can be generated easily from well organised EPRs. EPRs can also be used to reduce the need for redundant recording. Correspondence, such as progress, referral, and discharge letters can also be prepared electronically with data in the EPR (van Ginneken, 2002). Furthermore, EPR provides a better mechanism for analysing and reviewing patient outcomes. Its flexible output formats could be customized to meet the needs of patients, payers, referral sources, and other relevant parties who use health information (Kumar & Aldrich, 2010). In agreement, van Ginneken (2002) added that the EPR system can automate essential functions thereby improving quality reporting and reduce the health care professional’s burden. Msukwa (2011) added that EPR reports are easier to generate, useful and easy to understand compared to paper based reports.

Concerning research, EPR supports the handling of data for clinical research by authorised persons. Cumulative data from EPR will assist in tracking the spread of, or risk factors for disease (epidemiology), and in clinical research, to determine whether certain treatments are more effective than others (Aklilu, 2012). EPR can facilitate routine data collection on mental health through research to provide the relevant stakeholders (e.g. government decision makers) with
information (evidence) to make informed decisions to improve the sector (Bird et al., 2010). This could also help increase the priority of mental health.

**Decision Support**

Decision support is a broad function of EPR that supports diagnosis making and treatment policy which often involve both assessments of health parameters and treatment (Wyatt, 2000). EPR can provide reminders to routine screenings, prescriptions, administration of vaccines and other health maintenance benefits. EPR also supports collaborative decision making among multidisciplinary teams of health care professionals. Other decision support tools offered by EPR include drug allergy/interaction alert, clinical reminders, drug dosage reminders, suggestion for diagnosis and treatment options (Hoffman & Podgurski, 2011). According to López-Robledo, Torres-García and Santiago-Medina (2014), EPR may contain tools, such as smart phrases, that can aid assessment in mental health conditions, specific evidenced-based treatment interventions and facilitate health documentation with structured templates. By means of electronic messaging, EPR can also improve communication between mental health professionals with case consultation, treatment planning and coordination (Steinfeld & Keyes, 2011).

**Complete and Accurate Data**

It has been shown in several studies that the use of an information system was conducive to more complete and accurate documentation by professionals. Results from Meredith (2009) in a study conducted in the UK on EPR evaluation in community mental health showed that 88.5% of participants were satisfied with the system accuracy of EPR. In the same way, Makoul, Curry, and Tang (2001) reported that an EPR system enhances the ability of physicians to complete information intensive tasks.
The survey from Marutha and Ngulube (2012) revealed that out of all the participants, 98% thought that electronic records management could reduce some of the problems like shortage of filing space, missing and misfiling folders/case notes, damage to records, and a shortage of staff.

**Continuity of Care**

EPRs have a greater advantage for storing, processing, and retrieving information and the electronic system is significantly faster than the paper-based system. This affords immediate access to previous information thus aiding continuity of care (Kierkegaard, 2011). Also increased communication between health care providers through the electronic system would positively affect continuity of care (Flemming & Hübner, 2013). Results from Bouamrane and Mair (2013) indicate that general practitioners view continuity of care as an integral benefit of EPR.

**Less Paper and Better Storage**

Huge amounts of information can be stored digitally taking up less amount of space. The electronic system thereby eliminates file storage problems that exists with the pen and paper system (Aklilu, 2012).

**2.2.8 Barriers to EPR Adoption**

While the benefits are compelling, it is also important to consider the barriers that may be associated with EPR adoption and implementation. Ball, Hannah, and Douglas (2000) noted that integrating IT into health care is challenging. Some concerns and barriers associated with the adoption and implementation of EPR are mentioned below and also summarised in APPENDIX C.

Despite various studies proving the importance of EPR, other studies have also shown that adapting it to the health care setting has proven difficult and rates of use have been limited (Sood
et al., 2008) especially in LMIC because of some challenges associated with its use. Even in resource endowed nations, EPR systems is not without challenges.

In their study, Sood et al. (2008) examined the challenges faced by the health care workforce toward the implementation of EPR, results revealed that many of the clinical workforce in LMIC were considered computer illiterate hence, many initiatives die out or fade away even after good pilot runs and in many cases very few initiatives are sustained usually in an elementary application level (Lewis et al., 2012).

A study conducted in Ghana suggests that, 47% (21 respondents) see unstable electricity supply as a potential barrier; 18% (8 respondents) stated high cost of training personnel, maintenance and cost of acquiring an EPR system; lack of technical know-how (6 respondents out of ) and four said resistance to change from the traditional paper-base system representing 13% and 9% respectively (Williams & Boren, 2008).

Miller and Sim (2004) emphasised that the high initial costs of implementing EPRs is a major barrier to EPR adoption. Some other authors are of similar opinion (Adams, 2008; Grant, 2008). That notwithstanding, a systematic review of literature by McGinn et al. (2011) showed that health care professionals (in 19 studies, 36.5%) considered cost as a barrier to EPR implementation. In fact, some authors are of the view that, without full upfront funding, EPR adoption would not be achievable (Samantaray et al., 2011). In addition to the start-up costs, implementing the electronic system requires extensive commitment to system administration, control, maintenance, and support in order to keep it working effectively and efficiently. These costs include the long-term expenditures incurred in monitoring, modifying, upgrading and maintaining the system, which could be significant and hence serve as a barrier to adoption (Boonstra & Broekhuis, 2010).
Avison and Young (2007) in their work on “Time to rethink health care and ICT” mentioned that several LMIC are able to make significant investments in research to develop information systems that would meet the need of their particular health care system. This is in sharp contrast to the health care infrastructure of these countries. In many of these countries, implementers of health care information technology based solutions are faced with multifaceted challenges such as inadequate funding, lack of resources and weak health care infrastructure. The technological infrastructure needed for the implementation of EPR include computers and servers which need constant power supply, internet connectivity, dust-free and temperature regulated environment to increase their lifespan but since these are resource intense features – it spells luxury for many LMICs perspectives (Akanbi et al., 2012).

Boonstra and Broekhuis (2010) concluded in their study on barriers to the acceptance of EPR by physicians by identifying eight categories of barriers to EPR as perceived by physicians. The eight main categories of barriers are: A) Financial, B) Technical, C) Time, D) Psychological, E) Social, F) Legal, G) Organisational, and H) Change Process. According to them, all these categories are interrelated with each other. They added that the process of EPR implementation should be treated as a change project, and led by implementers or change managers, in medical practices. They believe that the quality of change management plays an important role in the success of EPR implementation.

Studies that presented health care professionals’ view point on computer literacy found that they were generally unfamiliar with computers (Greenhalgh et al., 2008; Jensen & Aanestad, 2006) resulting in their resistance to EPR. Some hospitals sometime invest in IT without appropriately assessing the basic computer skills of its end-users which often leads to failure (Szydlowski & Smith, 2009). Further, good typing skills are required to enter patient details (medical information,
notes and prescriptions) into the electronic system, and some health care professionals lack the skill (Boonstra & Broekhuis, 2010; Castillo, Martínez-García & Pulido, 2010).

Another possible problem in the use of EPR is the ability of the system to crash resulting in the loss of information, time wasted and frustration for the user (Puskar et al., 2004). Computers crashing along with bugs (viruses) in the system are some of the downsides (Hunter & Ciotti, 2005). Walter, Cleary and Rey (2000) noted that some health care professionals are unenthusiastic to embrace EPR because some systems can be user unfriendly and may not meet the specific needs of certain specialties in health care.

Implementing an EPR means switching from paper-based to electronic-based systems, and this involves transferring records between the two systems. The time and cost burden associated with record conversion, may outweigh any acknowledged potential benefits of EPR. As a result, the time required to convert records is considered as a barrier to the integration of EPRs in medical practices (Davidson & Heslinga, 2006). Similarly, data entry is considered a barrier to EPR implementation (Loomis, Ries, Saywell Jr & Thakker, 2002; Ludwick & Doucette, 2009). In Loomis et al. (2002), more than half of the EPR users stated that data entry was both cumbersome and time-consuming. As such, data-entry is a widely experienced barrier among health professionals.

2.2.9 Factors to mitigate challenges and disadvantages

Highlights from the study of Musiat et al. (2014) show that, to address the challenges that come along with the electronic system of recording, it is important to raise awareness amongst health care workers about the growing evidence base for computerised mental health interventions. For
e-mental health to have a large public health impact, there is a need for improving the translation of e-health research into clinical practice.

Limited information is available about the level of training and utilisation of IT among health care professionals especially in LMICs. However, Msukwa (2011) is of the view that, proper and well-structured training is essential prior to the use of EPR in order to promote acceptance. Comprehensive staff training is considered essential in any health care delivery system. Extensive staff training programs, coordination and planning to train staff from all sections across the facility, are required prior, during and after implementation of an EPR system. Another study by Mohamed and El-Naif (2005) found that physicians with low computer literacy had more concerns with perceived workload issues stemming from EPR usage. The authors recommended that there is a need to engage physicians and practitioners in computer activities and training in order to successfully implement EPRs. It was also recommended that strong support needs to be provided by the Ministry Of Health for all stages of implementing EPRs (Mohamed & El-Naif, 2005).

The issue of health care professionals being afraid of change should also be taken into account because usually change is a painful learning process. Health care professionals should be enlightened on how they stand to benefit from the electronic system so that they can build a positive mind-set toward it (Marutha & Ngulube, 2012).

According to Adeleke et al. (2014) and Lewis et al. (2012), for successful implementation of EPR in LMICs, more sustainable sources of funding, greater support for the adoption of the electronic and better ways of maintaining, sustaining and evaluating impact are required. Adjorlolo (2013) and William and Boren (2008) mentioned constant internet connectivity from good venders and
alternate source of electricity (e.g. generator/plant, solar power) to assist mitigate the barriers of internet connectivity and power outages respectively.

To combat the huge data transfer from paper to electronics, Häyrinen et al. (2008) suggested secretaries or data entry clerks could be employed but authors such as Anderson (2000) and Hoffman (2010), are more concerned with protection of patients’ security and confidentiality.

2.2.10 Summary

A critical review of the literature in relation to EPR and health and how it impacts on the delivery of mental health care exposes a paucity of research, and thus provides an informative, contextual and theoretical basis for this study. While research in this area in the mental health setting is rare, it is almost non-existent especially in Africa and Ghana for that matter despite evidence of its benefits.

The benefits and barriers of EPR in health care have been identified along with the factors that can assist in addressing the challenges associated with the introduction of EPR in health care.

Previous studies identified in the literature suggest how EPR in health influences care, influences staff and service users and yielded gaps in current research that includes the area of mental health. The use of EPR in mental health is required to review services that are underpinned by best practice and will assist in delivering quality service. This is where this literature review has identified a gap in previous studies. This current study will address this gap in research by obtaining mental health professionals’ perspectives on EPR in mental health care. If successful, this exploratory study could possibly provide a baseline for further research in Ghana. The methods used to undertake this are described in the next chapter.
CHAPTER THREE

METHODOLOGY

3.0 Introduction

This chapter describes how the researcher obtained data to answer the research questions. Areas covered include the research design, the research setting, the target population, sample size, sampling technique, research tool and method for data collection. Data management, pre-test of interview guide, data analysis and measures of ensuring methodological rigour follow in that order. The chapter ends with the highlights of ethical considerations.

3.1 Research Design

This study used a qualitative descriptive exploratory approach to examine mental health professional’s perspectives on EPR. This approach to research is used to discover knowledge and to understand the rich description of ‘meaning’ from participants perspective (Fain, 2013; Neergaard, Olesen, Andersen & Sondergaard, 2009; Silverman, 2013). It also describes events as accurately as possible in a logical sequence depicting the values research participants ascribe to those experiences and events (Neergaard, Olesen, Andersen & Sondergaard, 2009).

Qualitative approach was used for this study because the objectives set for the study requires a rich and in-depth understanding from participants’ perspective. This approach gave the researcher the opportunity to explore, understand and describe in details the depth of the phenomenon under study.

The exploratory design helps to present the worldview of a phenomenon from participants point of view (Brink & Wood, 2001). The use of the exploratory design required personal involvement of the researcher with a quantified number of people. This design is usually used when little is
known about the phenomenon under study to allow the researcher to gain detailed insight into that phenomenon (Brink & Wood, 2001).

3.2 Research Setting

The Accra Psychiatric Hospital was the facility of choice for this study because it has majority and a greater diversity of mental health professionals and secondly, it is the most frequented among the three state owned psychiatric hospitals in Ghana. The proximity of the hospital to the researcher was another factor which motivated the researcher in choosing the Accra Psychiatric Hospital as the research setting.

Accra Psychiatric Hospital is one of the three government owned psychiatric hospitals in Ghana located in the heart of Greater Accra, the capital city of Ghana. It is the oldest among the three psychiatric hospitals, usually the most populated (staff and patients alike) even though it has the smallest land size. Built in 1904 but commissioned 1906, the 600 bed capacity facility appears to be the most preferred facility possibly because of its central location. The wards are divided into ten male and six female wards. The hospital can boast of staff including psychologists, occupational therapists, medical doctors, psychiatrists, medical assistants and nurses of all categories.

The Hospital is responsible for the treatment, welfare, training and rehabilitation of the mentally ill. The University of Ghana Medical School has a faculty established in the hospital for undergraduate training in psychiatry and postgraduate training under the West African College of psychiatrists (WACP). Nurses from all over the country are also affiliated to this hospital for a 6-month proficiency training in psychiatry.
Clinical problems handled in both training and practice includes a range of neuro-psychotic disorders, manic-depressive illnesses, schizophrenias, epilepsy, alcohol and drug abuse etc. The hospital has also been part of active awareness campaign on mental health. The hospital has the following departments for the effective execution of its vital functions: Out Patient Department (O.P.D), Accounts Department, Nursing and General Administration, Environmental Sanitation, Biostatistics (Medical Records) Department, Telephone Exchange Unit, Pharmacy, Occupational Therapy Department and Laboratory.

The biostatistics/medical records department is responsible for filing and retrieving patient folders on every visit. The department also collates and reports monthly, quarterly, mid-year and yearly data on all admissions, discharges, new attendants, mortality and other similar relevant information. Variables such as age, sex, marital status, legal status and diagnosis are used to present this data. Currently these records are generated manually within the facility.

The Accra Psychiatric Hospital gets power from the local electric grid, which obtains majority of its power from the Akosombo Hydroelectric Dam. Power rationing sometimes result when there is break down of the machinery or during dry seasons when the water level in the dam drops. When this happens, certain locations and services within the country are deprived of electric power on a rotational basis so that the reserve can be used for essential services such as hospitals and security facilities. The Accra Psychiatric Hospital is not considered to warrant receiving continuous power for unknown reasons. Therefore, to ensure continuous power supply, the facility has a stand-by generator which is used only when the management has enough funds to purchase fuel during a power outage.
3.3 Research Population

The target population comprises the total group of study participants with certain characteristics that are of interest to the researcher (Nieswiadomy, 2008; Polit, Beck & Hungler, 2001). The study population for this study were all mental health professionals working at the Accra Psychiatric Hospital. This population covered the total aggregate that the research findings will be generalised to.

3.3.1 Inclusion Criteria

i. Mental Health Professionals with at least one year of experience working at the Accra Psychiatric Hospital including mental health nurses, psychiatrists, medical doctors, pharmacy technicians and recorders.

3.3.2 Exclusion Criteria

i. Part time staff at the Accra Psychiatric Hospital

ii. Students

3.4 Sample Size

The sample size is a subset that is drawn from a population to represent the whole population (Nieswiadomy, 2008). In qualitative research, there is no generally agreed sample size. However, in order to arrive at an appropriate sample size, the researcher took into consideration the research questions, data saturation and the purpose of the study to determine the sample size (Elo et al., 2014; Higginbottom, 2004). The interest of qualitative research is on getting quality information and not quantity. This is achieved through saturation in data collection. Data is said to saturated when subsequent interviews yield no new information (Morse, Barrett, Mayan, Olson & Spiers,
2002; Padgett, 1998). Saturated data ensures comprehension and completeness of the data (Elo et al., 2014).

In order to elicit rich information from study participants, the researcher conducted in-depth interviews with fifteen (15) study participants. The final sample size however was determined during data collection when participants introduced no new perspectives on the topic under study and the new data collected did not add any further explanation of the phenomenon being investigated (Back, 2012; Mason, 2010).

3.5 Sampling Technique

Sampling is the process of selecting persons or subjects from a group in order to gather information that describes the larger group (Khan, 2012). This study used purposive sampling to select participants for the study. Cohen, Manion and Morrison (2005) posit that purposive sampling is the most appropriate non-probability sampling technique for qualitative studies. Purposive sampling method was used to identify and select mental health professionals as per the above description to give a detailed account of their perspectives regarding EPR.

3.6 Research Tool

Data collection tools are designed to obtain data on a particular topic of interest. A Semi-structured interview guide with open-ended questions based on the research questions, constructs of the conceptual framework and the reviewed literature were used as a tool for collecting data.

This method of data collection granted the study participants the opportunity to give a detailed description of their experiences as they desired and the interviewer also had the prospect to seek clarification by probing into the issues arising from the interview (Kusi, 2012).
The interview guide had two sections. First section was on demographic data while the second section comprised guiding open-ended questions on participants’ knowledge on EPR, their perceived usefulness, perceived challenges as well as ways of mitigating the identified challenges (Appendix E).

3.7 Data Collection

An introductory letter (Appendix F) in addition to ethical clearance (Appendix G) from the ethics committee of Noguchi Memorial Institute for Medical Research was presented to the management of Accra Psychiatric Hospital for permission to collect data at the facility. Once permitted, the study started in accordance with the hospital protocol. Potential participants were briefed on the purpose of the study and the information sheet was presented to them for clarification. The researcher first established rapport and booked appointments with each participant at their preferred time and setting to ensure full cooperation and minimal distractions during the data collection process. Data collection began with a review of the entire study protocol explaining to participants the potential benefits and risks of the research and obtaining of signatures on the consent form (Appendix D) authorizing consent for participation. Permission and approval was sought to audio-tape the data collection process. The interviews involved open ended questions (Appendix E) and subsequent probing questions. Participants were allowed to talk freely without any unnecessary interruptions. Each interview lasted between thirty-five to sixty (35-60) minutes. The interviews were all conducted in English covering issues on EPR, its perceived usefulness, perceived challenges and suggestions as to how to minimize the identified challenges.

Field diary was used during the interview process to take note of all the major happenings of the day and the non-verbal communication cues portrayed by study participants. Important incidents that occurred with each interview session were documented in the field diary. This was done to
ensure several sources of data collection to enhance the validity of the study. The researcher ensured that the audio recorder was functioning well and fully charged for each interview session. Participants were encouraged to ask questions to clear any doubts before the interview section started. Data were collected through face-to-face interviews during which participants were encouraged to relax, feel free and express their thoughts and feelings. The researcher used probing questions to help participants contribute meaningfully to the discussion.

At the end of each interview session, the researcher labelled the interview conducted, listened to the recordings severally, read and re-read the field diary and tried to align notes written with each interview. The researcher also played back the recorded interview to each participant to ensure that all important data had been collected. The researcher, certain of data gathered, then transcribed the interviews verbatim. The transcribed data were read and re-read looking for phrases, keywords and statements. The researcher also made reflections on what happened, why the particular incident took place and how it actually did happen.

Finally, all the activities of the day with regard to the interview were summarised after which modifications and adjustments were made to improve upon subsequent interviews. Saturation was reached in the data collection process with the fifteenth participant as no new perspective concerning the topic under study was obtained. All information from participants were kept safe. All appropriate documents such as the signed consent forms, demographic data, transcribed interviews and field notes were filed. The audio recordings were also stored on hard drives and kept safe electronically.
3.8 Data Management

Data management involves organizing and keeping data properly to enable easy access and analysis (Padgett, 1998). Information about each interview, the date, time and place was recorded in a field diary. Each transcript was numbered and given pseudonyms. All transcripts, field diary and soft copies of audio recordings of the interview are kept safely under lock.

Demographic data of respondents were separated from the transcripts and audio recordings to avoid the risk of linking them. All stored data are accessible to only researcher and supervisors for up to five (5) years.

3.9 Pre-test of Interview Guide

The researcher conducted a pre-test of the interview guide on two professionals (a mental health nurse and a physician) at the Pantang Hospital. This facility has similarities with Accra Psychiatric Hospital in terms of patient care and hospital administration. The participants involved in the pre-test study were not part of the original research participants. Conducting a pre-test helped the researcher to find out if the interview guide was able to collect data that would answer the research questions as well as identify the pitfalls in terms of ambiguity of questions, leading or double barrel questioning and the duration of the interview sections so as to make the necessary adjustments before using the data collection tool for the original study.

The pre-test also allowed the researcher to develop better interviewing skills needed to elicit richer information on mental health professionals’ perspectives on EPR.

3.10 Method of Data Analysis

All aspects of the data collected including field notes and interviews were analysed using thematic content analysis. This technique allowed the researcher to disintegrates the text into relatively
small units, looking for trends and patterns of words, their frequency and relationships so as to give a detailed description of the data (Vaismoradi, Turunen, & Bondas, 2013). The thematic content analysis for this study comprised three stages:

Stage One: Preparation Phase

At this stage, the researcher listened to the audio recorded interviews several times to become familiar with its contents, understand it and make meaning of each interview. The data were then transcribed, read and re-read to know the depth and breadth of what the data entailed. As the data were read carefully, interesting ideas in the data were highlighted to assist the researcher in her analysis.

Stage Two: Organising

The researcher after reading the entire data set then treated each interview’s transcript as a whole document. Unit of analysis of data was carried out by examining line by line of each sentence of all the data set to inductively generate codes that capture the meaning and content of each sentence. After identifying all the codes emerging from these sentences, the codes were compared with the original text to see whether the codes reflect or are congruence with the text. The identified codes were then analysed to find out how different codes could combine to form an overarching theme. This the researcher did by considering the relationship between codes, their similarities and differences to form sub-themes. The themes and identified sub-themes were correlated with the entire data set. Codes that did not appear to fit into the main themes and sub-themes were also noted. The themes, sub-themes and all the extracts of data that were coded with pseudonyms of study participants were organised using the Nvivo11 software for analysing qualitative data.
Stage Three: Reporting

The researcher after developing the themes and subthemes of the study reflected on the commonalities and differences of the identified themes and sub-themes, their collated data extracts in relation to the content of the data sets and analysed how they conform to the research topic, questions and the purpose of the study. Finally, a detailed report of the results of the study was written, highlighting the study’s findings and supporting them with verbatim quotations from study participants.

3.11 Methodological Rigour

The trustworthiness criteria recommended by Lincoln and Guba (1985) was employed in this study to ensure methodological rigour. According to Lincoln and Guba (1985), trustworthiness is ensured by establishing credibility, transferability, dependability and confirmability in qualitative research.

Credibility refers to the confidence one has in the truthfulness of the research findings. Credibility was ensured in this research by spending enough time with participants during the interaction process. This enabled the researcher to establish proper rapport and build trust. Member checking was also done by making follow up interviews for participants to validate the accuracy of the transcribed data and the themes that emerged. Also a colleague experienced in qualitative analysis was made to code two of the transcripts after which comparisons were made to ensure objectivity in the coding process and to eliminate bias. This is consistent with verification by peer debriefing.

Transferability refers to the ability of the study findings to be applied in similar settings (Lincoln & Guba, 1985). Transferability was ensured by creating narration of the research process (Streubert & Carpenter, 2007). This was achieved through detailed descriptions of the whole
research process for one to be able to evaluate how the findings from the research can be applicable to individuals and situations with similar characteristics as that of the study. Important observations were documented as field notes so that the researcher’s decisions, choices and insights could be monitored by the supervisors. All transcribed data and field notes are being kept for the purpose of an audit trail. It is hoped that this study will be meaningful to others in similar settings.

Dependability refers to the consistency of the findings and whether or not it can be repeated by other researchers (Polit et al., 2001). This was ensured by describing in details the research methodology under which the research was carried out. The detailed description of the research methodology would offer readers of the study the opportunity to assess how far the researcher followed the approved guidelines for conducting the research as this would pave the way for future researchers to repeat the study. The researcher again explained the data gathering process into details, elaborating on what really took place on the field, the number and length of data collection and the time period data were collected.

Lincoln and Guba (1985) described confirmability as the degree of neutrality or the extent to which study findings are determined by the respondents without any bias, motivation or interests from the researcher. Confirmability was ensured by ensuring that all her preconceptions about the study were made known in her research report. The researcher explained in detail her decision for choosing a specific research methodology and conceptual framework guiding the research. The researcher also gave an audit trail to help readers know the step by step approach taken in conducting the study. Finally, the researcher verified from study participants whether the transcribed data represented their ideas or what they intended to share with the researcher.
3.12 Ethical Considerations

Ethical clearance was sought from the ethics committee of the Noguchi Memorial Institute for Medical Research (NMIMR) for approval. An introductory letter (Appendix F) was taken from the University of Ghana School of Nursing to the management of the Accra Psychiatric Hospital to seek permission for the study to be carried out in that facility. Participants were made to demonstrate consent to participate in the study by signing the consent form (Appendix D) after explaining the purpose and procedures of the study. The participants were informed that they can opt out of the study anytime they so wished despite signing the consent form. No form of coercion was used to attract or retain them. Participation was entirely voluntary.

The participants were also informed that each interview session will be audiotaped and that they were free to answer or not answer the questions put to them. Privacy and confidentiality was ensured by interviewing each participant alone and holding all information provided confidential, not making it accessible to others.

All data including audiotape recordings, field notes of all interviews and other relevant materials are being kept safely under lock by the researcher for up to five years, to ensure privacy and confidentiality. Only the researcher and supervisors have access to the raw data. In place of the participants’ real names, pseudonyms were used in reporting findings in order to ensure anonymity. There were no risks involved and no cost was incurred by participation in the study.
CHAPTER FOUR

FINDINGS

4.0 Introduction

This chapter describes the findings from the data collected from mental health professionals on their perspectives on EPR at the Accra Psychiatric Hospital. It begins with a description of participant’s demographic characteristics, followed by a presentation of themes and sub-themes generated from the data in a table, then a detailed description of the themes and sub-themes backed by verbatim quotes from the data and finally ends with a summary.

4.1 Participants Demographic Characteristics

Fifteen health professionals of the Accra Psychiatric Hospital who met the inclusion criteria and accepted to take part in the study were interviewed after selection. Eight (8) females and seven (7) males constituted the sample size. None of the participants was less than the age of 20 years; six (6) participants were within the age range of 21-30; seven (7) participants were between 31-40 years and one (1) participant fell within the age ranges of 41-50 and 51-60 each. Five (5) participants were married while ten (10) were single. With respect to the highest educational level attained, three (3) of the participants had Diploma level; ten (10) had attained the Degree level; one (1) had Masters Degree and the remaining one (1) had achieved a Doctorate. The participants comprised eight (8) mental health nurses, four (4) recorders (medical archivist), one (1) medical doctor, one (1) psychiatrist and one (1) pharmacy technician. Four (4) of the participants have had working experience of less than five (5) years; six (6) participants have had working experience between 6-10 years; three (3) participants for 11-15 years; and one (1) each for the ranges of 16-20 years and above 20 years.
4.2 Description of Themes and Sub-Themes

A total of five (5) major themes and thirty-three (33) subthemes emerged from the data. This was achieved using the diffusion of innovation theory as a guide as well as the objectives of the study. The major themes are: knowledge on EPR, performance expectancy, perceived barriers, mitigating perceived barriers and dissatisfaction with paper records. Direct quotes from participants were used to support the issues that emerged from the theme.
Table 1: Themes and sub-themes

<table>
<thead>
<tr>
<th>THEMES</th>
<th>SUB-THEMES</th>
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<tbody>
<tr>
<td>Knowledge on EPR</td>
<td>Awareness of EPR</td>
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<td></td>
<td>Understanding of EPR</td>
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<td></td>
<td>Content of knowledge on EPR</td>
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<td></td>
<td>Experience with EPR</td>
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<td></td>
<td>Attitude towards EPR</td>
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<td>Computer literacy and use</td>
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<tr>
<td>Perceived benefits of EPR</td>
<td>Enhanced productivity</td>
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<td></td>
<td>Reduces or prevents loss of records</td>
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<td>Continuity of care</td>
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<td>Relative advantage over the paper system</td>
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<td>Easy access to information</td>
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<td></td>
<td>Reduced human error</td>
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<td></td>
<td>Reduction of paper use</td>
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<tr>
<td>Perceived barriers of EPR</td>
<td>Funding</td>
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<td></td>
<td>Internet connectivity</td>
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<td></td>
<td>Resistance to change</td>
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<td>Computer illiteracy</td>
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<td>Unstable power supply</td>
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<td>Lack of maintenance</td>
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<td>Data transfer to EPR</td>
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<td>Mitigating perceived barriers</td>
<td>Sustainable source of funding</td>
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<td>Willing workforce</td>
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<td>Improving computer literacy</td>
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<td></td>
<td>Sustainable energy supply</td>
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<td></td>
<td>Routine maintenance</td>
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<td></td>
<td>Data entry clerks</td>
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<tr>
<td>Dissatisfaction with paper</td>
<td>Missing records</td>
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<td>records</td>
<td>Duplication</td>
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<td></td>
<td>Limited storage space</td>
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<td></td>
<td>Inconveniencing to patient and staff</td>
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<td></td>
<td>Inaccurate data</td>
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</tbody>
</table>
In order to answer the first question “what is the knowledge of mental health professionals’ on EPR” the theme “knowledge on EPR” was identified.

### 4.3 Knowledge on EPR

Participants narrated their knowledge of what they perceived EPR to mean. These included their awareness of the concept (EPR), their understanding of the concept, the content of their knowledge on EPR, their experiences with EPR, general attitude towards EPR and also recounted the skills in computer usage. To start with, mental health professionals demonstrated fair knowledge of the concept. Almost all participants were aware of the concept even though it is still an emerging technology in Ghana. Some were able to give specific details of the concept while others judged based on the name (electronic patient’s records). Some however went further to explain the details of what EPR may contain. A greater majority of participants were of the view that the content of EPR is similar to that of the paper system while a few elaborated that the electronic system may contain information such as laboratory results which are often not found in the paper folders. Others also shared their experiences with EPR from other facilities (all private hospitals) and their general attitude towards EPR was positive. Concerning participants’ skills in computer usage, they related that even though they do not use computers at work, all of them have smart phones and nearly all have personal computers. A few participants have had extra tuition in computer usage while most of them merely have computer knowledge based on their mainstream school training in computers either from the junior, senior or tertiary level.

### 4.3.1 Awareness of EPR

Nearly all participants were aware of the term EPR although some used similar concepts such as “computerized records” or “electronic health records” or “paperless system” to relate to it. Their awareness of the concept was obtained basically from school, workshop, colleagues, TV, friends
Mental Health Professionals’ Perspectives On Electronic Patient Record

and relatives leaving abroad and own experience. Lorm, Dora, Hope, Joy and Kwame shared their views as follows:

*Ok! So the computerized system of keeping patients’ information ... yes I know about it ... I did my national service at LEKMA (government hospital) and they started it but it was on the initial stage when I left.* (Lorm, Pharmacy Technician)

*I know about the electronic system. We’ve discussed as colleagues and in management meetings ... and I’ve actually experienced some form of it as a patient in the private hospital my family and I attend* (Dora, Mental Health Nurse)

*You mean the paperless records ... it’s common to see it these days on the television ... some friends and family living abroad have also spoken about it before* (Hope, Mental Health Nurse)

*I actually heard about the electronic health record system way back in 2014 at a workshop I think (paused) no, no, no, I think the first time was rather in school at the training college and again at the workshop, yes!* (Joy, Mental Health Nurse)

*“I had never heard about the term (EPR) until recently a colleague here, Mr. Adams (pseudonym) mentioned it to me but I know something of the sort exist”* (Kwame, Recorder)

However, only one participant reported she was unfamiliar with the term but tried to infer from the meaning of “electronic” and had this to say:

*I know nothing about it. I have not precisely heard of the term before but I think from the word itself, I think electronic has got to do with technology, gadgets ... less paper.* (Ama, Mental Health Nurse)

4.3.2 Understanding of EPR

All participants shared their understanding of the concept of EPR. A few had detailed understanding of the concept while others narrated based on the meaning of the term.

“... Doing away with our paper and writing system whereby everything is kind of harnessed in such a way that patients carry their folder numbers or identity cards so that once they get to the hospital at any particular point along the chain of management their records can be accessed without necessarily carrying a folder around ...” (Ato, Medical Doctor)
“Basically, it is going paperless in that ... every information about the patient is stored electronically ... information will be transferred and viewed electronically” (Dela, Mental Health Nurse)

“It’s just like feeding the patient information into the computer where it will be accessible to the nurses and then the doctors and people at the records so that it will be easier for them to retrieve the patient information as and when they need it” (Lorm, Pharmacy Technician)

“It is an electronic system of keeping patient’s records at the hospital for easy access to authorized units or personnel” (Akos, Mental Health Nurse)

However, a few participants had little to say;

“I have little knowledge about it. I know it is a computerized form of storing patient information ... so a folder is prepared for you on a computer and forwarded to the prescriber who after clerking, forwards a prescription to the pharmacy for the patient to pick up his medication” (Joy, Mental Health Nurse)

4.3.3 Content of the information

A number of participants shared that the content of EPR will not be any different from the content of a paper folder.

“... It contains clinical diagnosis, investigations, medications...” (Dora, Mental Health Nurse)

“...The age of the patient, the sex, the marital status, number of children...first date of attendance, any relations or next of kin, the languages the patient can speak, the hometown and then the residence address...it also contains the patient’s past medical history...nursing notes, progress reports and notes from specialist...” (Joy, Mental Health Nurse)

“...Name, diagnosis, social history, medical history, vaccinations and allergies... (Hope, Mental Health Nurse)

4.3.4 Experience with EPR

Most of the participants had personally experienced EPR one time or the other when they visited another facility as patients or accompanied a patient.

“I have experienced some form of it ... it wasn’t in this hospital though. It was in a private hospital...” (Hope, Mental Health Nurse)
“It’s actually the clinic myself and my family attend and they use the electronic system of recording.” (Dora, Mental Health Nurse)

“Personally, I haven’t (experienced EPR) but I have seen it in a private facility – I took someone there and I saw them using it and I was very impressed.” (Dela, Mental Health Nurse)

“Yeah! I went to Sel hospital (not original name), where I noticed that apart from they having patients’ folders for record keeping, where the doctor updates the patient’s illness or whatever in it, they also have a computer or desktop, laptop where they keep the patients’ records” (Eyram, Mental Health Nurse).

Nearly all the participants who had experienced EPR, did not have any hands-on-experience with the system but one of them had experienced EPR while working as a health professional at another facility.

“Yeah! It’s got its good sides, it’s downsides from the little I experienced...” (Ato, Medical Doctor)

Another experienced it, though brief and during its early stages of introduction, as a national service person, also at another facility.

“I did my service at a private hospital (name withheld); they started it (EPR) but I left at its initial stages...” (Lorm, Pharmacy Technician).

There were yet some of the participants who never had any experience with EPR in any capacity.

“No! None at all” (Ama, Mental Health Nurse)

“No! But I have heard that at the (name of hospital withheld), they have it and then at (name of hospital withheld) too, they have it” (Eva, Mental Health Nurse)

Despite the absence of an experience by one participant, he demonstrated some level of knowledge by volunteering information on how it works by virtue of information received from a colleague.

“I haven’t any experience about it but Mr. (name withheld) was telling me about it ... he said that the whole of the patient hospital encounter is documented on the computer ... no paper.” (Kwame, Recorder)
In all, most of the participants had in one way or the other experienced EPR in varied capacities, either as patients, a relative to a patient or a health professional.

### 4.3.5 Attitude towards EPR

The general attitude or response of the participants towards EPR was that of a welcoming one.

“...We are more favourably inclined towards changes and towards the electronic system”
(Sefa, Recorder)

A participant was greatly impressed when she first experienced EPR from another facility.

“Personally ... I saw them using it (EPR) and I was very impressed.” (Dela, Mental Health Nurse)

Another participant, after witnessing, how EPR was used in another hospital, found it very intriguing and did not hesitate to calling for its implementation in the APH.

“So that is how I saw it (EPR)... and it was interesting. I really want my hospital to have it... I would have really wished that we had it at the mental hospital” (Eva, Mental Health Nurse)

Another participant demonstrated a welcoming attitude to EPR by proposing its immediate implementation to the management of APH in two (2) consecutive years.

“We even proposed it to them (APH management) since last year... and as at now, we have not received it. We again proposed it this year...” (Kwame, Recorder)

A number of participants also showed a welcoming attitude to EPR when asked whether its implementation should be of high priority.

“Yes! It should be ....it should be a major priority” (Hope, Mental Health Nurse)

“...If management will go ahead and adopt...the electronic system, it will go a long way to help in terms of service delivery” (Dora, Mental Health Nurse)

The attitude of great expectation for EPR was also expressed by some participants since it would enhance the smooth discharge of their duties.
“...We will come to work and be happy working because this (EPR) will be faster” (Efo, Recorder)

A few, however, after expressing their welcoming attitude to EPR, were of the opinion that some members of staff would not embrace EPR and resist same when implemented since their jobs will be threatened due to their lack of knowledge in the use of the computer and their reluctance to learn its use.

“People are going to resist and obviously, if people are not ready to learn, it means that they are going to be displaced from their jobs because... we are dealing with electronic devices here, where you need to have knowledge about how to use it...”(Eyram, Mental Health Nurse)

“...People who are very ignorant about how easy it would be will kick against it” (Ama, Mental Health Nurse)

“Staff, who are unwilling to adopt the new technology will pose as a challenge because they will be like draw backs” (Dora, Mental Health Nurse)

One of them was also indifferent as to whether EPR would affect his work schedule in any way.

“I think it wouldn’t be any different. It is just normal documentation but this time it will be on a computer” (Hope, Mental Health Nurse)

The attitude of indifference was also demonstrated by another participant, who was of the view that EPR would not benefit majority of mental patients who mostly come without a relative and cannot identify themselves to aid the retrieval of their history from the system. This was after he had identified the benefits of EPR.

“Well!...At least, if you have a relative, the relative can say when the patient last visited the facility ....but apart from that it won’t help majority of them (who do not visit the facility with a relative)” (Efo, Recorder)

4.3.6 Computer Literacy and Use

Participants had varying levels of literacy in computing and used this in different facets of life including, work, research and entertainment. Majority of the participants acquired knowledge in
computing via mainstream education such as senior high school education, diploma, first degree and master’s degree.

“I did, first, HND in statistics and it was compulsory to do statistical programmes/packages like SPSS...I also took a course in public administration during which we had some education on computer usage....” (Efo, Recorder)

“I had a lot of (computer) training in school. From SHS (senior high school), the training college and the university” (Hope, Mental Health Nurse)

“Lectures! I learnt it (ICT) from campus. It was part of a course from level 100 to 200” (Kwame, Recorder)

“It (ICT) was part of mainstream education ... a part of the course I did” (Dela, Mental Health Nurse)

“...My first degree, there was a programme, an ICT programme where they were training us how...you would operate the computer” (Eyram, Mental Health Nurse)

“Oh yes! I’m a master’s degree holder so at least my first degree, I did it (ICT)” (Eva, Mental Health Nurse)

“Yeah! Both at the diploma level in school and when I was having my first degree” (Ama, Mental Health Nurse)

“... (ICT) was part of our training at the university for research purpose” (Akos, Mental Health Nurse)

A few participants, however, had special training in computing in addition to the mainstream education in computing. One clearly indicated that he started but stopped at a point in time and intends to resume same.

“I started and stopped! I was doing Excel Programming...and I stopped. So I just want to start from where I left” (Lorm, Pharmacy Technician)

Another, responded in the affirmative when asked whether he intentionally attended a computer training school to acquire knowledge in computer apart from mainstream education.

“Yes, I did! I went to learn that and then with time, I continued with the mainstream aspect” (Dela, Mental Health Nurse)
One of the participants indicated her ability to use the EPR when introduced at the APH with little training considering her level of literacy in computing.

“...So I’m sure if the system is implemented, I will be able to use it with little training...”
(Joy, Mental Health Nurse)

Even though there are only a few computers available at the APH, some of the participants do own a computer or have ever owned a computer.

“I own a personal computer...” (Hope, Mental Health Nurse)

“Yes! I own a computer” (Dela, Mental Health Nurse)

“Yes, I did own a computer but it was stolen” (Eyram, Mental Health Nurse)

The general use of computers by most of the participants, in their personal lives, were identified as for research, presentation or reporting, communication and entertainment.

“Oh I use the computer for a whole lot of things. If I have to go for a presentation on a topic, I go on the internet, get my information, put them together ...in a manner in which I can ...do the presentation... (and) I use the computer for my research work” (Eva, Mental Health Nurse)

“...For me as a professional, most of the time, I do research... and so I use the internet as a research tool...Aside that...the entertainment aspect...there’s the news aspect too...”
(Ato, Medical Doctor)

“I send and receive emails. I’m able to write reports on my computer and print them out for management” (Ama, Mental Health Nurse)

“...At least I can use it to take data and assess a few files and all that... But something that I can use to do my work and find...some useful information for my research work...my teaching practice...” (Eyram, Mental Health Nurse)

“I use computers for word processing, power point presentation, emailing and research”
(Kwesi, Psychiatrist)

One of the participants, responded in the affirmative when the researcher paraphrased his comments to indicate that there is a partial computerized system in place now which only helps him during the discharge of his duties as a recorder to identify folders for the doctor to work on.
“Yes! There is a partial computerised system” (Efo, Recorder)

4.4 Perceived Benefits of EPR

Participants who had experienced EPR in varied capacities (as patients, relative to patients or health professionals) clearly identified benefits that accompany the use of EPR. The benefits identified by some of these participants were informed by their experiences. Participants who had no experiences, were also able to identify some benefits based on their varied understanding of the concept. These benefits were clearly classified by participants into two (2) main categories – Benefits to facility and health workers and Benefits to Patients. Majority of the participants were of the view that EPR enhances the productivity of health workers who use the electronic means of record keeping as well as reduces or prevents the loss of patient records, such as history from previous hospital attendance - this benefit was then expressed by a number of participants to be a major factor for ensuring continuity of care. Some participants, comparing EPR with the paper based system found it more advantageous. Access to patient information was considered by a number of the participants to become easy when EPR is adopted. Most of them did not hesitate to point out the benefit of a massive reduction in human errors considering the volume of patients that are attended to on a daily basis. Also, participants brought to light the issue of a massive reduction in the use of paper to be a major benefit of EPR since electronic means of keeping records would replace the traditional paper base of record keeping.

4.4.1 Enhances productivity

Productivity is perceived to be the outcome of a process or an activity compared to the resources employed. In this regard, participants compared the resources employed by health workers and their respective facilities, such as time and infrastructure, to the level of service delivery to patients. Most of the participants were of the view that EPR, when used, ensures fast and efficient service
delivery vis-à-vis the available resources. It was made obvious by the participants that much work could be done by health workers with the use of EPR in real time.

Most of the participants brought to bear that with the use of EPR, the time used for preparing reports is reduced drastically, leaving enough time for other clinical duties to be performed; thus ensuring the efficient use of the resource of time at the facility.

“As a nurse, let’s say, after writing the 24-hour report, you have to take it to the nursing administration for it to be read before you go home but if there were an electronic system in place, you can just forward it to them for their perusal. It will be faster!” (Hope, Mental Health Nurse)

“So…electronic system will make work faster, it will help improve outcome and also increase work productivity” (Dora, Mental Health Nurse)

“It also helps us in compiling our reports. If the thing is in our computerized system, we just can do those things fast, fast, fast. But if not, we still have to go through the manual stuff, compiling the reports as we are currently doing with what we have.” (Efo, Recorder)

“Normally in our hospitals, when we write report, we write it in a very big note book and when the night nurses come they write those reports and when they write those reports, they bring it to the administration in the morning and then when they bring it to the administration, you have to read, you have about 20 reports. You have to read the reports of all these 20 wards, what is happening to every individual patient, those who are acutely ill. Meanwhile the night nurse is still waiting there. By the time you finish reading all these things, it’s around 10 o’clock and the nurse has to go home and come back again but with this electronics, they key in their things, they write the report into the computer and they send it to the nursing administration. So whatever advice, whatever feedback you have to give them, you are able to give it to them so it helps the work move faster and then the nurses can also be relieved from some of these wasting of time coming to administration” (Lorm, Pharmacy Technician)

A few of the participants were of the view that using EPR would eliminate the use of room space or buildings for the storage of files; thus promoting the efficient use of rooms for additional wards to accommodate any increase in hospital attendance.

“So in some big, big places (hospitals), there are times that they hand over the folder which is supposed to be hospital property to the patient to take home so that they bring
later for their reviews. So it (EPR) also takes care of the space aspect that is associated with the normal folder system yeah” (Ato, Medical Doctor)

“...And then (EPR rids the need of) trying to get more space for the storing. We will no more be talking about those things.” (Kwame, Recorder)

“And even the space, where these things (paper folders) are stored, I know they have archived, they have the main records and then the consulting rooms. So you see the amount of space the folders are occupying in the consulting rooms make the consulting rooms congested. Taking away the folders will create more room for people to move about, do whatever they want to do and make life easier for a lot of people” (Ama, Mental Health Nurse)

“It (EPR) will help maintain some space in the consulting rooms because they wouldn’t have to keep folders in the consulting room anymore” (Joy, Mental Health Nurse)

Quite a number of participants held the position that, employing the use of EPR results in great savings of financial resources (money) and thereby making funds available to attend to other needs of the facility.

“...The folder system is a waste of money because you buy a lot of paper. I mean the folder is obtained – you have to buy it. So in order to cut down on cost and to be able to channel the little money that we have here to some other sector or something, we should do away with the paper...”(Ama, Mental Health Nurse)

“So, some of the benefits are, we won’t have to spend money printing physical or hard copy of the folders.” (Efo, Recorder)

Others pointed out that, health service delivery would be satisfactory to patients since the use of EPR would reduce their waiting time at the hospital.

“So it will be a lot beneficial and the patients will also feel happy because they can go through the consultation very quickly and go back home to do other works. As at now, you go to the hospital and practically, a patient needs to devote the whole day to just attend to something that required just only not more than 30 minutes.” (Sefa, Recorder)

“So I think that the patients will even love it (EPR). They won’t stay long in the hospital and they will just hurry up and go home and rest if they have to go home or even go for admission.” (Lorm, Pharmacy Technician)

“...Most of the things we are battling with are...long waiting time of patients – that’s the major thing. When someone has to wait for a long time, they get frustrated and all those things. If you are not careful, patients will not attend the facility again because I mean
what’s the point in coming to wait but this thing (EPR) is going to check it and we know that one reason why patients are delayed is because of poor record keeping. So if you have this electronic way of helping patients or providing service I think it’s going to quicken their time they use at the OPD or the time they spend in the facility.” (Dela, Mental Health Nurse)

4.4.2 Reduces or Prevents loss of records

With the facility’s current paper based record system, the probability of loss of records through various means such as fire, flood, misfiling is very high. This loss of vital patient records have grave negative effects on the patients and the health workers. As such, a great number of the participants were of the view that, using EPR will prevent the loss of patients’ records and its associated effects.

“Since handling folders will be a thing of the past, it will be more advantageous to us because when our patients get aggressive, they sometimes tear folders or pour water on folders and other stationery” (Joy, Mental Health Nurse)

“...And then let me say, the issue of misplacing folders will be a thing of the past (when EPR is implemented) ... (Kwame, Recorder)

“And then it will also help us to have adequate record keeping of patients so it doesn’t matter whether you (the patient) were here (at the facility) in the year 1995. If let’s say we had record keeping electronically since 1995, we could just retrieve it because you have a software that is keeping it. It will be easy to retrieve as compared to now because for example I mean there could be fire, there could be flood or anything and then everything (record) is razed down by fire or something, how do you retrieve it but if you have a software ... we could retrieve it anytime even if you have lights out ...., it could be retrieved anytime and you don’t have just one central point of keeping it – it’s on the computer...It’s going to cut down on misplaced documents or file.” (Dela, Mental Health Nurse)

“Electronic system... helps with records keeping because a folder system was such that information could easily get lost ... some of the sheets can get torn, even the entire folder can get missing, in case of fire outbreak”. (Ato, Medical Doctor)

One participant added that EPR would promote the confidentiality of patient’s information as information would be securely kept on the computer and only accessed by the relevant health worker.
“It would improve upon patient confidentiality, because leaving folders all over the place, people get access to it, people who are not supposed to but if you are able to key it into a computer, you can even lock it with a password. And if someone is not supposed to look at some information then they don’t come across it.” *(Ama, Mental Health Nurse)*

### 4.4.3. Continuity of care

Most of the participants pointed out that, when a patient loses his or her index card, it becomes practically impossible to locate the patient’s folder. In such cases a temporary folder is created to enable the prescriber attend to the patient. However, the temporary folder does not have the medical history of the patient and, as such, could affect the provision of the needed medical care. These participants explained further that, with the use of EPR, this situation would be avoided, his details could be accessed electronically by the prescriber; thereby ensuring the continuity of care provision by same.

“*It’s going to help in continuity of care*” *(Dela, Mental Health Nurse)*

“Then losing information and all that wouldn’t come in again. For instance, we will be able to trace the treatment plan of a patient over a very long period of time and what works and what doesn’t work rather than the patient coming in today, his folder cannot be found, somebody is trying something new, not knowing what was the previous treatment that was given.” *(Ama, Mental Health Nurse)*

“*It will also improve continuity of care because, for instance, one doctor attended to a patient on a previous visit but is not available on patient’s review day. By just one click of a button, by another doctor, he would be able to get a comprehensive detail of all the care activities done on the patient and then continue from there*” *(Hope, Mental Health Nurse)*

Continuity of care was deemed possible, not only in the consulting room but also, after the discharge of patients from the hospital by community psychiatric nurses via the use of EPR, which allows the transfer of patient’s medical history and other demographic data, such as place of residence, to these nurses in the various communities.

“*...The electronic thing (EPR) is very useful ...it will be easy... to create a network between the various communities, as in where we have community psychiatric nurses working because there are times when you discharge a patient, you would wish that the...*"
community psychiatric nurse would seriously follow up with this patient and make sure that this patient is taking her medication... so that the patient can continue care.” (Eyram, Mental Health Nurse)

4.4.4 Relative advantage over the paper system

In the identification of the benefits of EPR system by all participants, they brought to bear its relative advantages over the paper based system, which was the main system of record keeping at the APH (i.e. after comparing both).

“And I think this innovation is much better than the paper system...” (Dora, Mental Health Nurse)

“I would say it (EPR) is a better system of keeping patient information... (Hope, Mental Health Nurse)

“...Electronic (EPR is better) because it will improve my work, it will reduce relapses in my patients, the wards are going to get less congested...” (Hope, Mental Health Nurse)

These relative advantages include avoiding wastage of time, easy access to data and data security, continuity of care, reduced storage space, amongst others.

“Oh, I think the electronic system is much faster and efficient...comparing it to the paper system...” (Dora, Mental Health Nurse)

“...In a scenario when a patient loses his hospital card, some patients will just stay home and not come for review because they are somewhat aware of the hassle they will go through looking for their folder...But in a situation where patients know they will still be easily taken care of despite missing their hospital cards poses no hindrance for them to seek care...because he knows his medical information can be retrieved at the click of a button” (Dora, Mental Health Nurse)

“Sometimes too, the folder may be in the doctor’s office and nurses might be in need of it on the ward...because the folder can only be at one place at a time. But with an electronic system, you can access patient information from anywhere and it makes work easy” (Hope, Mental Health Nurse)

4.4.5 Easy access to information

Access to patients’ information at all levels or stages of the health delivery process - from the reception to the discharge of an in-patient – was demonstrated by the participants to be a main
benefit that accompany the use of EPR, either for reporting purposes (non-clinical uses) or for clinical uses.

“...It (EPR) will also help the doctors to have access to patient information anytime they want. They can just sit back with their computer and they just know (access patient information)” (Ese, Recorder)

“...It (EPR) will make documentation safe and easy to access” (Dora, Mental Health Nurse)

“Flow of information will be much easy and readily accessible (with the use of EPR)” (Joy, Mental Health Nurse)

“(EPR) makes patients information readily accessible” (Akos, Mental Health Nurse)

“I would say it (EPR) is a better system of keeping patient information because... it will enhance... easy access to patient information.” (Hope, Mental Health Nurse)

“It will be easy to trace information because it will just be a click away” (Eyram, Mental Health Nurse)

Some did not hesitate to add that the information accessed using the EPR system would be accurate.

“One, data efficiency. It will be more efficient. You will be able to get more accurate information. You'll be able to get real time information – when you need the information, you generate it... At the click of a button, you can get the data. So greater efficiency, more accuracy...” (Sefa, Recorder)

“...I think it (EPR) will help to keep accurate data of the in-patient and out-patients in this hospital...” (Dora, Mental Health Nurse)

A few of the participants were of the view that the benefit of easy access to information under the use of EPR would go a long way to enhance research work into the improvement of health delivery systems.

“...I think it (EPR) will help to keep accurate data of the in-patient and out-patients in this hospital for example the total number of patients, number of males from females, the number of diagnosis for say schizophrenia in a month or year, number of new cases from old ones and all those statistics. This information ... be readily available for researchers
because as it stands now, mental health information is really hard to come by in Ghana” (Dora, Mental Health Nurse)

“Oh! In terms of research, it is easier for the facility because…now everything is in the computer and so you just go in and cumulate say number of schizophrenic in this month, or which month had the highest figure for clinic attendance and you can quickly get that out or which prescriber didn’t report to duty and it’s easier to pull it out rather than going to look through books and records and folders all over again. So it makes research easier. So…the facility stands to gain…” (Ato, Medical Doctor)

Very few of the participants agreed that the use of EPR, since it gives easy access to information for research, would go a long way to influence policy making at all levels.

“…I think it (EPR) will help to keep accurate data of the in-patient and out-patients in this hospital for example the total number of patients, number of males from females, the number of diagnosis for say schizophrenia in a month or year, number of new case from old ones and all those statistics. This information will inform management on their action plans, policies, etc…” (Dora, Mental Health Nurse)

“…In the same light as in data collection, because after it is collected, you can always collate it at the national level to get some meaningful data for the nation. Because as it stands now, most of the available data cannot be trusted. So it will help in better…sampling of data for national use, for planning and as a guide for policy makers.” (Ato, Medical Doctor)

4.4.6 Reduced human error

Virtually all the participants, having identified the massive human involvement in the paper based system and subsequently attributing most of the challenges of this system to human errors, were of the view that EPR, would do away with human involvement, to some extent and thereby reduce the associated errors in record keeping. These human errors were described by a few participants to include misfiling, misplacing of files and poor handling of files.

“…We are humans, the person just mistakenly misfiles it and put it in a column that has like let’s say 2-2 instead of 1-2” (Dela, Mental Health Nurse)

“…So if there’s some water spillage…part of the document (paper folder) is destroyed. …due to human error, you might have somebody shelving a particular folder somewhere, they later go looking for it, they don’t find it. …and at times, it’s about error when they are filing and some get totally lost…and you don’t see them again” (Ama, Mental Health Nurse)
A participant, therefore, was of the opinion that, EPR would ensure that these human errors are done away with to ensure the security of patients’ information.

“...The issue of misplacing folders will be a thing of the past (when EPR is implemented) ... (Kwame, Recorder)

4.4.7 Reduction of paper use

The paper based system of record keeping is characterized by the use of paper and pen to save patient’s information. EPR, however, seeks to do away with the use of paper and rather use computers as the mode of patient’s information storage. With this, the use of paper in facilities that have adopted EPR, would see drastic decrement.

“The benefits... will be to convert manual paper work into the electronic system, which is obviously more efficient” (Sefa, Recorder)

“...Basically, we are going folderless or cardless,...everything will be done electronically, you are not going to be holding folders,... prescription sheets,...lab request form... Everything is going to be put on the computer. (Dela, Mental Health Nurse)

“...It (EPR) will reduce... paperwork... (Lorm, Pharmacy Technician)

One of the participants, identified this advantage and further added that, the reduction in the use of paper would also reduce the associated risk of loss of information on paper through tearing or wetting with water by aggressive patients.

“Since handling folders will be a thing of the past, it will be more advantageous to us because when our patients get aggressive they sometimes tear folders or pour water on folders and other stationery. This will be no more since records are stored electronically.” (Joy, Mental Health Nurse)

Another also added that, the associated cost of the use of paper, including the cost of printing folders, lab request forms and prescription forms would also reduce with the implementation of EPR.
“...We won’t have to spend money printing physical or hard copy of the folders.” (Efo, Recorder)

In the writing of daily reports, this perceived benefit would come to bear, as there will be no more the need to do so in notebooks; hence less use of paper.

“...when we write report, we write it in a very big note book...but with this electronics (EPR)...they write the report into the computer...” (Eva, Mental Health Nurse)

4.5 Perceived barriers of EPR

Participants were able to identify potential barriers or challenges that could impede the successful commencement and continuity of the use of EPR. Most of the participants were of the view that since EPR is an expensive venture and thus very capital intensive, funding it would be one of its major barriers. The absence of a reliable internet access or connectivity was also pointed out by some participants to be another challenge to the EPR. Another challenge or barrier identified by most of the participants was the willingness on the part of health workers to accept its introduction. Considering the importance of one’s knowledge in the use of computer, a number of the participants revealed that the level of health workers’ computer literacy can be a major barrier to EPR while some also identified the unstable power (electricity) supply as a critical barrier to EPR. A number of the participants mentioned that the absence of a good and routine maintenance of the various machines or gadgets in the EPR system could adversely affect the continuous operation of the system and frustrate it. The difficulty in transferring patient information obtained under the paper based system to EPR was also brought to light by a few participants during the assessment of the barriers to EPR.

4.5.1 Funding

Majority of the participants commented that implementing EPR would be an extremely expensive venture in terms of the initial cost of the acquisition of computers, the recording software and the
space to house the computers as well as the cost of maintaining the system, training of health professionals to use the system and providing alternative source of electricity in order to achieve its full benefits.

“... (EPR) expensive too. This electronic thing is expensive...” (Lorm, Pharmacy Technician)

“(EPR) will require quite a lot of financial input” (Kwesi, Psychiatrist)

“The major thing is funds and money needed to buy the machines. I’m sure that’s the major challenge.” (Kwame, Recorder)

“And of course also...to have the financial resources to be able to... buy the software and ...to obtain the infrastructure” (Sefa, Recorder)

“The cost involved for the initial purchase of the software...the cost of maintenance... The main challenge will be funding and acquiring an appropriate space” (Joy, Mental Health Nurse)

“...The ability of the facility to purchase the computers and maintain them...” (Ama, Mental Health Nurse)

“...The initial cost in starting this...electronic thing (EPR) is huge. Buying the software is huge money and so is acquiring computers...space for the computers...” (Ato, Medical Doctor)

“...We need a lot of money to make sure that the computers are distributed at the key places...” (Eva, Mental Health Nurse)

4.5.2 Internet Connectivity

A few participants identified that a poor or no internet connectivity would hamper the use of EPR as it will be impossible to transfer information from one point of the delivery chain to the other. A jammed-up internet connectivity was mentioned to imply the halting of the delivery process and keeping patients waiting until it is restored before they could proceed to the next stage.

“... The only problem (of EPR) is the networking (network, local network). If the network jams, it slows down things and move back go to phase 1 again...” (Lorm, Pharmacy Technician)
“Also, poor internet connectivity will be a major challenge (of EPR) because...to be able to share information between departments, we will need the internet. So in case where connectivity is poor, that means there will be no work...” (Dora, Mental Health Nurse)

“...If the networking system is not reliable, we will have a lot of challenges (of EPR) ...” (Joy, Mental Health Nurse)

“...We don’t have network system,...so even if the computer comes and they don’t install a reliable internet facility, we still can’t perform what we want to do (use EPR)” (Kwame, Recorder)

The effect of a poor internet connectivity on the use of EPR was experienced by one of the participants, while accessing health services at another facility. This is an expression of the poor or no internet connectivity as a challenge to EPR.

“...It (EPR is) ok but at a point in time their network got jammed so we had to wait for a while... we were asked to wait for a while for the doctor to receive our information before we were informed again that we could now go in and see the doctor” (Joy, Mental Health Nurse)

4.5.3 Resistance to change

Another perceived barrier or challenge to EPR was identified by a good number of participants as the resistance to change by health professional workers. This is where health workers kick against the implementation of EPR for varied reasons.

“...The willingness too of the staff (is a challenge to EPR) because some like this manual thing (paper based system) than electronics (EPR)” (Lorm, Pharmacy Technician)

“People are going to resist (EPR)...People resist change...That’s the main challenge, there’s going to be resistance” (Eyram, Mental Health Nurse)

“... I think there are people who would...not be happy with this kind of change (to EPR). Some people are going to have apathy to this kind of change (to EPR) and they wouldn’t want to do it” (Dela, Mental Health Nurse)

“...Staff who are unwilling to adopt the new technology (EPR) will pose as a challenge because they will be like draw backs.” (Dora, Mental Health Nurse)

“...Change is difficult...” (Hope, Mental Health Nurse)
“…People who are very ignorant about how easy it would be will kick against it (EPR). So the very people we are trying to make life easier for, ....may kick against it… we will have a lot of resistance...” (Ama, Mental Health Nurse)

4.5.4 Computer illiteracy

Another barrier that was perceived by most participants is the issue of computer illiteracy. This stemmed from the reason that EPR mainly has to do with the use of computer to store, modify and access patients’ information and one’s inability to use the computer would gravely hamper the effective use of EPR. This barrier became apparent when participants considered the current constitution of the workforce at the facility, which includes a number of professionals who have little or no knowledge in the use of the computer.

“...We have a lot of senior nurses who did not study ICT... The barriers? Illiteracy! Computer illiteracy! If people are not literate, honestly, it will be very difficult (to implement EPR)” (Dela, Mental Health Nurse)

“The first thing on the list will be people who are not well vexed in the use of computers will have a big challenge. We have staff of various ages…who don’t even know how to boot a computer” (Ama, Mental Health Nurse)

“Not many people are computer literate... Not many clinicians are computer literate” (Kwesi, Psychiatrist)

“We don’t know about the doctors, how they know about computers... this issue of lack of knowledge might be a problem (to EPR)” (Kwame, Recorder)

One participant further explained that with one’s lack of adequate ability to use of computer, that includes typing, the entering of patient’s information by prescribers may take more hours and therefore increase the waiting time of patients.

“Yes! Slow typing!...the main problem has to do with typing the information...you have to type everything...you might lose our patients ...because of increased waiting time...”(Ato, Medical Doctor)
4.5.5 Unstable power supply

A number of the participants were able to identify the challenge that will be posed by unstable electricity power supply in the use of EPR since it involves the use of computer. This was identified as a major barrier in the wake of the recent energy crisis experienced by Ghana, termed as “Dumsor” (vernacular for unstable power supply). Unstable supply of power was identified to interfere with health care delivery where EPR is used.

“Energy crisis thus power fluctuation. When the lights go off, it will interfere with work” (Akos, Mental Health Nurse)

“...Power outages. As at now, we still encounter the power outages... So they will be the major challenges...” (Kwame, Recorder)

“Another thing (barrier) is if we are going to be having dumsor dumsor (vernacular for unstable power supply) – really – what’s the point?” (Dela, Mental Health Nurse)

“Dumsor (vernacular for unstable power supply) will be a big challenge (to EPR) because that means if there’s no power, there’s no work. So...it (EPR would) rather stale work.” (Hope, Mental Health Nurse)

“...And then power supply, as to whether we would have constant power supply here to keep the gadgets running because, we are not fortunate when it comes to consistent power supply” (Ama, Mental Health Nurse)

One participant was able to explain further that unstable power supply could damage the various electrical gadgets that form part of the EPR system.

“So, yes! The electronic system comes with a huge challenge when it comes to the recent power outages... It (unstable power supply) could spoil a lot of our electronic gadgets...” (Ato, Medical Doctor)

4.5.6 Lack of maintenance

Since EPR pivots on the use of computer and accessories as well as other electronic gadgets, it became obvious that these would need routine maintenance or servicing to ensure their efficiency and to prevent them from completely breaking down. As such, failure to carry out routine maintenance of these machines, as well as their repair, should they break down, was vetted as a
major challenge by a number of participants. This was a great concern considering the poor maintenance culture experienced in the country.

“Another major thing I foresee is the ability of the facility to purchase the computers and maintain them that will be a bigger challenge (to EPR)” (Ama, Mental Health Nurse)

“...We need...to service it (computer). When we see that they are going bad, we have to service it because if we don’t service it, we can’t have the computer intact... If we don’t service them, they’ll all break down... (Eva, Mental Health Nurse)

“...A big challenge (to EPR is)... lack of maintenance (which)... is an issue for us as a country.” (Hope, Mental Health Nurse)

One participant brought to light that these electrical gadgets getting missing through pilfering could also be a major barrier or challenge to EPR. This is because, a missing computer mouse would greatly impede the smooth use of EPR in the service delivery to patients. Ensuring that electronic gadgets in the EPR system are always available is critical to its success.

“One other challenge (to EPR) I foresee is some of the appliances getting missing...the mouse, the keyboards... if that happens, you can’t use the computer without... a keyboard” (Ato, Medical Doctor)

4.5.7 Data transfer to EPR

Another challenge identified by a few of the participants is how difficult it would be to transfer, by typing, existing patients’ history or information from the paper into the electronic system.

“...It will be very challenging because we would have to move all the patients’ information into the computer. We can’t ignore that fact and it will very hectic! It will be very hectic!” (Ese, Recorder)

“And...you need...to migrate the data you have onto this system (EPR)....” (Sefa, Recorder)

“...For a start, we will have bulky records to transfer into an electronic system. That may seem forever and may even be a setback because it will take a lot of time and we may need extra hands...It will be a lot of work” (Dora, Mental Health Nurse)
There stands the risk of losing valuable existing patient information if not migrated onto the new EPR in an attempt to evade this challenge. This would not ensure the perceived benefit of continuity of care.

“I think for a start, we may lose a lot of valuable data if we are migrating without the previous data. Say, we are just starting fresh with the electronic system and nobody has really sat down to key in the old information in the folders...so we are losing patients records...” (Ato, Medical Doctor)

4.6 Mitigating perceived barriers

Having identified the perceived barriers of EPR, participants proceeded to suggest means to mitigate these barriers to ensure that the perceived benefits of EPR would be fully realized. These include accessing a sustainable source of funding to ensure that funds are made available to cater for the initial cost of establishing the system as well as to cater for the cost of keeping it running after introduction. Most of the participants suggested this means of mitigating the barrier of funding. Participants also recommended avenues of ensuring the reliable presence of internet connections at the facilities using EPR. Means of handling the potential resistance from staff towards the introduction of EPR were also brought to light by some participants while others proposed solutions to ensuring that health workers are brought to speed with an appreciable level of computer literacy to aid their smooth use of EPR. There were also a number of recommendations on how to combat the perceived barrier of unstable power supply when EPR is adopted and implemented. Some participants also tackled the issue of lack of maintenance and suggested measures that could be in place so as to ensure routine maintenance of all the electrical and electronic gadgets that form part of an efficient EPR system. There was, however, little attention given by participants to making suggestions for overcoming the difficulty in transfer of data from the paper folders to the computers. There were, however, solutions suggested by a few participants.
4.6.1 Sustainable source of funding

A good number of participants proposed means of ensuring that there is availability of funds to kick start the EPR system and constant availability of funds to keep it running afterwards. Indications are that, the APH is currently directing its scarce financial resources to providing meals and medication to patients and as such, that leaves almost nothing for allocation towards implementing the EPR systems. Some of the identified sustainable sources of funding were mentioned as sponsorship from Non-Governmental Organizations (NGOs), philanthropists, willing individuals, corporate organizations, the government, amongst others.

“...They can contact the ministry of health for assistance or talk to NGOs and other agencies for sponsorship. Philanthropists and willing individuals could help... and the mental health authority” (Joy, Mental Health Nurse)

“...If we can get organizations, NGOs or other corporate organizations coming to our aid to ....donate computers or help us even establish an ICT department for the hospital.” (Dela, Mental Health Nurse)

“...We will need a lot of sponsorships...to get this done.” (Dora, Mental Health Nurse)

“The government should be willing to fund the project. They should be willing to pump in money enough to buy computers for all the units (of the facility).” (Ama, Mental Health Nurse)

One of the participants demonstrated that plans are already being implemented by APH to obtain the needed sustainable funding source or mechanism to commence the use of EPR at the facility.

“We are trying to work out, on a bigger note, a funding mechanism. If we are able to get that funding mechanism in place,.... then we will have money to do everything, including this (EPR)... ”(Sefa, Recorder)

4.6.2 Reliable internet connectivity

A few participants attempted to propose a solution to the perceive barrier of internet connectivity. These ranged from getting a reliable service to qualified personnel to resolving any hitches that may affect the connectivity.
“Moving on, we will need strong internet connection...” (Dora, Mental Health Nurse)

“...We have to have well qualified personnel around ... so that should anybody face any this this (problem), you can just call on the person to attend to (it)....” (Lorm, Pharmacy Technician)

One participant was of the view that the savings that accompany EPR from the elimination of the printing of folders, amongst others, could be channelled into financing an internet system at the facility. This suggests that the implementation of the EPR system in itself can help ensure that funds are available to avoid the barrier of poor internet connectivity.

“...All that money would be used for buying credits for...the Wi-Fi” (Kwame, Recorder)

4.6.3 Willing workforce

Even though participants had earlier on commented that EPR stands the risk of being resisted by health workers during its implementation, they were able to identify factors that could lessen its occurrence. The identified mitigating factors include educating every worker on the benefits of EPR and reasons for its adoption, involving all relevant stakeholders and encouraging or motivating staff to start using the EPR system and continue doing so, even in the face of difficulties in the system.

“I think we would need a change of attitude. First of all, psyche the minds of the staff that this (EPR) is what we have to do and let them know the importance of introducing this method EPR) so that they will not show any level of resistance.” (Eyram, Mental Health Nurse)

“If you want to solve this...they will have to go to the grass roots. If I say grass roots, every member, every staff, who in one way or the other have something to do with patient records have to be trained and know the relevance of the programme so that they will not miss it... Well if they involve every person, like... focus group discussion, stakeholder’s participation” (Efo, Recorder)

“Intense education on the benefits of EPR; thus its advantage over the traditional paper base” (Akos, Mental Health Nurse)
“...because some, they like this manual thing than electronics...motivation should be high.” (Lorm, Pharmacy Technician)

One participant was of the view that, since most of the staff use smart phones, staff, who otherwise would resist EPR on grounds of difficulty in use, would easily accept the system when they are made to understand that its use is not any much different from using smart phones.

“...I think when people get to understand it... knowing that they’ve been using smart phones, I think they will embrace it...” (Dela, Mental Health Nurse)

4.6.4 Improving computer literacy

Majority of the participants also highlighted a few means to help improve the knowledge of staff so as not to be found wanting while using the EPR system. The main avenue identified was the training of staff to increase their level of knowledge in the field of computer both before and after the implementation of EPR.

“...Training! Lots and lots of training sessions” (Ama, Mental Health Nurse)

“Training staff and making sure that everyone that is all the wards, units, departments and administration has a grasp of the interphase...” (Joy, Mental Health Nurse)

“I think there should be training in ICT as well for the staff” (Hope, Mental Health Nurse)

“...When they supply the computers, the laptops... they should train staff as to how they should use the computer,...they should train them as to how they should use it (EPR)” (Eyram, Mental Health Nurse)

“...Well trained staff...” (Dora, Mental Health Nurse)

“If they can at least provide maybe tutorials or ...little lecture to everybody, the doctors, every department. This is the system (EPR) that they are going to implement and the system is going to be electronic so everybody has to be equipped with that knowledge. So at least, a little lecture or tutorials or orientation so that we would have a fair knowledge about the process” (Kwame, Recorder)

“You ...need the software developer to organize various seminars and orientations for the staff.” (Lorm, Pharmacy Technician)
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“Having to train all health and non-health personnel in the use of EPR” (Akos, Mental Health Nurse)

In addition to the facility having an organized training structure for its staff to equip them with the necessary knowledge in the use of computer and the EPR system, it was advocated by one participant to encourage staff to personally do more practice on the computer by obtaining their personal computers or visiting commercial ICT setups or cafes.

“Training!... and then practice. People can be encouraged to visit the internet cafes or get personal laptops and then be using it at home or maybe they can visit the internet and be practicing to just perfect whatever ... they have acquired.” (Dela, Mental Health Nurse).

4.6.5 Sustainable energy supply

Recommendations were also made by some participants on ways to curtail the barrier of unstable supply of electrical power which is potentially able to plague the implementation of EPR. The main avenue that was identified by the participants was to obtain an alternative source of power.

“... I think they make provisions...for a (generator) plant or external source of power should the main power fail” (Hope, Mental Health Nurse)

“I think aside the computers ...we will need ... universal power storage (UPS) that would hold up if...the light is gone. Because if we have UPS, lights out wouldn’t shut down the computer. It will at least hold it for a while before the generator would be put on...” (Ese, Recorder)

“...We could get another (generator) plant as well or we could be assured of regular or uninterrupted supply of electricity ...from our providers...” (Dela, Mental Health Nurse)

“Moving on...constant power supply...” (Dora, Mental Health Nurse)

Another participant clearly expected the government to take it upon itself to provide a solution to this barrier.

“The government ...should be able to provide us with some sort of alternative power when we don’t have the main line functioning” (Ama, Mental Health Nurse)
4.6.6 Routine maintenance

In order to avoid the breaking down of the computers and other electronic gadgets, which would in turn impede the smooth operation of the EPR system, a few participants recommended that there should be provision for routine maintenance to be carried out by qualified personnel. The identified resource in ensuring this is qualified personnel.

“So I think the way forward is that...we should make sure that we have people that whenever it is time for servicing, they will come and service the computers. We are not going to wait and the computers will stop working... We should put people in place who will be servicing it for us from time to time so that they don’t go bad...” (Eva, Mental Health Nurse)

“...We have to have well qualified personnel around...so that should anyone face (any IT challenge) you can just call on the person to attend to (it)...” (Lorm, Pharmacy Technician)

“...I think they must make provisions for maintenance...” (Hope, Mental Health Nurse)

4.6.7 Data entry clerks

In addressing the potential problem of difficulty in data transfer with its potential of losing vital patients information, very few participants made suggestions with respect to same. One was of the view that management would have to make a choice between ignoring existing patient information in the old folders and treating subsequent cases as new in the EPR on one hand and to transfer existing patient information into the EPR system on the other hand.

“Unless we decide to ignore the old folders and start afresh...I don’t know what management will decide. Or they can decide to input all the old information first before the rest of the staff is allowed to use it” (Dora, Mental Health Nurse)

Should management decide to transfer existing patient information into the EPR system, the recommendation of employing additional staff was brought to bare by one participant. The role of these clerks was also extended to include transfer of data gathered from patients’ new visits even after introducing EPR.
“...We can get data entry clerks... so they can be trained to help enter the data so that at the end of the day, they will take all the patients who have been attended to and enter the data in the computer.” (Ato, Medical Doctor)

4.7 Dissatisfaction with Paper Records

This theme did not contribute to any of the set objectives for this study but it has been included because it was consistent with majority of the participants.

The participants, having the paper based system as their current means of keeping records, expressed dissatisfaction with this system. They enumerated the numerous disadvantages that go hand-in-hand with the paper based system and indicated their dissatisfaction with the system. Dissatisfaction was expressed by most of the participants with respect to paper records getting missing through staff misfiling the folders, which contain these records; the loss of part of or the entire folder; physical damage to the folders; and the loss of patient’s identity cards thereby making it extremely difficult to trace their folders. In the case where a patient’s folder cannot be traced due to the above identified factors that lead to the loss of or difficulty in tracing patients’ folders, the workers are compelled to create a temporary folder (an alternative means) so as to give the needed medical care at the time of patient’s visit. This could happen on a number of occasions for a particular patient; thereby leading to the duplication of his records; this was observed to be dissatisfying to the participants. Another area where a number of participants expressed their dissatisfaction had to do with the needed space required to store these paper folders when not in use considering their huge volume as well as the limited available space at the facility. The paper based system was also dissatisfying to some of the participants since it inconveniences and frustrates both health workers and patients. The system also generates inaccurate statistics or data which would not be reliable for any research purposes.
4.7.1 Missing Records

The missing of paper records or difficulty experienced in locating paper folders was narrated as a common phenomenon in the paper based system of record keeping by most of the participants. Four different causes of this problem were identified by the participants, who did not hesitate in expressing their dissatisfaction with the system as well. The first means identified include the misfiling of the folders, where files are wrongly filed at sections on the shelves in the records department. The mode of labelling used was indicated as numerical and misfiling occurs when numbers are misconstrued due to illegibility of the written numbers.

“It’s a bit challenging when you file and the next time…it’s probably not there because another person came to take it and didn’t put it where it is supposed to be kept…” (Ese, Recorder)

“…One thing is that because it’s not computerized, it (filing) is done manually by people, sometimes you mistakenly misfile a folder …we are humans, the person just mistakenly misfiles it and put it in a column that has …2-2 instead of 1-2. That’s going to be a big challenge…” (Dela, Mental Health Nurse)

“So, the main challenge is that we misfile folders (and) when you are going to retrieve the next time, you don’t find it easy.” (Kwame, Recorder)

“…Other times, the folders are misfiled and it becomes an issue when it is needed.” (Hope, Mental Health Nurse)

The second identified means in which records get missing is when part or the entire folder cannot be found.

“Other times, some folders will even be missing…Most unfortunate is when patients come for review and their folders cannot be found.” (Dora, Mental Health Nurse)

“Also, some parts of folders remove or get torn and information gets lost.” (Joy, Mental Health Nurse)

“…A folder system was such that information could easily get lost…some of the sheets can get torn, even the entire folder can get missing…” (Ato, Medical Doctor)
Physical damage to the folders through external means was also identified by a few participants as the causes of missing records under the paper record system. This could occur when an aggressive mental patient tears the folder destroying the records contained therein.

“There are times you have a patient pick up folder and actually tears it in front of you.” (Ama, Mental Health Nurse)

Physical damaged could also arise from attacks by insects, water spillage, fire outbreak and the operation of other element of destruction.

“...The manual storage system is at the mercy of the elements, ants ...some may be eaten, rains...” (Sefa, Recorder)

“And recently, there was a fire outbreak ... if we don’t have other means of keeping the records apart from this manual system, it means that once the folder is burnt, that is it! We lose all the data! We lose everything! (Eyram, Mental Health Nurse)

“...A folder system was such that information could easily get lost...in case of fire outbreak” (Ato, Medical Doctor)

The fourth avenue through which patients’ information could be lost was deemed to result when a patient misplaces his or her identity or reference card, which has the primary role of providing the records department with the identity numbers of folders for ease of retrieval. In such a circumstance, there will be no practical means of tracing the folders among the many stacks of paper folders in the record department.

“The most challenging aspect of the work is that, you do your best recording all these stuffs, you give the client his or her part to bring reference card so that the next time, you don’t hassle to get a folder. They come without the card.” (Efo, Recorder)

“...One thing, if a patient loses their card...then the nurse is not able to readily retrieve it (the folder)...” (Dela, Mental Health Nurse)

4.7.2 Duplication

Two of the participants were greatly dissatisfied with the duplication of patient’s information, which results when due to the loss or damage of the paper folders, nurses are compelled to create
a “Temporary Folder” so that the patient could be attended to. The temporary folder is to be merged into the main folder, when it is later found. However, this is not always the case as the main folders are not always found. Since the temporary folder is not numbered, it is more susceptible to get missing and this may result in the creation of several temporary folders for a particular patient. This phenomenon is very dissatisfying to these participants.

“...You prepare... a temporary folder... Another time, there’s a new one prepared, another time, another one prepared and by the time you realize, there’s one patient who has different temporary folders flying about” (Dela, Mental Health Nurse)

Alternatively, where a patient has financial means, he could pay to be registered all over again and issued another folder with its number. When this occurs, there would be duplication of his information.

“...And they still can’t find the folder, then...the patient has to pay another amount of money for another folder to be issued for him.” (Eyram, Mental Health Nurse)

4.7.3 Limited storage space

Another sphere where participants expressed dissatisfaction with the paper record system was in respect of the reason that this system requires large storage space, which unfortunately is mostly limited.

“...Here (the records department) is almost filled up and if we should give ourselves like 10 years, 20 years then, probably the place will be eating us up.” (Ese, Recorder)

“...You need a lot of a huge storage facility,... if you’re not able to keep all the records there because it’s so many, then eventually some will get lost.” (Sefa, Recorder)

“...We didn’t have storage space for some of the folders as well.”(Ato, Medical Doctor)

“....The space for us to be keeping the folders... is choked up.” (Kwame, Recorder)
4.7.4 Inconveniencing to patients and staff

Another dissatisfying characteristic of the paper record system is that it greatly inconveniences both patients and staff in that it is cumbersome, user unfriendly, wastes time and frustrating to patients.

“...It’s (the paper based system) also quite tedious...it’s not user friendly to the staff themselves and it makes the patients uncomfortable because they will keep too long when they could have finished in very short time (at the facility) and gone.” (Sefa)

“You spend a lot of time (looking for folders) and the patients get angry.” (Eva, Mental Health Nurse)

“...(the paper based system is) cumbersome,... not user friendly”(Kwesi, Psychiatrist)

“There’s waste of time. When they take the records, instead of a simple click, they have to get up from their post and share the folders among doctors available before the doctor also continues...it conveniences patient and staff” (Joy, Mental Health Nurse)

4.7.5 Inaccurate data

A few participants indicated that the paper records produce inaccurate data considering the various risks it is exposed to which eventually lead to the loss of vital data.

“...And that often leads to records being lost and we need to generate the information all over. So all that does not make it accurate and ...periodically, when they are trying to collate, the data ... it may also not have been consistent so it becomes difficult to reconcile to get the data right and when you’re interpreting, it also becomes a problem.” (Sefa, Recorder)

“... (the paper records are) not accurate...” (Kwesi, Psychiatrist)

“So, one, information is lost,...it adds to the statistics making it inaccurate” (Joy, Mental Health Nurse)

4.8 Summary

In summary, this chapter presents the findings of the study and also sets the foundation for discussions in the next chapter in relation to reviewed literature. A total of five (5) major themes and thirty-two (32) sub-themes were covered in this chapter. The study revealed that participants had some level of knowledge of what they perceived EPR to be. They demonstrated knowledge in
terms of their awareness of EPR, their understanding of the concept, the content of their knowledge of EPR, their experiences with EPR, general attitude towards EPR and their level of computer literacy.

On the one hand, participants, whether with any experience or without any experience, were of the view that EPR comes with benefits to the facility, health professionals as well as to patients. The identified perceived benefits include the enhancement of the productivity of health workers, where resources such as time are used efficiently and the reduction or prevention of the loss of patient records. There is also the promotion of continuity of care delivery; the relative advantage over the paper based system; easy access to patient information, which also ensures the availability of reliable data for research purposes and also influences policy making. Most participants also named the benefits of ensuring a massive reduction in human errors and a massive reduction in the use of paper and its associated cost.

On the other hand, participants made it clear that EPR can also be plagued by certain barriers which could hamper its introduction and subsequent use after introduction. The identified potential barriers were the issue of funding; unreliable internet connectivity; staff’s resistance or reluctance to accept EPR; level of computer literacy; unreliable source of electricity power; lack of or poor maintenance of electronic machines; and the difficulty in transferring data from paper to EPR.

Recommendations were then made by participants to resolve these potential barriers. These comprised obtaining a sustainable source of funding to ensure that funds are available, not only at inception but also, throughout the operational period of the system; obtaining a secured and reliable internet connection; motivate staff to willingly accept the EPR to reduce the tendency of resistance from staff; education and encouragement of staff to help improve their knowledge in the use of
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computer; obtaining a more reliable source of electricity supply to serve as an alternative to the national grid; ensuring frequent servicing of machines to be used in the EPR system to prevent breakdown; and getting management to decide on whether to transfer paper records into the electronic software or keep them in paper but only electronically enter records of subsequent visits.

Lastly, paper records received massive votes of dissatisfaction by the participants in terms of records being susceptible to getting lost through various means such as physical damage and misfiling. They were also dissatisfied with the duplication of patients’ folders that is necessitated by the loss of existing paper folders in order to give the required medical care to patients; the need for huge storage space; the inconveniences experienced by both patients and staff waiting for their folders and looking for paper folders respectively; and the inaccurate data generated by the paper based records system.
CHAPTER FIVE

DISCUSSION OF FINDINGS

5.0 Introduction

This section of the study will focus on discussing the main findings in relation to previous studies, to determine the extent to which this study compares to studies that have been conducted previously. It concentrates on the objectives of the study, the findings that were discovered in the study and interspersed with Rogers Diffusion of Innovation Theory.

5.1 Knowledge of mental health professionals on EPR.

The first objective of the study sought to explore the knowledge of mental health professionals on EPR. The success of EPR in mental health care delivery depends on many factors including adequate knowledge and understanding of the concept. The findings show that health professionals have knowledge of EPR. This is justified through their awareness of the concept (EPR), understanding of the concept, the content of their knowledge on EPR, their experiences with EPR as well as their general attitude towards EPR and computer usage. This finding supports the findings of some prior researchers such as Bello et al. (2004), Bouamrane and Mair, (2013) and Häyrinen et al. (2008). Indicating that the knowledge of EPR is not restricted to a handful of pioneers alone but it is a technology known to mental health professionals as well. These current findings are also in line with the first stage of the Innovation-Decision Process (Knowledge) of Rogers theory which stipulates that people learn about the existence of an innovation and seek information about it. Most of the knowledge obtained by mental health professionals in the present study was obtained from colleagues, workshops, school or own experiences.

Inferring from the findings, it was interesting to find out that nearly all participants (14 out of 15) were aware of the concept of EPR from diverse sources as stated earlier. Some participants
however related to it with similar terms (e.g. EMR or EHR) which was quite understandable because even the literature uses a range of terms to describe the concept. Nonetheless not many participants were clear about what it entails possibly because they have never experienced or experimented with it. Some findings from Abodunrin and Akande (2009) and Adjorlolo and Ellingsen (2013) show similar results. Although EPR is still an emerging area especially in mental health care, the level of awareness of participants in the present findings is appreciable. These results may have been driven by the increased availability of personal computers (Ajuwon, 2003) and increased accessibility to the internet (Akanbi et al., 2012).

Findings from the present study on computer literacy and use revealed that participants had varying levels of literacy in computing and used this in different ways including research and entertainment. Even though participants had no access to computers at the workplace (except for the records department), almost all have personal computers which may suggest that mental health professionals are accepting the use of computers to make work easier. For those without access to computers, the propensity that their knowledge in computing will decay is high. There is therefore the need to institute measures to address this problem because access to and frequent use of computers instil confidence in the health workers to use EPR when implemented (Adjorlolo & Ellingsen, 2013; Boonstra & Broekhuis, 2010).

5.2 Perceived benefits of EPR in mental health care delivery.

The second research objective sought to identify the perceived benefits of EPR in mental health care delivery. The study discovered that there would be enhanced productivity as a key benefit of EPR in mental health delivery. By enhanced productivity, most participants elaborated that, an EPR system has the ability to make work faster and reduce patient waiting time thus increasing work output. Enhanced productivity is likely to motivate participants to push for EPR adoption
since the shortcomings of the current paper based record keeping system have been compromising their efforts at work. This result is consistent with studies by the following authors: Avison & Young (2007); Ayatollahi et al. (2015); Christensen & Grimsmo (2008); McGinn et al. (2011); Sood et al. (2008). This result may be suggestive of a real positive impact of EPR on health care delivery services. In addition to several publications documenting the benefits of the use of EPRs, Forster et al. (2008) indicate that more effort is still required to optimise the benefits of EPRs in developing countries. In her eight years of experience as a mental health nurse, the researcher of this study observed that it takes the regular patient approximately five (5) long hours to go through the routine of one hospital visit. This is largely due to unco-ordinated workflow and time spent in retrieving case files resulting in long waiting time. The researcher acknowledges that her observations may however be biased since she is also a mental health nurse. Nevertheless, responses from participants suggest that implementation of EPR has the potential to reduce the long waiting time endured by patients during their hospital visits.

Another benefit according to participants is that EPR prevents loss of clinical information. The possible reason for this assertion could be because EPR offers the alternate means for storing information electronically. Electronic information could also be liable to destruction by viruses and mechanical breakdown. However, participants conversely stated that EPR is a more secure way of storing patient information. This finding is in tandem with William and Boren’s (2008) study which indicated that EPR reduces or prevents the possibility of losing patients’ records. Participants in the present study stated that the use of paper based medical record increases the probability of records being lost through various means such as fire, flood, misfiling, and mishandling. Losing patients’ previous clinical records could be costly in terms of time, effort, money and could even cost a life (Kutesa & Frantz, 2016).
The findings from the present study agree with both Boyer, Samuelian, Fieschi and Lancon (2010) and Donnelly (2009) that an EPR system provides easy access to patient information. Participants were of the view that, an EPR system can be viewed at multiple locations at all times thereby increasing convenience and maximising effort. Obviously, digital storage implies less physical space to store paper folders thus reducing the long hours spent in retrieving folders. Interestingly, Boyer et al. (2010), Donnelly (2009) and this current study were all conducted in similar settings (mental health care facilities) with similar participants (mental health professionals). This may have contributed to the comparable findings even though all three studies were conducted in different geographical and cultural backgrounds.

The present study also identified reduction in the use of paper as a potential benefit. According to participants, this can be achieved through the use of the EPR system when no paper is used for prescribing or documentation or for requesting laboratory investigations. Instead, there will be e-prescription, e-documentation and electronic test requests. By this means, patient records could easily be organized to generate reports for institutional, regional and national repositories (van Ginneken, 2002). This finding supports Donnelly’s (2009) findings that electronic records reduce the use of paper; thus less storage space for paper folders.

5.3 Perceived barriers to EPR in mental health care delivery.

The third research objective sought to identify the perceived challenges in the use of EPR in mental health care delivery. The study identified that funding, internet connectivity, resistance to change, computer illiteracy, lack of maintenance, unstable power supply and data transfer to EPR were critical hindrances to the use of EPR. These findings are similar to the findings of William and Boren (2008) when they discovered that lack of electricity, cost of maintenance, cost of acquiring an EPR software, and resistance to change are major hindrances to the effective implementation
of EPR in a health facility. William and Boren (2008) further found high cost of training personnel as an additional hindrance which was not evident in the current study possibly because they used a larger sample size \( n = 45 \) comprising a broader range of health care professionals and thus obtained a wider range of perspectives. This study could not do same because of limited time, lack of funds and a limited range of health care professionals. The similar findings in the two studies can however be appreciated because both studies were conducted in tertiary health care institutions with similar cultural, environmental and geographical characteristics.

The barriers identified in the current study also corroborate those of Jha et al. (2009) whose study centred on the use of EPR in US hospitals. The two studies (comparing with the present study) were conducted in two geographically different locations with very distinct socioeconomic backgrounds and yet their findings are parallel. According to Adjorlolo and Ellingsen (2013), problems that can hinder the implementation of ICT in the health care industry are not alike for all countries particularly comparing countries with high socioeconomic backgrounds with LMICs. This study’s findings however prove otherwise.

Concerning funding for EPR implementation as pointed out in the present findings of this study, most participants projected that implementing EPR will be an expensive venture. Stemming from the cost of acquiring the necessary hardware and the software, providing a conducive environment for operation, cost of training, cost of maintenance and for long term sustainability. Funds will also be needed to refurbish and revamp the ICT department which is in a deplorable state. The availability of funds appears to be a very significant consideration that must be addressed well for the success of EPR. Similarly, this finding correlates with the findings of other authors like Jha, Bates et al. (2009); Meade, Buckley & Boland (2009); McGinn et al. (2011); Rao et al. (2011) and Samantaray et al. (2011). Even though this study found the high cost of implementation as a
barrier, Kuoni (2012) had it that, the long-term financial gains have the potential to outweigh the high initial investment. The estimated financial gain as suggested by participants in the current study will be a result of savings in several areas including savings from printing large stationery for use as case folders or prescriptions pads and the like.

As showed in the findings of the present study, internet connectivity is a potential barrier that needs to be addressed for the successful implementation of EPR. As it stands, only the administration and the records department of the hospital have internet connectivity which is not without challenges. As noted by other researchers (e.g. Adjourlolo & Ellingsen, 2013) there were substantial problems and operational challenges such as computer viruses, unreliable connectivity and limited bandwidth. The facility needs to network all the departments and wards before rolling out on EPR. This is essential because problems with internet connectivity could affect the efficacy and efficiency of EPR. It is necessary to seek suitable solution to the problem of internet connectivity for EPR to be able to make any meaningful contributions. This finding supports Adjourlolo & Ellingsen's (2013) findings. Both studies were conducted in similar geographical settings which could have accounted for the comparable results.

As part of any organisational change, a number of workers resist new systems (Ash & Bates, 2005; Carnall, 2007). It was therefore not very surprising when participants in the current study identified resistance to change as a potential barrier to EPR implementation. This finding, however, is in tandem with previous studies such as (Alanazy, 2006; Donnelly, 2009; WHO, 2006). This finding can influence the success or failure of EPR in the health care settings (Walter, Cleary & Rey, 2000) as can lack of training as pointed out by participants. Universally, studies have proven that one of the most common and pervasive barriers to implementing health information technologies is staff resistance to the new system. The problem of staff resistance therefore needs to be given apt
attention in order to increase acceptance of EPR among mental health professionals. For instance, prior to instituting EPR, aggressive in-service training for staff to enable them appreciate the need for EPR may be helpful.

Computer illiteracy was another barrier identified in this current study. Computer illiteracy could be explained by the lack of available computers at the workplace which does not encourage staff to invest in acquiring knowledge in computers. However, some earlier studies have also reported similar challenge (computer illiteracy) to EPR implementation (Alanazy, 2006; Alkraiji, Jackson, & Murray, 2013; Hasanain & Cooper, 2014; WHO, 2006). Other similar findings cited in the literature include unqualified users, and lack of focus on the end users (Deutsch, Duftschmid, & Dorda, 2010). Such difficulties can be addressed by establishing change-management programs from the onset of the implementation (Ajami & Bagheri-Tadi, 2013; Deutsch et al., 2010).

Unlike the paper based medical record, EPR is mainly reliant on constant supply of electricity to operate. In Ghana, electricity supply from the national grid is not a dependable source for health care operations. The problems of unpredictable power supply and load shedding (“dumsor” as it is commonly called in the local Ghanaian dialect) are characteristic of the national power supply and can undermine the benefits of using EPR in the hospital. The researcher was therefore not startled when nearly all participants pointed out electricity supply as a prospective barrier. This finding is consistent with other studies such as Adjarlolo & Ellingsen (2013) and Williams & Boren (2008).

Similar to the study of Loomis et al. (2002) and Ludwick & Doucette (2009), another barrier perceived by participants was the transfer of data from paper to the electronic system. This, participants said will be tedious and time consuming. This may be related to the perceived inability
of mental health professionals to handle the system or their low computer skills (e.g. typing). This finding supports that of Loomis et al. (2002) and Ludwick & Doucette (2009).

5.4 Ways of mitigating the perceived challenges associated with EPR.

The fourth objective of this study sought to identify ways of mitigating the perceived challenges associated with EPR. The study discovered sustainable source of funding, a willing workforce, improved computer literacy of mental health professionals, sustainable energy supply, routine maintenance and data entry clerks as key drivers to mitigating the identified potential challenges. Previous studies identified similar solutions in Ghanaian hospitals (Adjorlolo & Ellingsen, 2013; Williams & Boren, 2008).

The responses from the participants in the current study indicate that a willing workforce is essential for the successful implementation of an EPR system. A willing workforce to some extent indicate that participants will anticipate change and will be less likely to get frustrated when changes start to manifest. Such a finding could assist with future EPR implementations. Since the more knowledgeable staff are, the more they would appreciate the electronic system (Hasanain & Cooper, 2014), it is important to raise awareness to increase acceptance and the willingness of staff to use the electronic system. The successful implementation of IT systems is highly dependent on user acceptance (Wallis, 2007) and if mental health professionals would embrace EPR, they must be consulted on its introduction and use prior to adoption. Foremost, mental health professionals need to be engaged in IT decision making, because they know better than anyone what makes their jobs difficult and what can alleviate it and make it more effective (Horn, 2006). This will instil confidence that the technology can meet their needs and will ensure success. No one person can make EPR happen neither is there a single step solution to alleviate the challenges associated in
EPR introduction therefore everybody involved needs to be part of the discussions for successful implementation (Callan & Claude DeShazo, 2007).

Another response from participants on mitigating potential barriers is improving mental health professional’s computer literacy. Hasanain and Cooper (2014) agree that providing training sessions to end-users is an approach needed to be considered. Having well-trained EPR end-users would assist in overcoming barriers such as staff resistance to use of new technology. Initial formal training was portrayed favourable by some participants in the current study which is also congruent with the findings of Ford, Menachemi and Phillips (2006). Albeit, insufficient training is often identified as a barrier, either because there was not enough training or because classroom training was ill-suited for health care professionals.

The problems of unreliable electricity supply and load shedding are typical of the national power supply in Ghana and can undermine the benefits of using EPR. The acquisition of a standby plant (generator) as an alternate source of power, against any possible problem with the national power, could help meet the power requirements for the hospital (Adjorlolo & Ellingsen, 2013). This effort though laudable, may not always be reliable since managing it appears costly to the management. A more suitable and permanent solution may be needed to defeat this challenge.

Routine maintenance was identified in the current study as a means to alleviate the challenges involved with EPR introduction. In order to overcome this maintenance burden, there is a need for standard operating procedures in situations of sudden breakdown so that even the lay person can follow suite (Hasanain & Cooper, 2014). Also, the used hardware, or even networks, may breakdown at any time. In this regard, sufficient funds need to be allotted for regular repairs to avoid any risks or errors in the future. Furthermore, it would be more effective if the relevant IT
services strategize for regular upgrades and continuous monitoring of the system’s performance and effectiveness (Sittig & Singh, 2009).

Addressing the potential problem of transferring patients’ information from paper to the electronic system, a participant suggested the services of data entry clerks but the issue that begs many questions will be “how then do we protect the privacy and confidentiality of our patients?

5.5 Dissatisfaction with paper records

Based on the participant responses, there was gross dissatisfaction with the paper record system based on missing records, duplication of records, limited storage space, inconveniences to patient and staff and often inaccurate data. The reasons for participants’ dissatisfaction with the paper record system justify their need for an electronic record system. This satisfies the prior conditions stipulated by Rogers (2003) that suggests that before the adoption and implementation of any new technology, there should be a previous practice and felt needs among others to trigger the need for change.

Also participants stated that duplication of patient information in several forms for various reasons was worrying and time consuming. Conversely, EPR is able to eliminate the need for medical staff to duplicate medical record documents and to physically pull and file charts and documents (Aklilu, 2012; Gates & Urquhart, 2007; Schuman, 2006) giving EPR the relative advantage over the paper system.

5.6 Discussion on the relevance of the model

The first two stages of the Adoption-Decision Process (Knowledge and Persuasion) of Rogers Diffusion of Innovation Model was used to formulate the objectives for this study and the constructs of the model helped to organise the findings in this study. On a whole, the current study
confirmed Rogers DIT when it identified an emerging theme “dissatisfaction with paper records which satisfies the prior conditions (felt needs) in the model

In summary, the model was a good fit for this study even though not all the conditions within the model were utilised.

5.7 Summary of Discussion

Participants demonstrated an appreciable level of knowledge of EPR through their awareness of EPR, understanding of EPR, the content of their knowledge of EPR, experiences with EPR and their attitude towards it. The finding that a whopping majority of the participants were aware of the concept, even though not many knew what it really entailed, provides a good foundation to the introduction of EPR system in mental health care delivery.

The identified perceived benefits of the concept of EPR included increased productivity in terms of the efficient use of scarce resources, which include money, time and space, to meet the expected health care delivery standards of patients. It is also perceived that EPR, when implemented would prevent or reduce the current menace of losing vital patients’ information, which plagues the paper based system and ensure that there is easy access to this information in the delivery of care. The security of patients’ information in an electronic system also promotes continuity of care since EPR would contain every information on the patient such as lab results and previous diagnosis. Relatively, EPR has massive advantages over the paper based system, which was easily identified by the participants. EPR also brings with it the reduction of human error and paper use in the treatment of patients.

Despite the glaring benefits of EPR, there are some challenges that could hinder the realisation of these. These include the requirement for huge initial capital or funds, which are already scarce and
account for other challenges in the health sector. Unreliable internet facility and electrical power supply could also impede the use of EPR, especially in Ghana, where recently there was a national crisis in electricity supply leading to power rationing. The poor maintenance culture, which is of a major concern in other sectors of Ghana, can also hamper the realisation of the intended benefits of EPR, in that, the electronic machines face the risk of not being maintained regularly and not being repaired when they break down. Also, the handling of existing health information held in paper folders could be a challenge of EPR. In the case where information in paper folders are not migrated into the electronic system, this vital information may be lost. On the other hand, one would have to face the humongous task involved in transferring (typing) these existing information into the database of the EPR system.

There is the utmost need to surmount these barriers if the facility desires to attain the full benefits of EPR. This could be done by ensuring that there are sustainable and reliable sources of funding, internet facility and electricity power supply. Alternative sources of these supplies could be employed, if the existing sources cannot be improved. The development of comprehensive training programmes on the use of EPR and computing are good means by which the perceived barriers of staff resistance to the introduction of EPR and computer illiteracy could be overcome. Organized training sessions resulting from these training programmes, however, need to be consistent and monitored for needed reviews.

Participants’ huge dissatisfaction with the paper based records system was conspicuous from the findings of the study in terms of the loss of vital information through misfiling and destruction of the paper folders. The paper based record system is also plagued with the risk of duplication of records, resulting in the generation of inaccurate data for management’s consumption. A key requirement of this system (paper based) is storage space, which has become very limited and used
up due to the bulky nature of the paper folders; thus becoming very burdensome and dissatisfying to mental health professionals. With these weaknesses, both patients and health professionals are gravely inconvenienced with the use of paper folders in keeping records of patient information. This justifies the need for an electronic record system which is highly recommended by mental health professionals.
CHAPTER SIX

SUMMARY, IMPLICATION, LIMITATION, CONCLUSION AND RECOMMENDATION

6.0 Introduction
This chapter of the study presents the summary of the research findings, conclusions, and recommendations. It also discusses the study’s contributions to policy and management of the health sector. The limitations of the study and recommendations for further studies are also discussed.

6.1 Summary of the Study
In order to address the objectives of the study, the study adopted a qualitative approach and so shared the view of qualitative philosophical assumptions (Creswell, 2013) which argue that human behaviour is so complex and as such cannot wholly be subjected to mere numbers and therefore asking people to construct their own meaning of reality is one of the ways to identify truth.

The first objective of the study was to explore the knowledge of mental health professionals on EPR at the Accra Psychiatric Hospital. The study found that most of the mental health professionals are aware of and understood the concept of EPR and have therefore developed a positive attitude towards it.

Also, the second objective was to identify the perceived benefits of EPR in mental health care delivery. It was discovered from the study that there is enhanced productivity as a key benefit of EPR in mental health delivery and this suggests a clear indication as to the real positive impact of EPR on health care delivery services.
Furthermore, the study set out to identify the perceived challenges in the use of EPR in mental health care delivery. The study found that funding, internet connectivity, resistance to change, and unstable power supply were critical hindrances to the use of EPR.

Finally, the study sought to explore ways of mitigating the perceived challenges associated with EPR. It was discovered that comprehensive and efficient staff training is considered essential in any health care delivery system. Extensive staff training programs, coordination and planning to train staff from all sections across the hospital, are required during implementation of an EPR system. Also, the need to have a reliable internet access, sustainable source of funding and stable source of power supply were identified as ways of mitigating the perceived challenges of EPR.

There was an emerging theme on “dissatisfaction of paper records” which satisfied the prior conditions (previous practice, felt needs) in Rogers Model, thus confirming the relevance of the model.

6.2 Implications
The findings of this study have implications for nursing education, nursing practice, policy formulation and monitoring, for administration and hospital management and for future researches into the subject.

6.2.1 Implication for Nursing Education
At the center of equipping health professionals with the requisite skills and knowledge in the use of EPR is Education. The findings of the study have made it necessary that nursing education in EPR, at all levels of mainstream education including diploma, first degree, master’s degree and specialist levels, should be included in their curricula. This course would allow for the impartation of the skills and knowledge of EPR and how it is applicable at each level. This would help increase
further the level of knowledge health professionals would have on the subject of EPR before commencing practice and during practice.

Also, it would be appropriate to include education on EPR as part of training sessions, conferences and seminars organized by the Ghana Health Service and professional bodies such as the Nursing and Midwifery Council of Ghana (NMC). The findings of the study also have the implication of including the concept of EPR in in-house training sessions organized by the facility, where preceptors and IT personnel impart knowledge on EPR. This will, however, require the revamping of the deteriorating and abandoned ICT infrastructure at the facility so as to ensure the smooth implementation of the in-service training programmes on EPR.

6.2.2 Implication for Nursing Practice

The study findings, in terms of the perceived benefits, make it critical for EPR to be inculcated in the nursing practice to do away with the paper-based system of record keeping. The study has proven that the use of EPR by the nurse at every level of the health delivery system would make documentation faster, less tedious and accurate. This would also ensure that reports generated by the nurse are accurate and reliable to the appropriate quarters.

On the ward level, nursing practice would be greatly improved in terms of giving ample time to the nurse, from the time she receives the electronic message from the consulting room of a new admission case, to adequately prepare to receive the patient by creating the needed space with needed equipment, having in mind the condition of the patient, before the patient actually arrives on the ward.

At the community health level, the study has made it necessary to inculcate EPR as this will enable the quick retrieval of relevant patient information by the various community mental health nurses
to assist in visiting discharged mental patients and their relatives at their residences for the purpose of giving continuity of care and education.

**6.2.3 Implication for Policy Formulation and Monitoring**

The findings of this study call for the need of policy formulation by the government to give attention to the introduction and implementation of EPR to give it a stronger national backing to surmount the staff resistance and other barriers that are perceived to face the implementation of EPR. Policy formulation on EPR would compel the government and the Ghana Health Service to provide the needed funding, whether from local sources or international sources to cater for both the initial cost and operational cost of EPR. The policy formulation must also include monitoring measures to ensure that, EPR systems, when implemented, does not fizzle out due to lack of maintenance of the infrastructure and lack of adequate training of staff.

**6.2.4. Implication for Administration and Hospital Management**

The study recommends that management and administration at the Accra Psychiatric Hospital should gravitate towards the application of technology for the effective running and operation of health care delivery. This can be done through obtaining the needed funding to set up the EPR system; ensuring the good maintenance of the system; planning a structured training programme for health professionals in the use of the system; and acquiring and maintaining stable power supply source and a reliable internet facility.

The study also requires that personnel with the requisite ICT skills are employed to manage the entire system at the facility and to provide assistance and training for the workforce on the use of EPR.
6.2.5 Implication for Future Research

This study could also be broadened to evaluate the use of EPR among mental health professionals nationally and/or the impact of its introduction.

6.3 Limitation of the Study

The mental health sector in Ghana comprises of a huge scope but this study focuses only on EPR system. The study was limited to one out of the three government owned psychiatric hospitals in Ghana that is the Accra Psychiatry Hospital located in Accra. However, it typifies all the other psychiatric hospitals because it is the oldest, largest and most populated in terms of both patients and service providers. This research focused on only mental health professionals.

6.4 Conclusion

This research reveals that implementing an EPR system in a Mental Health care facility comes with both benefits and challenges. Despite the difficulties and challenges associated with its implementation, in general, file organization and communication among mental health professionals are key benefits from EPR. Training users is definitely a laudable feat, as difficulties with the use of computers was mentioned by some of the participants. In this regard, the adoption of an EPR has to deal with change and the administration of the health facility must give the personnel an appropriate training on the system. The general appearance of the system is as important as the confidence in the system, which may positively affect the user's perception and attitude towards the system. The time it takes to electronically obtain statistics and reports is less in the EPR system than it is in the paper-based system. Reports provide information required for decision making and the system makes them feel confident with the reports and statistics.
6.5 Recommendations

6.5.1 To Ministry of Health (MoH)

To the Ministry of Health, the study recommends that EPR should be considered for all the three (3) psychiatric hospitals in the country.

It is also recommended that the ministry revises the workforce structure and motivation/reward structure to allow for the recruitment of IT managers and staff to oversee the smooth running of the EPR system in the three psychiatric hospitals.

6.5.2 To Ghana Health Service

It is strongly recommended that the Ghana Health Service, with the help of its management team, will effectively see to the implementation of EPR system in the health delivery system.

6.5.3 To the Mental Health Authority

With the Mental Health Act (Act 846) passed in 2012, it is recommended that the Mental Health Authority continues advocating the passing of the legislative instrument, which is currently before the Parliament of Ghana. This legislative instrument, when passed, will back the implementation of telemedicine, of which EPR is part.

6.5.4 To Accra Psychiatric Hospital

The management of the hospital should have in place a structured computer training and educational programme for its staff to increase their computer literacy level. This will further help reduce the potential resistance from staff to the new concept of EPR.

The management should also have in place and instil a maintenance culture as a means of keeping the EPR system smoothly running after implementation.
In addition to the funding from the benevolent stakeholders to implement the EPR, the hospital could also use internally generated funds to augment the efforts of the ministry in the implementation of the EPR system.
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Mental Health Professionals’ Perspectives On Electronic Patient Record


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Mental Health Professionals’ Perspectives On Electronic Patient Record


# APPENDICES

## Appendix A: Demographic Characteristics of Participants

### Table 2: Demographic Characteristics of Participants

<table>
<thead>
<tr>
<th>Pseudonyms of Participants</th>
<th>Age Group (Years)</th>
<th>Gender</th>
<th>Marital Status</th>
<th>Highest Educational Level</th>
<th>Profession</th>
<th>Working Experience (Years)</th>
</tr>
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<td>Single</td>
<td>Diploma</td>
<td>Recorder</td>
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</tr>
<tr>
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<td>Male</td>
<td>Single</td>
<td>Diploma</td>
<td>Recorder</td>
<td>2</td>
</tr>
<tr>
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<td>Male</td>
<td>Single</td>
<td>Diploma</td>
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<td>4</td>
</tr>
<tr>
<td>Sefa</td>
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<td>Male</td>
<td>Married</td>
<td>Degree</td>
<td>Recorder</td>
<td>11</td>
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<tr>
<td>Efo</td>
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<td>Single</td>
<td>Degree</td>
<td>Recorder</td>
<td>6</td>
</tr>
<tr>
<td>Joy</td>
<td>31 – 40</td>
<td>Female</td>
<td>Married</td>
<td>Degree</td>
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<tr>
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<td>Single</td>
<td>Degree</td>
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</tr>
<tr>
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<td>Female</td>
<td>Single</td>
<td>Degree</td>
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<td>12</td>
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<td>Female</td>
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<td>Degree</td>
<td>Mental Health Nurse</td>
<td>7</td>
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<tr>
<td>Akos</td>
<td>31 – 40</td>
<td>Female</td>
<td>Single</td>
<td>Degree</td>
<td>Mental Health Nurse</td>
<td>9</td>
</tr>
<tr>
<td>Dela</td>
<td>21 – 30</td>
<td>Female</td>
<td>Single</td>
<td>Degree</td>
<td>Mental Health Nurse</td>
<td>6</td>
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<tr>
<td>Ato</td>
<td>21 – 30</td>
<td>Male</td>
<td>Single</td>
<td>Degree</td>
<td>Medical Doctor</td>
<td>2.5</td>
</tr>
<tr>
<td>Ama</td>
<td>31 – 40</td>
<td>Female</td>
<td>Married</td>
<td>Degree</td>
<td>Mental Health Nurse</td>
<td>9</td>
</tr>
<tr>
<td>Kwesi</td>
<td>51 – 60</td>
<td>Male</td>
<td>Married</td>
<td>Doctorate</td>
<td>Psychiatrist</td>
<td>Above 20</td>
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Appendix B: Summary of Benefits of EPR implementation

Table 3: Summary of Benefits of EPR implementation

<table>
<thead>
<tr>
<th>Benefits</th>
<th>Reference(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enhances the quality of care</td>
<td>Miller, West, Brown, Sim, &amp; Ganchoff, 2005</td>
</tr>
<tr>
<td>Aids in assessment and diagnosis</td>
<td>Lópex-Robledo et al., 2014</td>
</tr>
<tr>
<td>Allows for continuity of patient care</td>
<td>Kierkegaard, 2011; Flemming &amp; Hübner, 2013</td>
</tr>
<tr>
<td>Eliminates the duplication of patient records</td>
<td>Donnelly, 2009</td>
</tr>
<tr>
<td>Easy to store and retrieve records</td>
<td>Kumar &amp; Aldrich, 2010; William &amp; Boren, 2008</td>
</tr>
<tr>
<td>Reduces medical errors</td>
<td>Hillestad, Bigelow, Bower, Girosi, Meili Scoville &amp; Taylor, 2005</td>
</tr>
<tr>
<td>Enhances patient safety</td>
<td>Hillestad et al., 2005; Peña-López, 2010</td>
</tr>
<tr>
<td>Easy access and availability of clinical data</td>
<td>Christensen &amp; Grimsmo, 2008; Hoffman &amp; Podgurski, 2011; Ogundipe, 2011</td>
</tr>
<tr>
<td>Complete and accurate information</td>
<td>Msukwa, 2011</td>
</tr>
</tbody>
</table>
Appendix C: Summary of Barriers to EPR implementation

Table 4: Summary of Barriers to EPR implementation

<table>
<thead>
<tr>
<th>Barriers</th>
<th>Reference(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>High cost of procurement and maintenance</td>
<td>McGinn et al., 2011; Rao et al., 2011; Samantary et al., 2011</td>
</tr>
<tr>
<td>Uncertainty about the return of the investment</td>
<td>Jha et al., 2009; Boonstra &amp; Broekhuis, 2010; Miller and Sim 2004</td>
</tr>
<tr>
<td>Low computer literacy among health care professionals</td>
<td>Adjorlolo &amp; Ellingsen, 2013; Alkraiji, Jackson, &amp; Murray, 2013; Hasanain &amp; Cooper, 2014</td>
</tr>
<tr>
<td>Computer down time/ computer viruses</td>
<td>Adjorlolo &amp; Ellingsen, 2013; Msukwa, 2011;</td>
</tr>
<tr>
<td>Resistance to change</td>
<td>Boonstra &amp; Broekhuis, 2010;</td>
</tr>
<tr>
<td>Transition from paper to EPR (data transfer)</td>
<td>Davidson &amp; Heslinger, 2006; Loomis, 2002; Ludwick &amp; Doucette, 2009</td>
</tr>
</tbody>
</table>
Appendix D: Consent Form

NMIMR-IRB CONSENT FORM TEMPLATE

Title: Mental Health Professionals’ Perspective on E-Patients Records at the Accra Psychiatric Hospital

Principal Investigator: Eugenia Akusika Xatse

Address: University of Ghana
School of Nursing
P.O. Box LG 43
Legon
Tel: 0208543799
E-mail: eakusika@gmail.com

General Information about Research

This study seeks to explore mental health professional’s perspective on Electronic Patient Records (EPR). The purpose of the study is to describe the knowledge, perceived usefulness and perceived challenges associated with electronic patients’ records in mental health service delivery as well as proposed ways of minimizing the perceived challenges.

You will be engaged in an interaction that will last between 45 minutes to 90 minutes in English. The interviewer will record this interaction and you will be required to sign a consent form before the interview starts. You are encouraged to freely share your opinion as there will be no right or wrong answers. You are unrestricted to ask any questions concerning the research. Your participation is entirely voluntary. All data including audiotape recordings, field notes and other relevant materials gathered from our interaction will be kept safely under lock for five years and then discarded when there is no use for it by the researcher. To ensure privacy and confidentiality, only the researcher and supervisor will have access to the raw data. Your name is not needed. Instead, pseudonyms will be used in order to ensure anonymity.

Possible Risks and Discomforts

It is not expected that you will experience any physical, social or psychological risks by participating in this study. However, you are encouraged to communicate any dis-ease you may feel during the process for immediate attention. You can also request for a break if you so wish.
Possible Benefits

You may not benefit directly from this study. However, your participation will help bring out ideas that would inform relevant stakeholders in the adoption and subsequent implementation of EPR in mental health service delivery.

Confidentiality

The interview will be conducted at a place convenient to you such that no one will hear or know about what you say. The interview will be audiotaped and be typed out later. False names will be used on all documents written about our interaction. Numbers will also be written on the audiotapes and the typed scripts so that only the researcher will be able to know about your identity. All the information provided to the researcher will be accessible to my research supervisors and myself only and will be used solely for research purposes. The researcher will use what you say during the interview to help her understand the concept under study. A copy of the report will be given to policy makers and other relevant stakeholders for decisions to be taken. A copy of the study findings will also be given to you if you want. These findings will however not have your names in any of them.

Compensation

As a form of compensation, you will be given some snacks for taking time to be part of the study. The snacks will be a bottle of soft drink and meat pie or biscuits. Those will be provided at the end of the interview. There will be no financial compensations for participation.
Voluntary Participation and Right to Leave the Research

Your participation in this study will be entirely voluntary and you can withdraw at any time without any penalty, even after signing the consent form.

Termination of Participation by the Researcher

Your participation in the study will be terminated if you do not sign the consent form and if you are not willing to give information regarding the study.

Contacts for Additional Information

For more information about the study, you can also contact the following people:

Supervisors:

Dr. Samuel Atindanbila
Department of Psychology
University of Ghana
Box LG 84
Tel: 02777532705, 0546620102
E-mail: atindanbila@ug.edu.gh

Rev. Alexander Attiogbe
Mental Health Department
School of Nursing
College of Health Sciences
University of Ghana
Tel: 02787066255
E-mail: almatiogbe@ug.edu.gh

University of Ghana  http://ugspace.ug.edu.gh
Your rights as a Participant

This research has been reviewed and approved by the Institutional Review Board of Noguchi Memorial Institute for Medical Research (NMIMR-IRB). If you have any questions about your rights as a research participant, you can contact the IRB Office between the hours of 8am-5pm through the landline 0302916438 or email addresses: nirb@noguchi.ug.edu.gh

VOLUNTEER AGREEMENT

The above document describing the benefits, risks and procedures for the research title (Mental Health Professionals’ Perspective on E-Patient Records at the Accra Psychiatric Hospital) has been read and explained to me. I have been given an opportunity to have any questions about the research answered to my satisfaction. I agree to participate as a volunteer.

Date ___________________________ Name and signature or mark of volunteer

If volunteers cannot read the form themselves, a witness must sign here:

I was present while the benefits, risks and procedures were read to the volunteer. All questions were answered and the volunteer has agreed to take part in the research.

Date ___________________________ Name and signature of witness

I certify that the nature and purpose, the potential benefits, and possible risks associated with participating in this research have been explained to the above individual.

Date ___________________________ Name Signature of Person Who Obtained Consent

VALID UNTIL 28 NOV 2017
Appendix E: Interview Guide

Data Collection Instruments

PROPOSED INTERVIEW GUIDE

1. Your age group
   - 21 – 30
   - 31 – 40
   - 41 – 50
   - 51 – 60

2. Please indicate your gender
   - Male
   - Female

3. Please indicate your highest educational achievement
   - Diploma
   - First Degree
   - Masters

4. What is your main profession?
   - Mental Health Nurse
   - Medical Doctor
   - Pharmacist
   - Recorder
   - Other (Specify)

5. How long have you been practicing (in years)?

6. How satisfied are you with your health record system; do you think it will be fine if the system is changed?

7. What is your understanding of EPR?

8. What do you think would be some of the benefits associated with EPR in your facility?

9. Identify some ways by which EPR can contribute to mental health care delivery

10. In what ways can EPR improve your work?

11. What are the reasons why EPR software is not being used at this facility?

12. Identify some potential barriers that could be associated with EPR use

13. What would be the challenge associated with the move from the traditional paper base system to a computerized system?

14. How can the challenges identified be controlled?
Appendix F: Introductory Letter

The Medical Director
Accra Psychiatric Hospital
Accra

December 16, 2016

Dear Sir/Madam,

INTRODUCTORY LETTER

I write to introduce to you Eugenia Akusika Xatse, an MPhil student of the School of Nursing, University of Ghana, Legon. She is seeking your permission to collect data for her research on the topic “Mental Health Professionals Perspective on E-patients Records.”

I should be most grateful if you could kindly assist her with the information that she may require.

Thank you.

Yours faithfully,

Alex Atiogbe Mensah (Rev)
SUPERVISOR
The Medical Director
Pantang Hospital
Accra

Dear Sir,

INTRODUCTORY LETTER

I write to introduce to you Eugenia Akusika Xatse, an MPhil student of the School of Nursing, University of Ghana, Legon. She is seeking your permission to undertake piloting of her research topic “Mental Health Professionals Perspective on E-patients Records.”

I should be most grateful if you could kindly assist her with the information that she may require.

Thank you.

Yours faithfully,

Alex Attiogbe Mensah (Rev)
SUPERVISOR
Appendix G: Ethical Clearance

OGUCHI MEMORIAL INSTITUTE FOR MEDICAL RESEARCH
Established 1979
A Constituent of the College of Health Sciences
University of Ghana

INSTITUTIONAL REVIEW BOARD
Post Office Box LG 581
Legon, Accra
Ghana

29th November, 2016

ETHICAL CLEARANCE

FEDERALWIDE ASSURANCE FWA 00001824 IRB 00001276
NMIMR-IRB CPN 012/16-17 IORG 0000908

On 29th November, 2016 the Noguchi Memorial Institute for Medical Research (NMIMR) Institutional Review Board (IRB) conducted expedited review and approved your revised protocol titled:

TITLE OF PROTOCOL: Mental Health Professionals’ Perspective on E-Patient Records at the Accra Psychiatric Hospital

PRINCIPAL INVESTIGATOR: Eugenia Akusika Xatse, MPhil Cand.

Please note that a final review report must be submitted to the Board at the completion of the study. Your research records may be audited at any time during or after the implementation.

Any modification of this research project must be submitted to the IRB for review and approval prior to implementation.

Please report all serious adverse events related to this study to NMIMR-IRB within seven days verbally and fourteen days in writing.

This certificate is valid till 28th November, 2017. You are to submit annual reports for continuing review.

Signature of Chair: ___________________________
Mrs. Chris Dadzie
(NMIMR – IRB, Chair)
## Appendix H: Work Plan

### Table 5: Work Plan

<table>
<thead>
<tr>
<th>ACTIVITY</th>
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<td>JAN - SEP</td>
<td>OCT</td>
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<td>PROPOSAL DEVELOPMENT</td>
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<td>SUBMITING PROPOSAL</td>
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<td>DISCUSSION</td>
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<td>PROOF READING</td>
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<td>DRAFT REPORT FOR SUBMISSION</td>
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<tr>
<td>FINAL WRITEUP AND SUBMISSION</td>
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