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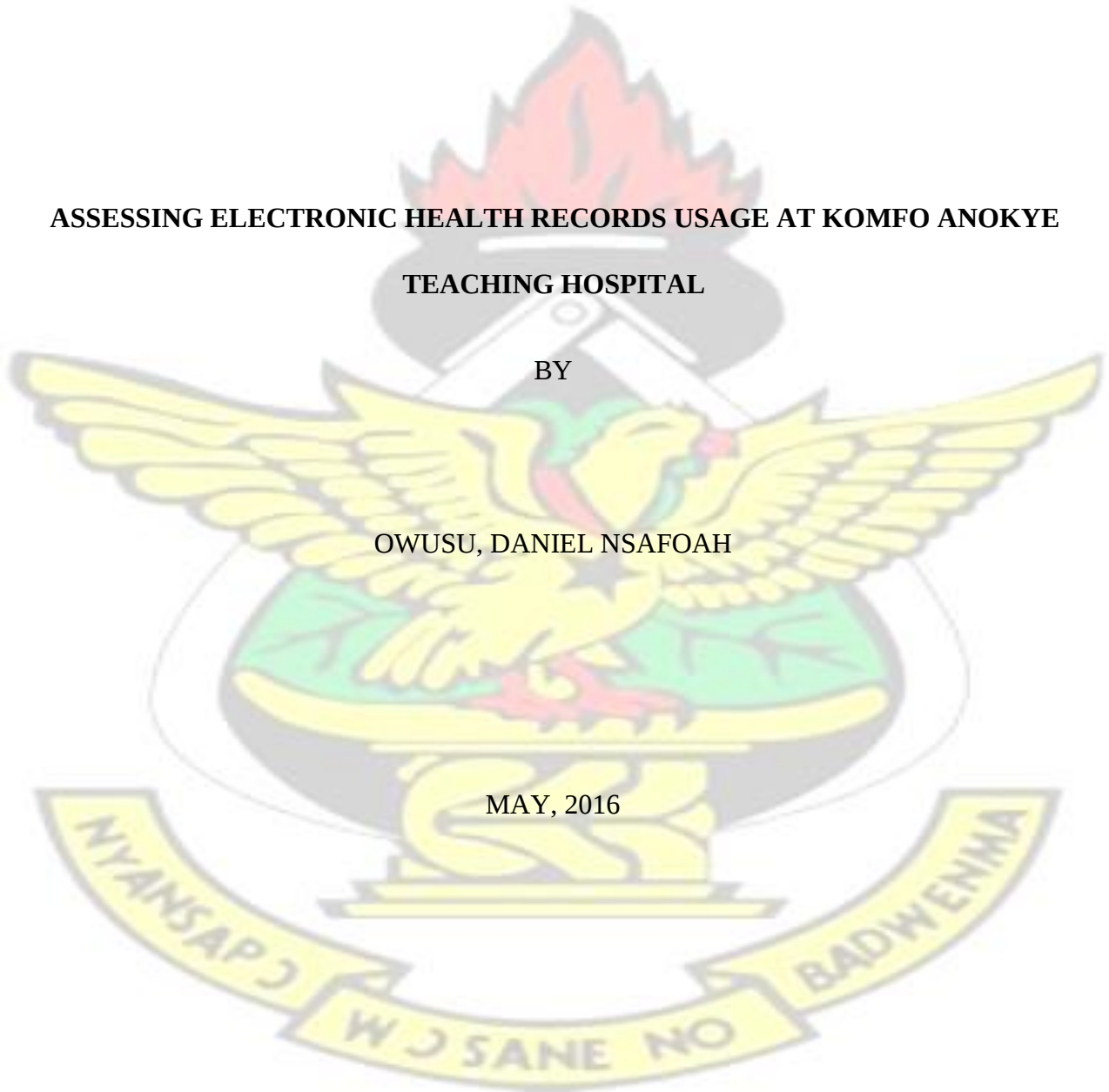
DEPARTMENT OF COMPUTER SCIENCE

**ASSESSING ELECTRONIC HEALTH RECORDS USAGE AT KOMFO ANOKYE
TEACHING HOSPITAL**

BY

OWUSU, DANIEL NSAFOAH

MAY, 2016



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A THESIS SUBMITTED TO SCHOOL OF GRADUATE STUDIES,
KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY, IN
PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE DEGREE OF
MASTER OF PHILOSOPHY IN HEALTH INFORMATICS

DECLARATION

I, Owusu Daniel Nsafoah declare that this thesis is my original work except where

Proper referencing is made in the text. The thesis has not been submitted for the award of any degree to any other University.

.....

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Date:

DEDICATION

This research study is dedicated to the Almighty God, My Parents, Brothers, My Wife Melody and lovely Daughter Nana Ama Serwaah - Akoto



ACKNOWLEDGEMENTS

I wish to express my sincere gratitude to the Almighty who has given me this gift of life. I also want to thank my supervisor Mr. E. T. Addison for his guidance during this project work.

I also want to thank the staff of Komfo Anokye Teaching Hospital for the information given for this work to be completed, not forgetting my wife for the support given. To everyone who helped me one way or the other, I say God bless you.



ABSTRACT

Patient data is the most essential and important information in health care delivery. The collection, storage, management and usage of this data contributes to the successful delivery of health care to every patient. The Komfo Anokye Teaching Hospital is a tertiary hospital found in the Ashanti Region. This project was conducted to assess the usage of Electronic Health Records of this teaching hospital. To help assess the usage, the writer made use of quantitative research methodology to collect reliable and valid information on the research. Notwithstanding, questionnaire, interview and observational or enquiry research methodologies were employed in gathering relevant information from the research population. Relevant literature on the study were consulted to find out the views of other writers on the study. Tables and charts were used to compare the results. Descriptive and inferential methods were employed to analyze the data by the use of the Statistical Package for Social Sciences version 17.0 (SPSS version 17.0) computer software package. The results indicated that the Electronic Health Record is the best mode of collecting, storing and managing patient data although there are few challenges and improvement that must be addressed.

LIST OF ABBREVIATIONS/ACRONYMS

CDSS – Clinical Decision Support System

EHR – Electronic Health Record

EMR – Electronic Medical Record

HAMS – Hospital Administration Management System

ICT – Information Communication Technology

KATH – Komfo Anokye Teaching Hospital

LAN – Local Area Network

MOH – Ministry of Health

PDAs – Personal Digital Assistant

SPSS – Statistical Package For Social Sciences

WHO – World Health Organization



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CHAPTER ONE

1.0 BACKGROUND INFORMATION

1.1 INTRODUCTION

Health records are mostly paper – based, which implies the difficulty in using it for consistent and proper monitored care, randomly and consistently check quality and control or eliminate medical mistakes and errors and as a result of storage problems and difficulty in easily retrieving and accessing this data when needed (Kushniruk et al.2004). Health care providers and patient mostly have no idea about the costs or quality in making decision about medical care. Electronic Health Record system provides the avenue to readily accessed and made available this information. Parts of this data are patient’s demographics, history, medical notes, drug administered, vital signs, laboratory results etc.

A Digital Health Record is a hierarchical electronic record of patient health data created by visits to any health facility (Bean et al, 2001). The correct information and Health Information Systems are seen as very important to reinforcing the health system in developing nation and in achieving the Millennium Development Goals. However, Health Information Systems and importantly the development of hospital information systems in a nation that is developing has shown organizational complexity difficulty (Birkhead et al, 1991), uncoordinated and fragmented organizational structures in the maintenance of their own Health Information Systems and ambitions that are not realistic.

The important effect, impact and role of Information and Communication Technology (ICT) in all areas of our society have for long been acknowledged. In the health sector, ICT-tools are being

frequently improved, recommended, and used in the development of work quality in administration, health services, patient records, and research. In the late 1980s, at the introduction of the usage of ICT-tools in most nations that are already developed, the usage of ICT-tools were not a major issue or a matter of little priority in countries or nations that are less developed.

1.2 BACKGROUND OF STUDY

The Komfo Anokye Teaching Hospital (KATH) is situated in Kumasi, the Ashanti Regional Capital with an estimated population of four million, seven hundred and eighty thousand, two hundred and eighty (4,780,280) from the 2010 Population Census. The geographical location of this hospital, the network of road in the country and commercial activities that go on in Kumasi makes the Hospital easily accessible to all the areas close to the Region and others that are not close to it. As a results, it receives referrals from the three Northern Regions (namely Upper West and East Regions, Northern Region) Central, Western, Brong Ahafo and other parts of the country. The Hospital became a Teaching Hospital in 1975 for the Medical Students' training in conjunction with the Medical School of the Kwame Nkrumah University of Science and Technology (KNUST) in Kumasi.

With recent expansion and development in the Hospital, it has been divided into more than sixteen directorates namely Polyclinic, Surgery, Oncology, Eye Ear Nose and Throat, Trauma and Orthopedic, Child Health, to mention but a few for better supervision and administration. It has a staff strength of 3658 workers (Clinical and Non Clinical Staff). This study was conducted at the Polyclinic which is one of the major entry point for most patients who visit the Hospital for the

first time on arrival except emergencies and specialist care centres. The Polyclinic has a total staff strength of about 300 staff, who run the Polyclinic on three shifts namely; Morning, Afternoon and Night.

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1.3 PROBLEM STATEMENT

Electronic Health Record (EHR) is the main and most important part of the introduction of ICT in our health delivery. Despite the use of the current EHR there has not been much improvement in service delivery, healthcare delivery and patient outcomes. Patient time at the Hospital has not changed. Patients still wait for so many hours at the hospital for service. The system is still the same as paper records.

Assessing of EHR in this health facility is to analyse how its effective use in this facility and also to compare it to international standards. Also EHR is to remove or reduce the use of paper cards and records from this facility. In spite of the huge capital globally made in the computerization of medical information systems, their total outcomes and costs have not been fully looked at. Komfo Anokye Teaching Hospital (KATH) as a teaching hospital serves mostly the northern sector of Ghana. An electronic health record called Sag System was in use early 2000's and was later replaced with Medical Pro about three – four years ago, recently a new software called Hospital Administrations Management System (HAMS) has been introduced and in use since March, 2013. This study is to assess the EHR in the hospital and also compare it with international standards.

1.4 RESEARCH QUESTION

1. How best does the Electronic Health Record support health delivery?
2. Does it help patient to get the best health care?
3. Does it reduce patient waiting - time in Health Delivery?

1.5 OBJECTIVE AND SCOPE OF RESEARCH

The main objective of this research is to assess electronic health records usage at the Komfo Anokye Teaching Hospital while the specific objectives are

1. Access and evaluate the current EHR system in the Komfo Anokye Teaching Hospital.
2. Improve and make EHR accessible to all directorates in the Hospital
3. To compare this EHR to international standards and look at how to improve the current system

1.6. ORGANIZATION OF THE STUDY

The research had been grouped into five chapters.

Chapter One has the introduction, study background, problem statement, objectives, specific objectives and limitation. Chapter two looks at important literature and is preceded by chapter three

This chapter presents the research approach and methodology used. The research design, sample size determination, the sources of data, the data collection process and analysis would be indicated.

Chapter Four takes a critical look at how the data are analyzed and interpreted. The analysis, would include the descriptive analysis (data reporting) presented in tables and graphs. Finally, the summary, conclusion as well as the recommendations of the study would be outlined in Chapter Five.

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 INTRODUCTION

EHRs provide great promise for the improvement of health care outcomes and procedures, including improvement in safety of patient. As with any health information technology, usability problems that can negatively affect the safety of patient with EHRs can be controlled, assessed, and understood. Electronic Medical Records consists of related health data that is produced from a patient by a health care worker such as patient data, test and results, prescriptions etc. The main purpose of an EHR is to increase the care giver's ability to record findings and observations and to give further information on a patient under their care. Additional functions such as drug – drug interaction, explanation of data to support clinical decisions, recommendation of best care practices are all provided by EHR (Kushniruk et al.2004). However, these functions are limited by the extent of the information available in a provider-focused EMR within a single health care organization,

hence the need to document how EMR is utilized and supports medical services in centers that use EMR system in Ghana.

There are limitations to the extent to which these functions are available in an organization's EHR, therefore the need to document how EHR is used and how it supports healthcare provision in an organization that make use of the EHR systems. The EHR is supposed to replace the paper based health record as the main source of medical history of every patient requesting for care, while still not against requirement such as administrative, legal and clinical in a developed nation (Bean et al, 2001). A lot of capital has been invested in the computerization of hospital data systems globally. Over fifty million dollars annually is invested in each large hospital in developed countries on EHR, notwithstanding the total benefit and cost of EHR have barely been accessed (Birkhead et al, 1991). On the evaluation of these systems globally, more than half have failed because no evidence to prove the improvement in the productivity in health care delivery (Britto et al, 2009).

Most systems of EHR are comparative databases with a well defined number of intra – enterprise applications and are restricted to in – house usage only by providers of medical care providers in their medical institutions. A few of these systems have fully achieved their functions, capabilities of distribution, scalable and not to talk of their interaction with systems externally. This myopic tendencies to building large – scale but limiting systems that are automated but ignoring the interactive nature of medical care has led to operational limitations in outcomes and acceptability. (Birkhead et al, 1991).

Electronic health records have the ability to increase the delivery of better medical care and cost reduction. Precise and up – to – date medical data is crucial in health care, the provider must have information about the patient in providing efficient and on time treatment such as history, allergies, chronic conditions etc. Unfortunately, EHR systems mostly give attention to the aspects supporting the hospital management and control, e.g. inventory, accounting, supplying or feeding activities. The main purpose of the EMR modules are not much advanced lies in the fact that they are the most complicated ones.

2.2 ADVANTAGES OF THE ELECTRONIC HEALTH RECORD USAGE

The ability of EHR system to change practice of health care has been practiced over the previous years to boost best delivery of medical care and enhance making decision procedure. Consequently, EHR and other clinical decision support system tools are recently used in basic and advanced medical care institutions in many countries that are developed. Some of the benefits are: correct and up – to – date data, prompt and universal access of a lifetime health data of a patient, correct facility to refer a patient to, to obtain proper care and reduction of errors in medical treatment(Bea et al, 2001) .

The EHR sometimes exists in distributive database, which may be accessed through a network mode or a card carried by patients. If better security measures are in place, EHR ensures better protection of confidential data through protected access and keys controls. In addition the systems of EHR system helps in the improvement of the quality documentation of patient's visits and data.

Little space is needed for storage since a single computer can be used for a lot of patients. EHR can be used in generation of a complete record of a patient and also support other related care activity directly or indirectly.

For patients individually, accessing better health care becomes safer and easier if records can be shared simply and easily. Information that are important such as type of blood, medical conditions, prescribed drug and other areas of our medical history -- can be accounted for much easily and faster. Basically, the existence of Electronic Health Record (EHR) will reduce the consultation time of a medical personnel. Mostly, accessing records of a patient in case of emergency promptly can save life in the occurrence of emergency and answering those questions that are needed during the decision-making process in the case of emergency.

In addition to the benefit to the individual patient, the EHR is also likely to profit the population at large. Clinical study will likely be improved, as researchers can easily have access to patient's information that will increase understanding of disease and its cure procedure. Screening and other preventive measures implementation will become easier as various attributes of patients (i.e. gender, age, presence of other risk factors) can be contacted and identified.

2.3 CHALLENGES FACING ELECTRONIC HEALTH RECORDS USAGE

The implementation challenges of EMR in health facilities in Ghana would be a demoralizing one. Efforts will have to be put in the restructuring and reorganization of flow of work to implement

effectively a better EMR. Infrastructures of information in Health Institutions in Ghana were still not strong and management and collection of data are serious challenges that are to be overcome. Few of the recent challenges affecting the implementation of EHR successfully in medical facilities in Ghana includes human resource and the availability of funds to purchase and maintenance of hardware; the ability to sustain such system.

The EMR raised concerns of privacy, confidentiality and security (Jansson et al,2005). Increase in the area of information technology, the need for value for money in delivering health care, and patient's request for more efficient and effective care had increased the way of exploring other effective ways of storage and in medical care data retrieval, and yet the implementation of the EMR was faced with many challenges technically. In comparison to other institutions and facilities, to accept the use of technology in the area of information in medical care has not been too fast. Increasing this challenge is the limitation in experience that is available in the application deployed, leading to a sharp learning curve for medical facilities.

Another challenge of EMR was patient confidentiality and security. These challenges existed independently of the EHR, as a great deal of health data collected from paper records, already exists in repositories electronically. There are documentation of threats in the misuse of these data by well-known experts on personal privacy. There is no hindrance to duplication of paper record, as health records are continuously transmitted through copies and fax among medical institution and companies in the insurance industry already. While some are of the view that the EHR would aggravate these issues, others are of the view that records that are computer-based, with correct

and better security, are potentially protected and at a reduced level of documentation of those who use and have access to them.

EHR are characterized by a lack of coordination. The EHR's technology for EMR has not kept up with that of other Internet services and banking. Every health facility has a unique portal of entry into its database and very different ways of navigation. A clinician working in a single hospital will get proficient with its system. A medical practitioner working in a lot of health institution will carry a small collection of passwords and navigation clues(Birkhead et al, 1991). Another pitfall with EHR systems is system down time. Even though the issue of not accessing the correct data at the correct time is real, the rise in the reliance of computers systems, reduces the problem associated with this.

The challenge associated with the implementation of the EHR in the practice of basic care and areas with poor resource are large and seem to be out of the scope of priority agenda in this time of emergencies of public health. Moreover, the data produced during normal regular medical consultations and is stored in the EHR provides vital information of public health interest. In other places, challenges to the adaptation of EHR are great, but implementing this successfully for a setting that is specific will need a total modeling of the local health practice and a coordination of approach, including all parties involved(Johnson et al, 2004).

2.4 USAGE OF ELECTRONIC HEALTH RECORDS IN DEVELOPED NATIONS

The United States of America, Britain and others have developed and matured healthcare infrastructures that are allocated huge funds from governmental support. Even though substantial failures can still be found in these systems, there is a motivation and strong support in the accomplishment of goals linked with comprehensive development of a successful health data system(Saitwal et al, 2010).

These nations will be able to significantly invest in studies to improve information systems that will meet the requirement of a specific system of health care. There is a vast difference to these infrastructure in healthcare by most developing nations. Challenges including lack of resources, inadequate funds and weak healthcare infrastructure are faced by these developing countries in the implementation of proper healthcare information technology. In the initial introduction of the EHR systems, there was believe that their acceptance broadly will enhance major savings in health care, reduction in medical errors and improvement in health care (Ropovich, 1997). Unfortunately, the progress has been small in the attainment of these successes.

When EMR systems were first introduced, it was widely believed that their broad adoption will lead to major health care savings, reduce medical errors, and improve health, but there has been little progress toward attaining these benefits. The United States trails a number of other countries in the use of EMR systems. Only 15–20 percent of U.S. physicians' offices and 20–25 percent of hospitals have adopted such systems. Barriers to adoption include high costs, lack of certification

and standardization, concerns about privacy, and a disconnection between who pays for EMR systems and who profits from them (Saitwal et al, 2010).

Notwithstanding the attractiveness of EMR, there is suggestion from data available that most of the smaller offices in the United States are not having this technology (Nowel et al, 2001). Example, data from 2003 National Ambulatory Medical Care Survey, Sisk and Burt, stated that averagely, seventeen percent (17 percent) of doctors used EHRs in their office practices (Ropovich, 1997). From 2005 data available from Massachusetts, about eighteen percent (18 percent) of surgical and medical office practices reported using EHRs (Rosonbloom et al, 2008). In contrast, other countries like the United Kingdom and Australia are nearing universal adoption of EMRs (Ropovich, 1997).. Bigger institutions that provide basic care and those with other Hospital Information systems are likely to adopt EHRs. Also in the operation of EMR, most of the system did not include advanced functionalities, including order entry for drugs, laboratory test and results, imaging etc. While more than fifty percent (50 percent) of practices with EMRs had electronic clinical decision support found in them. Most of these clinical practitioners were not using this support actively

In the late 1990's, Newton conducted a research with title "The first implementation of a computerized care planning system in the UK". Included in the implementation are both a new way of organizing work, using the nursing process and a new technology which was the usage of compilers. The outcome revealed that more than a year is needed after implementation to shift the nurses' negative attitude towards the system to a positive one (Johnson et al, 2004). This research revealed an improvement significantly in the quality of care planning. In the review of the usage

of computers in a healthcare setting, Smith et al (2005) discovered that no conclusive proof exist that could help in the provision of the bases for implementing effective strategy for computers. However, the commonly usage of computers in our society nowadays has raised the usage of computers in nursing and also created the possibility for the implementation of standardized care plan in EHR (Saleem et al, 2010).

Goorman and Berg (2000) called attention to problems associated with the design of structures in EMR and suggested that there is a risk that such structures will be difficult to work with in practice. Timmons described nurses' resistance to using computerized systems for planning nursing care; their resistance did not entail direct refusal, but was instead quite subtle. They tended to minimize use of the system or postpone it to another time or to the next work shift.

Timmons considered that the nurses' behavior was characterized by resistance to changes in the nursing process and to the technology (Johnson et al, 2004). Smith and others investigated charting time before and after computer implementation and found that no change had occurred. The advantage of using the software was observed when the technology and the concept brought together the care plans and subsequent documentation. This shows that use of the system improved the function and meaning of the care plan process (Saleem et al, 2010).

Problems linked to the plan of structure in EHR proposed that, there is a risk because such structures will not be simple and easy to work with practically (Johnson et al, 2004). Timmons showed the opposition of nurses to the usage of computerized system for nursing care planning, this opposition did not include direct refusal, but was rather subtle quietly. They planned to reduce

the use of the system or postpone it to the next work shift or a latter time. He looked at the behaviour of nurses was shown by change resistance in the process of nursing and to the technology (Saitwal et al, 2010). Smith et al investigated the chatting time before and after implementation of computers and observed that a change has not happened. The benefit of the software usage was observed when the concept and the technology brought together the care plans and following documentation. This shows that the usage of the system has brought an improvement of the meaning and function of the care plan procedure (Saleem et al, 2010).

2.5 INTRODUCTION AND USE OF EMR IN GHANA

Ghana is a West African Country, with Togo, Ivory, Burkina Faso and the Gulf Of Guinea to its borders, it has a population of 24,658,823 (2010 Population Census). The system of health in Ghana has a basic purpose of improving and maintaining the health results of its citizenry. Recently the system is forced to deal with the increase in cost of service and to attend to increasing pressure to increase services to allow the gap inequity that exists between rural areas and urban areas, the southern and the northern parts of the nation, the poor and the rich to be bridged.

There are better and new opportunities in the acceptance and usage of e-health for progress making in the performance of health sector. It creates the momentum for a better way service is rendered. This change will require a better way information is shared and accessed across the system of

health. It also requires a new approach to the management of patient and the increased usage of the knowledge base existing in the sector to manage health challenges across all borders.

The health sector in Ghana is characterized by a large number of different management units generating and working large data that are held in separate silos. There is difficulty created in information sharing and has been a main factor in the inability of the sector to effectively demonstrate its performance. The several management components need the same platform for information sharing and the only way that can be achieved is through electronic means as shown in figure 2.1.

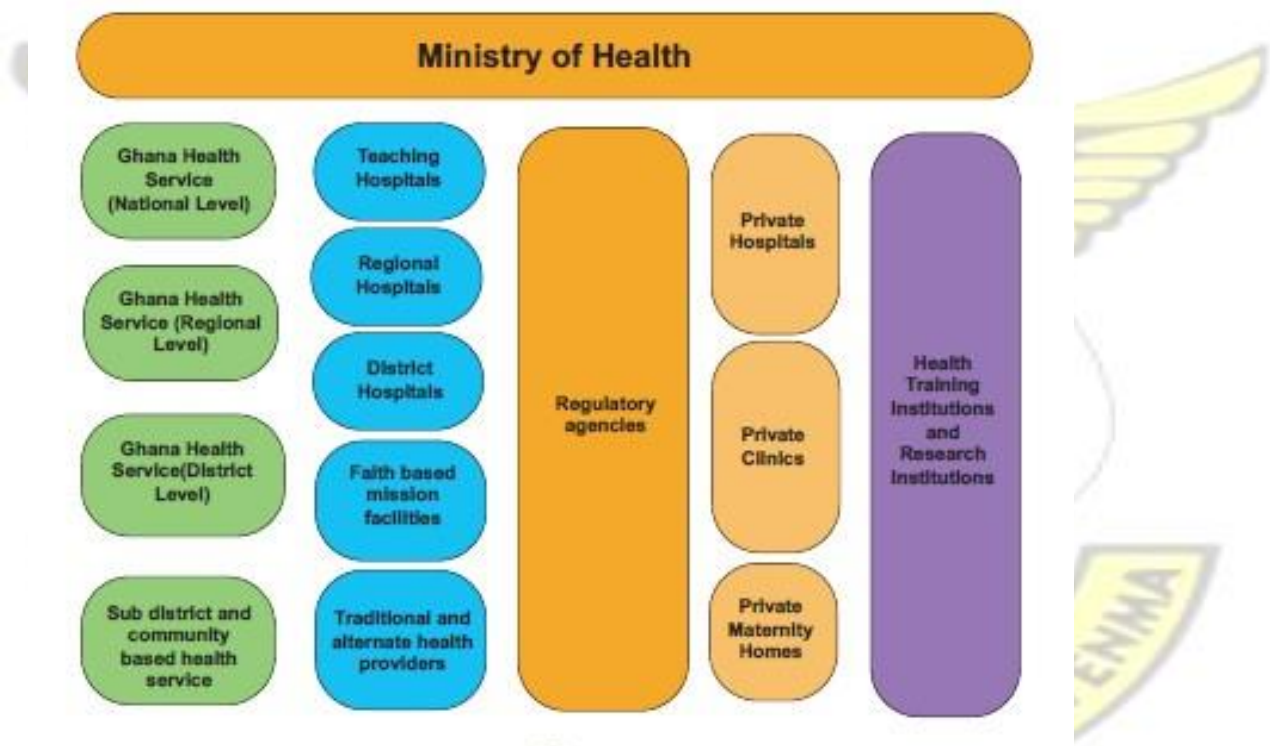


Figure 2.1 : Source: Nation E – Health Strategy , Ghana

Equipment for computing , networking devices, multimedia systems, communication and mobile telephony, internet systems and Imaging equipment form the basis for ICT infrastructure. Most clinical institutions in the nation have multimedia device, computing equipment, communication and internet system, imaging and printing devices(Birkhead et al, 1991). Most infrastructure in the ICT systems had not been fully networked and incorporated in a way that will shore up and help healthcare services within or across institutions. Apart from a few hospitals with a fully working local area network (LAN), there are restrictions by most of the healthcare providers in their LANs only to the front office and pharmaceutical unit of their facilities. The LANs usually support the automation of services in pharmacies services and front office operations like registration of patient and keeping of records.

The health management information system was not commonly used. Currently there are two main applications used for management of information. One of the application was for management of clinical business process whilst the other helps to collect and aggregate information, and is for reporting purpose. The usage of Personal Digital Assistants have been data collection at the community and district levels on pilot basis. The Health Information Management System of the district was basically used to collect information, aggregating and generation of management reports. It has been distributed whole nation.

There are five different software used in the administrative and hospital management. The software applications are modular in nature and do not support the all operations of the health institution. The limits to which these procedures are supported by information systems differ from facility to facility and in their functions . The classification of the hospital functions include patient

documentation of both in and out patients, recording of treatment procedures and records of discharge. Mostly these are paper – based and kept in folders. Important aspects of the patient record in hospitals remain mostly paper-based. Diagnostic and imaging results are not electronically available and can not be accessed from other departments of the hospital(Friede et al, 1995). Prescription history in electronic forms are not available and there is no electronic logistics and supply chain management system in place for non-consumables and medicines. Most of the procedures are manually carried out. There are no systems for generating of electronic health records. This has a significant effect on the arrangements for management and referrals of patients(Birkhead et al, 1991).

Knowing the numerous decisions and complex nature of healthcare delivery that should be taken, sometimes under circumstances that are challenging, the reliance on timely and accurate data becomes very vital. Paper-based records can not offer the leverage and flexibility that Electronic Medical Record provides. The health ministry in Ghana clearly identifies the need for an effective health information management system.

Medical work is a knowledge-intensive, distributed, highly complex, regulated, dynamic and often time-critical activity. In making the treatment of patients possible in these critical time, specialized and physically distributed work settings, health providers persistently needs to interact with each individual(Friede et al, 1995). There should be cooperation in these scattered health work settings between the medical personnel involved. To help this coordination health practices is heavily regulated by conventions and procedures, and also supported by a number of technologies like paper documentation and analogue films used by most health workers for different functions.

Yearly, there is implementation of various policies by the government who is the principal health care service provider in health care delivery development, regrettably these policies have not yielded the necessary success required because of lack of timely and accurate data. On the other hand, most countries that are developed are experiencing improvements in delivery of care by the implementation of varieties of health information systems such as electronic health record, computerized provider order entry and clinical decision systems. It is the purpose of this research to examine the benefits of EHR and contribution to the delivery of health care and its development in a developing nation like Ghana.



CHAPTER THREE

3.0 RESEARCH METHODOLOGY

3.1. INTRODUCTION

This chapter of the research is very important since it is liable to affect the results and conclusions of the study. The chapter considers the methodology and research design used for the research. It also explains the methodology used, the study design, study area, target population, the instrument used, data collection procedure, data analysis, the ethical consideration and problems experienced in the field.

3.2. RESEARCH DESIGN

A research design is the tentative layout of a proposed study or research. As a provisional outline of this action research, the researcher employed a number of strategies to determine the appropriate research design(Birkhead et al, 1991).

The study used qualitative and quantitative research methods. The qualitative research methods considered subjective experiences and observed behaviors of EHR users. Quantitative research methods were used where early stated parameters like personal data and type of profession of users were collected.

To achieve the set objectives of the study, a sample of the staff (medical officers, midwives, nurses, pharmacists, staff of the Record Department) were selected as respondents to the questionnaires.

The researcher generated research data through observing and describing a situation without influences. The data for the study were then analyzed using descriptive techniques like charts, and tables.

The study relied on both primary and secondary source of data. The secondary sources of data were obtained from journals, magazines, newspapers, internet and other published works

3.3 DATA COLLECTION TECHNIQUES/ TOOLS

In order to obtain the required information at the period of the study, numerous data collection tools (triangulation of tools) were used in order to make sure that information given is consistent with what is being practiced. Such tools included observation, questionnaires, interviews and documents written in the past that had a bearing on the study.

In compliance with ethical requirements for research projects, informed consent and assurance of confidentiality was ensured for this study. Approval was also sort from the Research Unit of The Komfo Anokye Teaching Hospital (Appendix II)

3.3.1 QUANTITATIVE STUDY

Sixty (60) questionnaires were carefully designed and administered to respondents to obtain information on the topic under discussion. The questionnaires were written in clear language to enable respondents understand and answer the questions objectively as possible. Respondents were requested to answer every item in the questionnaire. Notwithstanding, the respondents were given little opportunity to express their view as they were restricted to the questions and their corresponding answers. The quantitative component focused on background variables, security of data, patient wait – time, availability of the software and others

3.3.2 QUALITATIVE STUDY

An interview is defined as „a two person conversation initiated by the Interviewer for the specific purpose of obtaining relevant information (Birkhead et al, 1991). During interview, the researcher talked to the respondent and obtains information directly (Birkhead et al, 1991). Some heads of important units (Records and Pharmacy) were interviewed to know how the system is actually used and the problem associated with its usage. This technique actually helped to obtain in-depth information from respondents

3.4 STUDY PLACE, POPULATION, SAMPLING AND DATA COLLECTION

The study was conducted at the Komfo Anokye Teaching Hospital. The Polyclinic Directorate was used since it is one of the main point of entry apart from the Accident And Emergency Unit and other units.

A research population is a group of individuals, persons, objects, or items from which samples are taken for measurement (Britto et al, 2009). The study population involved all health workers in the various units who deal directly with patients or users of the EHR.

The entire hospital population was not feasible, instead part of the population was sampled to ensure reliability and validity of data collection. A total selection of Sixty (60) respondents was drawn from different units and department's database using purposive sampling, quota sampling and simple random sampling. To avoid selection bias it is important to guarantee that each of the candidates for inclusion in the study has an equal opportunity for selection. (Johnson et al, 2004)

3.5 DATA PROCESSING AND ANALYSIS

The quantitative data (information obtained from the questionnaire) were entered, cleaned and processed and analyzed using the Statistical Package for Social Sciences version 17.0 (SPSS version 17.0) Data was collected from the notes made from the recorded interview. The data was categorized into different thematic concerns in relation to the research objective/questions and a report written. This helped because the analysis was based on the needed information, (Johnson et al, 2004) Cross tabulation, descriptive and inferential statistics was used for analysis of the qualitative data according to the order of questions. The relevant information was retrieved in a standard form and the results were presented in frequencies, tables, percentages, exploded pie charts and text. This helped the researcher to make meaningful conclusions for the study. In

analyzing the data, the researcher in some cases compared primary and secondary data to establish any differences. In some cases one complemented the other.

3.6. ETHICAL CONSIDERATION

In compliance with the ethical requirements of research projects informed consent and assurance of confidentiality was ensured for this study. Permission was sought from the health institutions and the purpose of the research was disclosed to the respondents of the questionnaire and the interviews.

3.7. STUDY LIMITATIONS

There were several limitations in this research. Most of the consulting rooms had personal computers installed with a few having the software but the doctors did not use them.

Departments like the wards, X ray department and the laboratories were not using the system.

CHAPTER FOUR

4.0 RESULTS

4.1 INTRODUCTION

To evaluate the results of accessing Electronic Health Records (EHR) usage at Komfo Anokye Teaching Hospital (KATH), this chapter of the study has been designed to cater for the findings, analysis and interpretation of the results. In this particular section, the results of the data collection

exercise were presented analytically in the form of tables and exploded pie charts and bar chart in 3D (three dimensions) with percentages for easy reading and analysis

4.2 AGE DISTRIBUTION OF RESPONDENTS

Age distribution is an indication of the working force in the Hospital Table 4.1 shows that, on the age distribution of the respondents, 11 respondents representing 18.33 percent fell between the ages of 20-25 years, 16 respondents representing 26.67 percent fell within ages 26-30 years, 18 respondents making 30 percent fell between ages 31-35years, 6 respondents representing 10 percent fell between ages 36-40years and 9 respondents representing 15 percent are also between ages 41 and above.

TABLE 4. 1: AGE DISTRIBUTION OF RESPONDENTS

Age	Number of Respondents	Percentage(percent)
20-25yrs	11	18.33
26-30 yrs	16	26.67
30-35yrs	18	30
36-40 yrs	6	10
Over 41 yrs	9	15

4.3 PROFESSIONAL DISTRIBUTION OF RESPONDENTS

With respect to professional distribution of the respondents, Figure 4. 1 identifies the contribution of professional on the EHR. Figure 4.1 shows that a greater percentage of 32 percent of respondents were from Record Officers, 25 percent of respondents were Nurses, 20 percent of respondents were IT staffs, 10 percent of respondents were Pharmacy Staff, 8 percent were Clinicians and 5 percent were other staffs (mainly laboratory staffs and Radiographers)



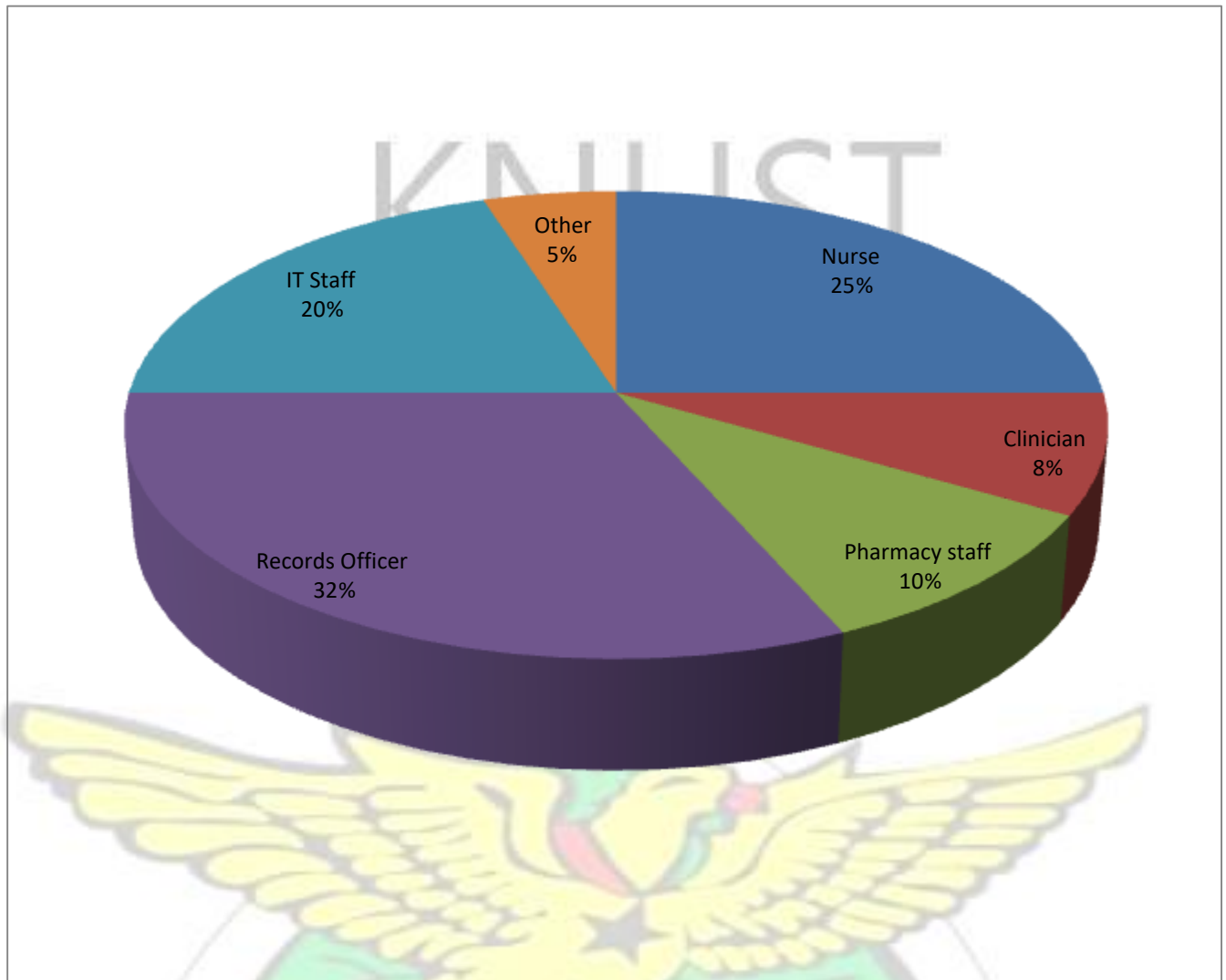


FIGURE 4. 1: PROFESSIONAL DISTRIBUTION OF RESPONDENTS

4.4 EXPERIENCE OF RESPONDENTS

The experience of the respondents is critical in evaluating the quality of decisions in the research as shown in Table 4.2. From the Table 4.2, 5 out of the 60 respondents have worked in the hospital for less than 6 months, 12 respondents have worked in the hospital between 6 – 12 months, 8 respondents have worked in the hospital between 13 – 18 months, 8 respondents have worked in

the hospital between 19 – 25 months and 27 respondents have worked in the hospital for more than 24 months.

Also 6 respondents have used the Paper Based Medical Record for less than 6months, 10 respondents have used it between 6 – 12 months, 9 respondents have used it between 13 – 18 months, 10 respondents have used it between 19 – 24 months and 25 respondents have used it above 24 months

14 respondents have used the Electronic Medical Record for less than 6 months, 14 respondents have used it between 6 – 12 months, 6 people have used it between 13 – 18 months, 6 people have used it between 19 – 24 months and 20 people have used it for more than 24 months as shown in Table 4.2

Table 4.2: EXPERIENCE OF RESPONDENTS

Period	Period worked in the hospital	Period Used the Paper Based Medical Record	Period used the electronic medical record
Less than 6 months	5	6	14
6 – 12 months	12	10	14
13 – 18 months	8	9	6
19 – 24 months	8	10	6
Above 24 months	27	25	20

Total	60	60	60
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4.5 COMPARISON OF THE SPEED OF THE PAPER FORM AND THE ELECTRONIC HEALTH RECORD

Time frame for using the paper – base process as electronic health record process was compared.

Figure 4.2, out of the 15 nurses, 5 nurses believe the EHR is faster, 7 believe the paper form is faster and 3 believe they are both the same. 3 Clinicians believe the EHR is faster, 1 believes the paper form is faster and the other believes they are both the same. 3 pharmacy staff believe the EMR is faster, 1 believes the paper form is faster and 2 believe they are both the same.

16 Records Staff believe the EMR is faster, 2 believe the paper form is faster and 1 believes they are both the same. 9 Information Technology staff believe the EHR is faster and 3 believe the Paper form is faster. 2 respondents from the Others believe the EHR is faster and 1 believes the paper form is faster.

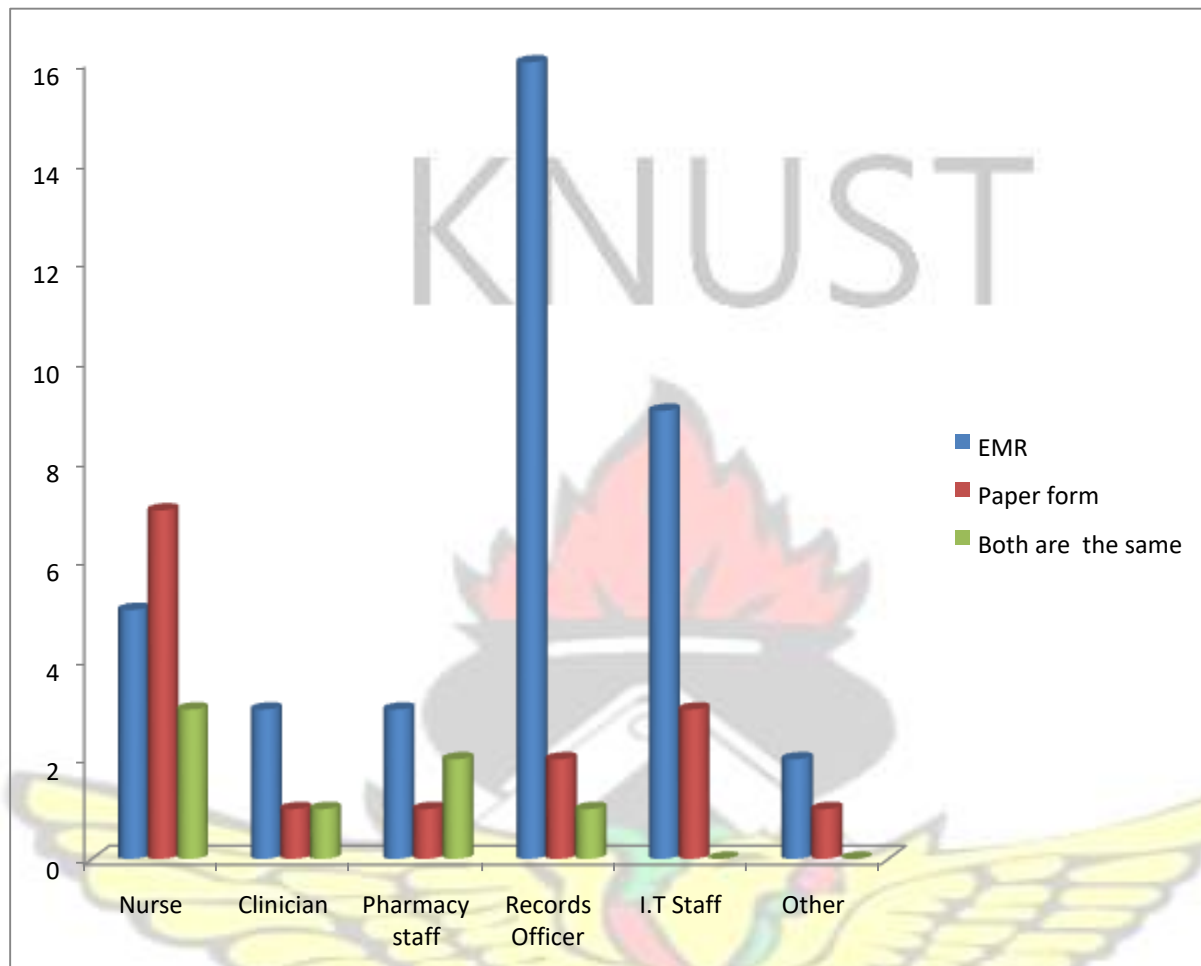


FIGURE 4.2 COMPARISON OF THE SPEED OF THE PAPER FORM AND THE ELECTRONIC HEALTH RECORD

4.6 ACCURACY OF PATIENT INFORMATION

Patient information or data is the most important and critical in the delivery of health. In all cases (normal attendance or emergency) bio data of the patient is needed and will help to know the kind of care to be given. Additional data may also be needed to help the health care provider to know

the right place to direct or take a patient. Accuracy of patient information is very necessary to help in the given of adequate health care.

Figure 4.3, shows that out of the 60 respondents, 8 nurses believe the EMR gives more accurate patient information, 6 nurses believe the paper form gives more accurate patient information and 1 nurse believes they are both the same. 3 Clinicians believe the EMR gives accurate patient information and one believes the paper form gives accurate patient information and one believes they are both the same. 4 pharmacy staffs believe the EMR gives accurate patient information and 1 believes the Paper form gives accurate patient information and the other one believes they are both the same.



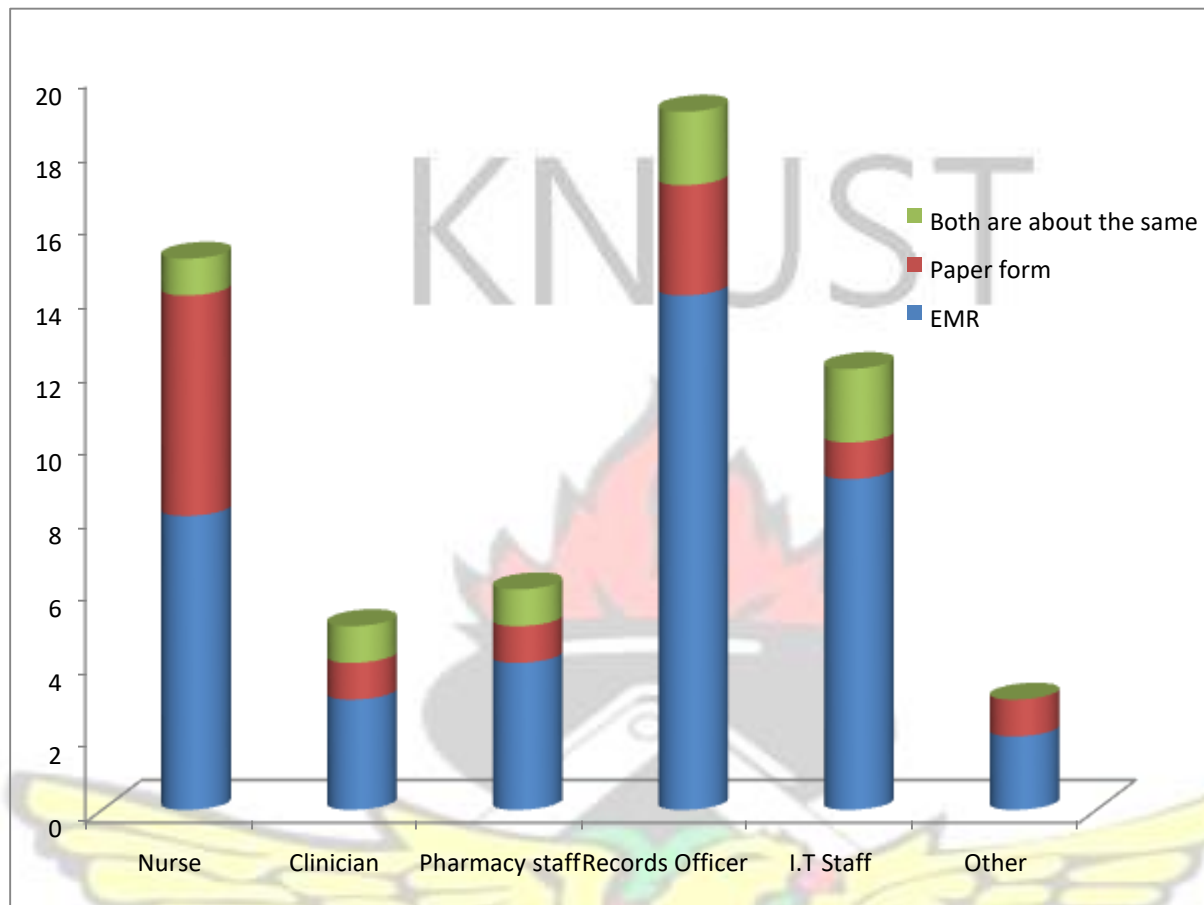


FIGURE 4. 3 ACCURACY OF PATIENT’S INFORMATION

4.7 COMPARING THE SPEED OF THE EHR WITH PAPER RECORDS

In figure 4.4, out of the 60 respondents, a total of 38 respondents believe the EMR is faster when comparing it with the paper form, a total of 15 respondents believe the paper is the faster and 7 respondents believe they are both the same.

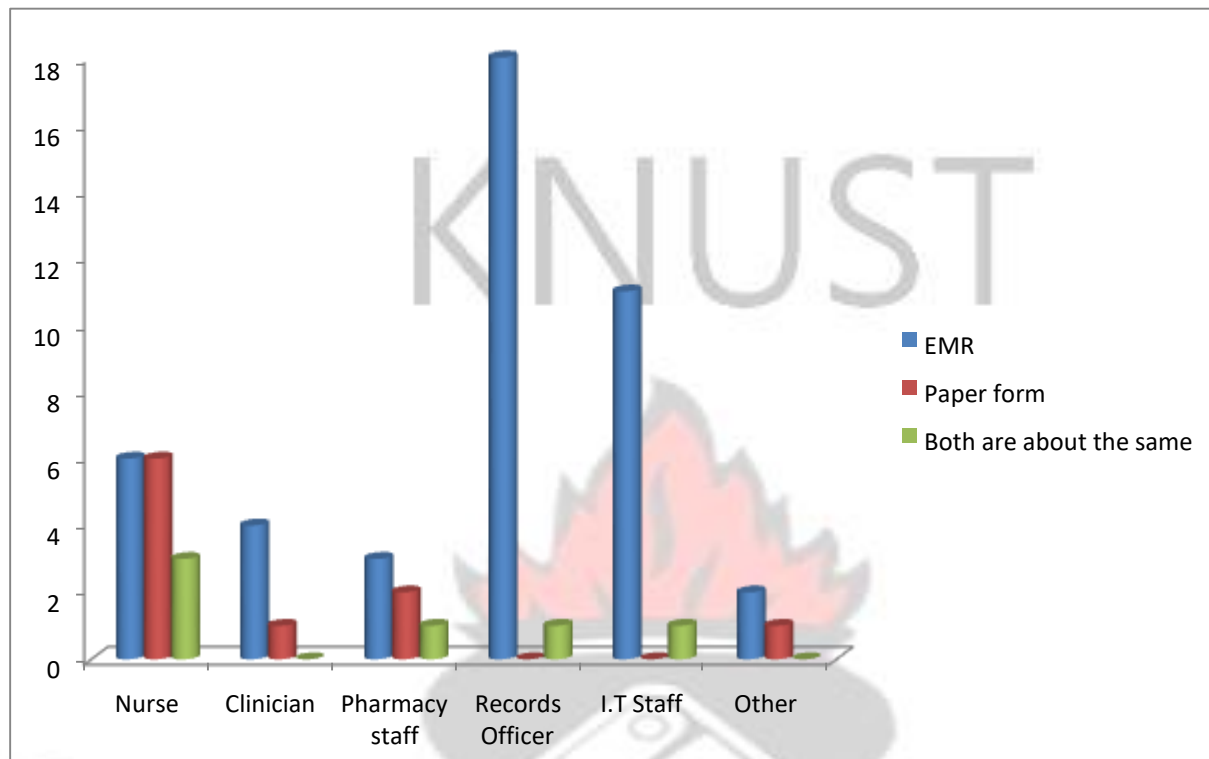


FIGURE 4.4 COMPARING THE SPEED OF THE EHR WITH PAPER RECORDS

4.8 USAGE OF MEDICAL PRO BEFORE HAMS

Figure 4.5, shows 57 percent of the respondents representing 36 respondents have used the old software (Medical Pro) before and 43 percent of the respondents representing 24 respondents never used the old software.

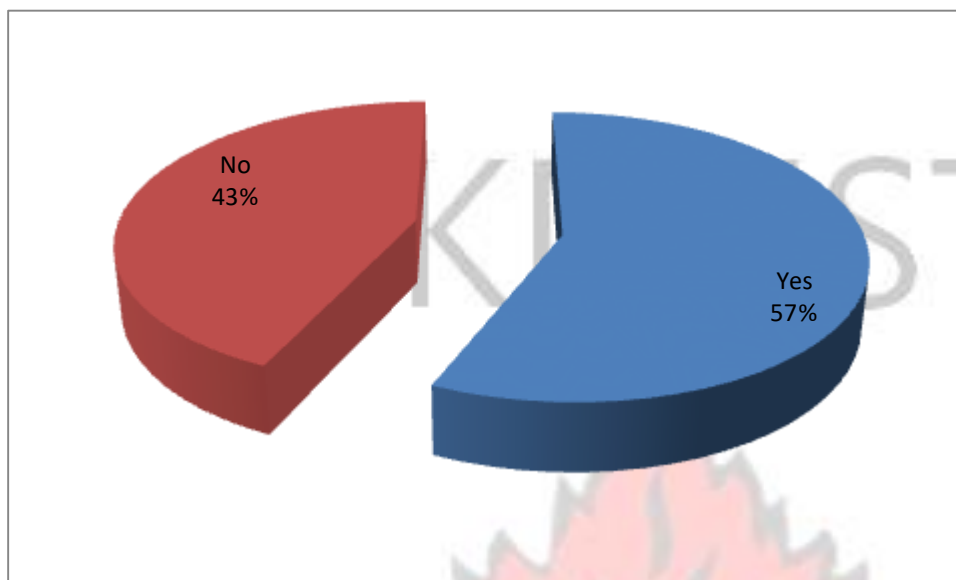


FIGURE 4. 5 USAGE OF MEDICAL PRO BEFORE HAMS

4.9 HOW LONG USERS USED THE MEDICAL PRO

Table 4.3 , shows 6 respondents used Medical Pro for less than 6 months, 7 respondents used it between 6 – 12 months, 3 respondents used it between 13 – 18 months, 5 respondents used it between 19 – 24 months and 13 respondents used it above 24 months

TABLE 4.3 HOW LONG USERS USED THE MEDICAL PRO

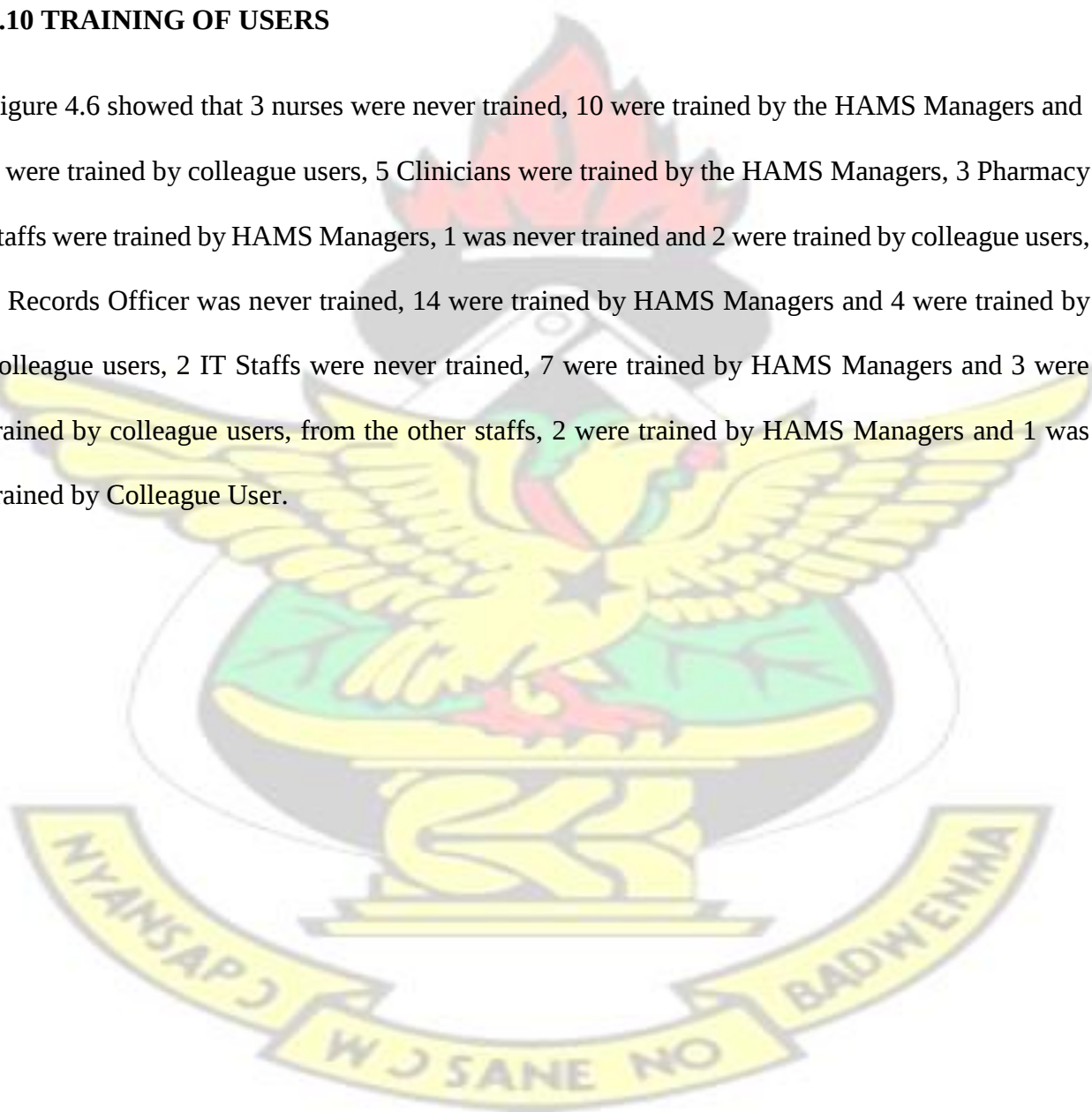
Period	Number of Respondents
Less than 6 months	6
6-12 months	7
13-18 months	3

19-24 months	5
Above 24 months	13

KNUST

4.10 TRAINING OF USERS

Figure 4.6 showed that 3 nurses were never trained, 10 were trained by the HAMS Managers and 2 were trained by colleague users, 5 Clinicians were trained by the HAMS Managers, 3 Pharmacy staffs were trained by HAMS Managers, 1 was never trained and 2 were trained by colleague users, 1 Records Officer was never trained, 14 were trained by HAMS Managers and 4 were trained by colleague users, 2 IT Staffs were never trained, 7 were trained by HAMS Managers and 3 were trained by colleague users, from the other staffs, 2 were trained by HAMS Managers and 1 was trained by Colleague User.



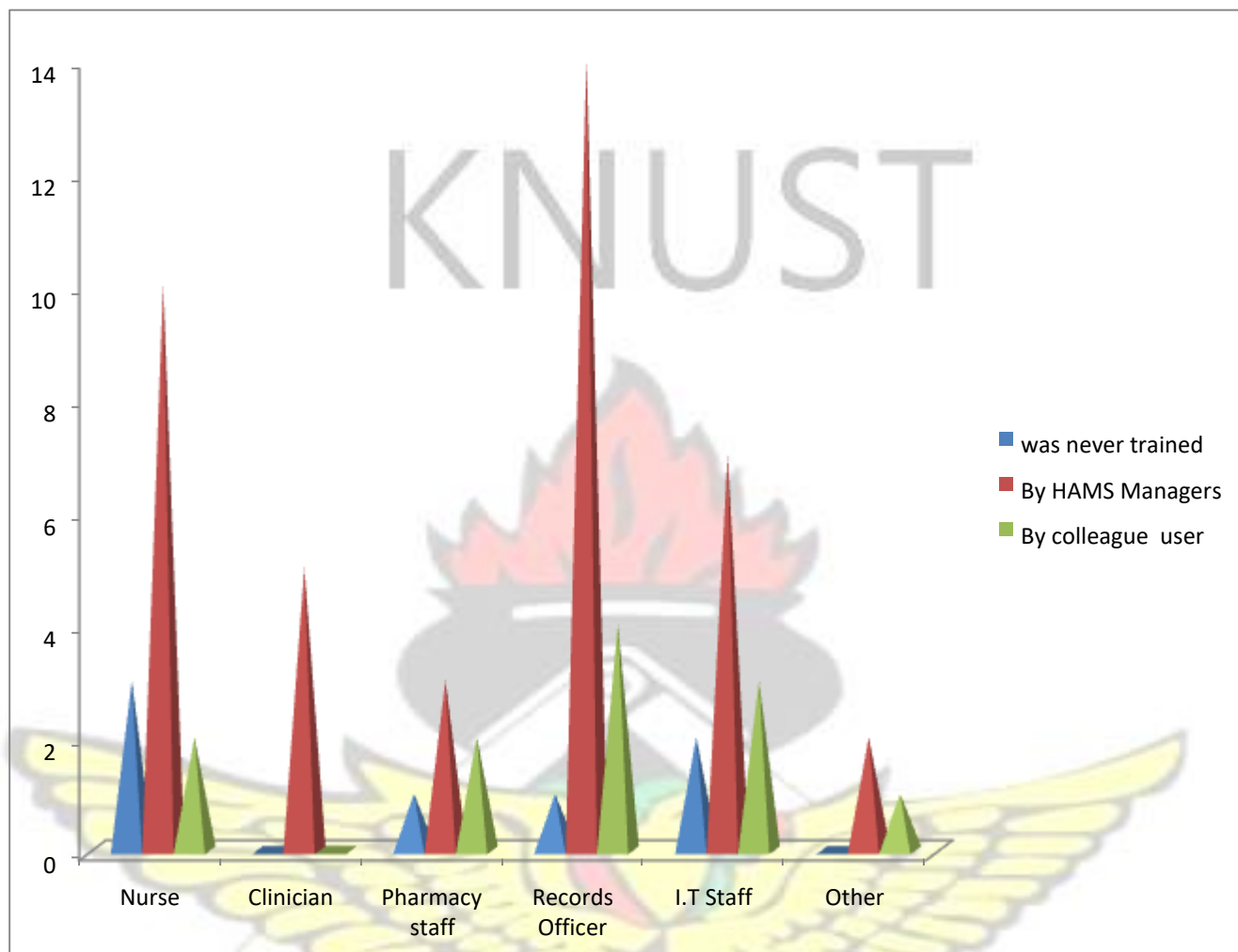


FIGURE 4. 6. TRAINING OF USERS

TABLE 4. 4 REPORT GENERATED FROM THE PAPER FORM

1 AGE GROUP	INSURED PATIENTS						NON-INSURED PATIENTS						TOTAL
	NEW			OLD			NEW			OLD			
	MALE	FEMALE	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE	TOTAL	
<1	94	69	163	28	23	51	71	64	135	10	10	20	369
1- 4	190	140	330	28	27	55	78	84	162	10	15	25	572
4-8	73	45	118	9	15	24	31	21	52	6	5	11	205
9-14	41	39	80	10	12	22	26	18	44	2	2	4	150
15-17	23	47	70	7	14	21	14	29	43	4	3	7	141
18-19	18	63	81	5	20	25	12	29	41	4	3	7	154
20-34	154	775	929	59	212	271	182	304	486	37	62	99	1,785
35-49	144	410	554	58	146	204	113	148	261	41	36	77	1,096
50-59	106	246	352	39	68	107	49	55	104	17	16	33	596
60-69	52	115	167	10	46	56	15	18	33	6	4	10	266
>=70	59	158	217	26	57	83	23	20	43	7	10	17	360
TOTAL	954	2,107	3,061	279	640	919	614	790	1,404	144	166	310	5,694
SUMMARY OF OUT-PATIENTS													
MALARIA CASES													
Number of patients below the age of 5 reporting with													
0 number of patients 5 years and above reporting with													
malaria													
0													

TABLE 4. 5 REPORT GENERATED FROM HAMS

KNUST

OUT PATIENT

Print Time: 12-Jun-2013 12:35 pm

**MINISTRY OF HEALTH
STATEMENT OF OUT-PATIENTS**

Institution: KOMFO ANOKYE TEACHING HOSPITAL Region: ASHANTI District: KUMASI METROPOLITAN From: 21-Mar-2013 To: 12-Jun-2013

Clinic: GENERAL Directorate: POLYCLINIC

AGE GROUP	INSURED PATIENTS						NON-INSURED PATIENTS						TOTAL
	NEW			OLD			NEW			OLD			
	MALE	FEMALE	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE	TOTAL	
<1	107	108	215	55	33	88	94	103	197	14	21	35	535
1-4	208	174	382	74	72	146	145	101	246	25	14	39	813
5-9	62	72	154	10	20	30	42	44	86	11	13	24	302
10-14	56	65	121	14	18	32	52	44	96	12	14	26	275
15-17	30	89	119	18	22	40	22	50	72	3	5	8	239
18-19	31	78	109	12	24	36	26	50	76	2	2	4	225
20-34	255	1,251	1,506	123	481	604	283	510	793	67	116	183	3,086
35-49	169	567	736	104	262	366	184	263	447	55	79	134	1,683
50-59	115	235	350	67	123	190	85	94	179	23	37	60	779
60-69	63	117	180	18	76	94	38	45	83	11	11	22	379
>=70	76	145	221	43	79	122	37	66	103	8	32	40	486
TOTAL ALL AGES	1,192	2,901	4,093	546	1,210	1,756	1,008	1,370	2,378	231	344	575	8,802

SUMMARY OF OUT-PATIENTS MALARIA CASES

Number of Patients below the Age of 5 reporting with Malaria	0
Number of Patients 5 Years and Above reporting with Malaria	0

Medical Officer-in-Charge

To be dispatched not later than the 4th of the month immediately following to the District Director of Health Services.
 Developed By : Infotech Dot Net Systems Limited - Ghana. Tel #s: 03220-27760 / 0244-680669 / 0244035658
 web:www.infotechsystemsonline.com / email: info@infotechsystemsonline.com - Contact us through phone/web for all your ICT Health Solutions!!!

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CHAPTER FIVE

5.0 CONCLUSION AND RECOMMENDATIONS

5.1 INTRODUCTION

In assessing the Electronic Health Records Usage at the Komfo Anokye Teaching Hospital, this last stage of the research is made to rely on the conclusion of the findings made through the use of the data collection instruments in the research. There are also recommendations made by the researcher based on the findings to improve research into this area in future. The objectives of the research were set to break the aim down into more specific, measurable and timely units.

5.2 CONCLUSION

The researched analyzed the approval, training and challenges of EHR users at KATH. Generally, there were challenges with the EHR usage, the greater number of users were content with the system and prefer the Electronic Health Record system usage to paper based one. The research has also found that there has been an improvement in the area of care with the introduction of EHR system and that waiting time of patient at the hospital has reduced by Forty percent (40%). EMR also introduced users to easily generation of multiple reports with the system within a short time (some in a few minutes) as against the paper based system which was only able to generate reports that are limited and would take a long time, work and resources to generate a single particular report. Certain kinds of reports (monthly quarterly, yearly and cohort analysis) would take more days sometimes a week or more to generate using paper based

records.

Efficient and Simple electronic data system can be adopted and established in a nation that is developing like Ghana. The key though to its ultimate success and usefulness is the proper provision and adequate training for all users for sustainability. The EHR system is used to improve patient outcomes and monitor care of the patient. It can also serve as a research tool.

5.3 RECOMMENDATIONS

The recommendations below are made in order to achieve fully the potential benefits from the EHR and can also lead to further research.

- a) The EHR should be extended to other units of the Hospital because only a few Departments like the Main Records and Pharmacy were using the system. Departments like Wards, laboratories, X –ray and even the consulting rooms either are not using the system or partially using the system.
- b) A CDSS should be added and synchronized with EHR to help with major clinical decisions to patients getting the best treatment.
- c) Educate users on system repair, data cleaning and generation of report. Users should be trained more with skills and knowledge in order to use the EHR effectively and independently with minimal support externally.
- d) There is also the need to develop the EHR if possible to be able to give response on what has occurred in the referral of patients.

e) There is the essence to train a lot of staff on EHR because of the large staff population within the Health Institution.

f) There is need to develop user guidelines or manual with all needed trouble shooting and what to do when a problem occurs with the system including the server



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APPENDIX I

Code number.....

QUESTIONNAIRE KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY HEALTH INFORMATICS ELECTRONIC HEALTH RECORDS

INTRODUCTION

This set of questions is to enable the researcher collect data that would enable him contribute to improvement of the Electronic Medical Records (EMR) in the Hospital by investigating how the EMR work in this facility. .

This exercise is purely academic and your contributions would be treated confidentially. Your contribution by way of answering the questionnaire will be highly appreciated.

INSTRUCTIONS

You are requested to tick ☒ in the boxes provided for the appropriate option and provide brief answers to the other spaces provided.

Demographics. First let's start with a little Information about you.

1. Gender:

Male ☐

Female ☐

2. Age:

20-25yrs

☐

26-30 yrs

☐

30-35yrs

☐

36-40 yrs

☐

Over 41 yrs

☐

3. What is your profession?

Nurse

☐

Clinician

☐

- Pharmacy staff ☐
- Records Officer ☐
- IT Staff ☐
- Other ☐ Specify.....

4. How long have you worked in this Hospital?

- Less than 6 months ☐
- 6-12 months ☐
- 13-18 months ☐
- 19-24 months ☐
- Above 24 months ☐

USE OF PAPER BASED RECORDS AND ELECTRONIC MEDICAL RECORDS(EMR)

5. Have you used paper based (patients' card) medical records before?

Yes ☐ No ☐

If yes, for how long have you been using paper based (patients' card) medical records?

- Less than 6 months ☐
- 6-12 months ☐
- 13-18 months ☐
- 19-24 months ☐
- Above 24 months ☐

6. How long have you been using the EMR?

Less than 3 months

☐

4-12 months

☐

13-18 months

☐

19-24 months

☐

Above 24 months

☐

7. Which one is faster and easier to complete between the EMR and Paper based records?

EMR

☐

Paper form

☐

Both are about the same

☐

8. In which is the information about patients more accurate?

EMR

☐

Paper form

☐

Both are about the same

☐

9. In which is the information about patients safer? (Privacy)

EMR

☐

Paper form

☐

Both are about the same

☐

10. In which is the information about patients more complete (no missing data)?

EMR

☐

Paper form

☐

Both are about the same

☐

11. Did you ever use the old software (Medical Pro Software)

Yes ☐

No

☐

If yes, for how long did you use it?

Less than 6 months

☐

6-12 months

☐

13-18 months

☐

19-24 months

☐

Above 24 months

☐

12. How long have you used the new software (HAMS)

.....

13. Which one is user friendly?

Medical Pro Software

☐

HAMS

☐

14. Which one gives accurate and better data?

Medical Pro Software

☐

HAMS

☐

EMR(HAMS) KNOWLEDGE AND TRAINING

15. Who trained you to use the EMR system?

Was never trained

☐

By HAMS Managers(InfoTech)

☐

By colleague users

☐

By other(Specify)

16. How adequately did the training prepare you to use the EMR system? Fully prepared ☐

Mostly prepared ☐

Somewhat prepared ☐

Not at all prepared ☐

Not applicable – I was never trained ☐

17. Did you get enough support from InfoTech after the training?

No support ☐

Some support ☐

Full support ☐

18. What do they support you with?

Data cleaning ☐

System repair ☐

System up grade ☐

Others ☐

Specify.....

19. Do you receive other support from outside other than InfoTech? Yes ☐

No ☐

If yes, please specify the type of support you received.....

EFFICIENCY OF EMR / AVAILABILITY OF EMR

20. When you need to use the EMR, is there always one available for you to use, or do you sometimes have to wait for someone else to finish using it first? I strongly agree

☐

I agree

☐

I somewhat agree

☐

I disagree

☐

I strongly disagree

☐

21. If so, how long do you wait on average?

0-5 minutes

☐

6-10minutes

☐

10-15minutes

☐

More than 15 minutes

☐

22. What is the longest you have ever waited?

0-5 minutes

☐

6-10minutes

☐

10-15minutes

☐

More than 15 minutes

☐

23. Does this waiting discourage you from using the EMR?

Always

☐

Sometimes

☐

Rarely

☐

Never

☐

24. How long (on average) is the wait on line for patients?

- 0-20 minutes ☐
- 21-40 minutes ☐
- 41-60 minutes ☐
- More than 60 minutes ☐

25. Where (which section of patient treatment?) do patients have to wait longer?

- Registration ☐
- Laboratory ☐
- Nurse ☐
- Clinician ☐
- Other ☐ Specify.....

26. Is waiting time for patients any different now with EMR compared to paper based records?

- Shorter ☐
- Same ☐
- Longer ☐

Please explain your answer above.....

27. Think back to the way you did things before the introduction of the EMR, how much has the order in which you see patients using the EMR changed compared to before?

- Significantly ☐
- To a small degree ☐
- Not at all ☐

28. If there is any change, how is patient's waiting time now? Significantly shorter

☐

Shorter

☐

No change

☐

Longer

☐

Significantly longer

☐

29. How has the EMR changed the quality of care to your patients?

Decreased significantly

☐

Decreased a little

☐

Not changed

☐

Improved a little

☐

Improved significantly

☐

EASE OF EMR USE AND ACCEPTABILITY OF EMR SYSTEM

30. Do you ever encounter problems when entering data?

Always

☐

Sometimes

☐

Rarely

☐

Never

☐

If you encounter problems please elaborate.....

31. Between paper based record and EMR, which system do you prefer using?

EMR

☐

Paper based

☐

Any (doesn't matter)

☐

Explain your answer above.....

32. Do you feel EMR is worth the time and effort required to use it?

Yes ☐ No ☐

If yes, please explain how.....

33. Overall, are you satisfied with the EMR system?

Mostly satisfied ☐

Somewhat satisfied ☐

Not at all satisfied ☐

Please explain your answer above.....

IF YOU DON'T GENERATE REPORT BUT YOU ARE A DOCTOR, NURSE OR PHARMACIST PLEASE MOVE TO QUESTION 41

FOR ONLY THOSE RESPONSIBLE FOR COHORTS AND QUARTERLY REPORT GENERATION

34. Do you find EMR reports easier to generate than paper based report?

Always ☐

Sometimes ☐

Rarely ☐

Never ☐

35. How long (over all including data cleaning) does it take to generate a report using EMR?

One day ☐

Two days ☐

Three days ☐

More than three days ☐

36. How long does it take to generate a report from paper based records? One day ☐

Two days ☐

Three days ☐

More than three days ☐

Please explain the difference.....

37. Do you find the reports generated by EMR useful and easy to understand?

Always ☐

Sometimes ☐

Rarely ☐

Never ☐

38. What types of reports are/were you able to extract from paper based records? Monthly report ☐

Quarterly report ☐

Cohort analysis ☐

Patient's treatment report ☐

Others ☐ Specify.....

39. What type of reports are you able to extract from EMR system?

Monthly report ☐

Quarterly report ☐

Cohort analysis ☐

Patient's treatment report ☐

Others ☐ Specify.....

40. How would you compare the accuracy of the manually generated reports to that of the EMR-generated report?

Paper is significantly more accurate ☐

Paper is slightly more accurate ☐

The accuracy of both reports is about the same ☐

The EMR-generated report is slightly more accurate ☐

The EMR-generated report is significantly more accurate ☐

FOR DOCTORS, NURSES AND PHARMACISTS

41. Does the system allow you to enter your diagnosis?

Yes ☐ No ☐

b. If Yes, do you enter the diagnosis?

Always ☐

Sometimes ☐

Rarely ☐

Never ☐

42. Does the system allow you to enter drugs prescribed (e – prescription) ?

Yes ☐ No ☐

b. If Yes, do you enter the drugs prescribed?

Always ☐

Sometimes ☐

Rarely ☐

Never ☐

43. Are you able to request for Laboratory Test, X – ray and other services on the EMR?

Yes ☐ No ☐

b. If Yes, do you request for services using the system?

Always ☐

Sometimes ☐

Rarely ☐

Never ☐

44. Does the EMR help monitor drug interaction?

Some drugs ☐

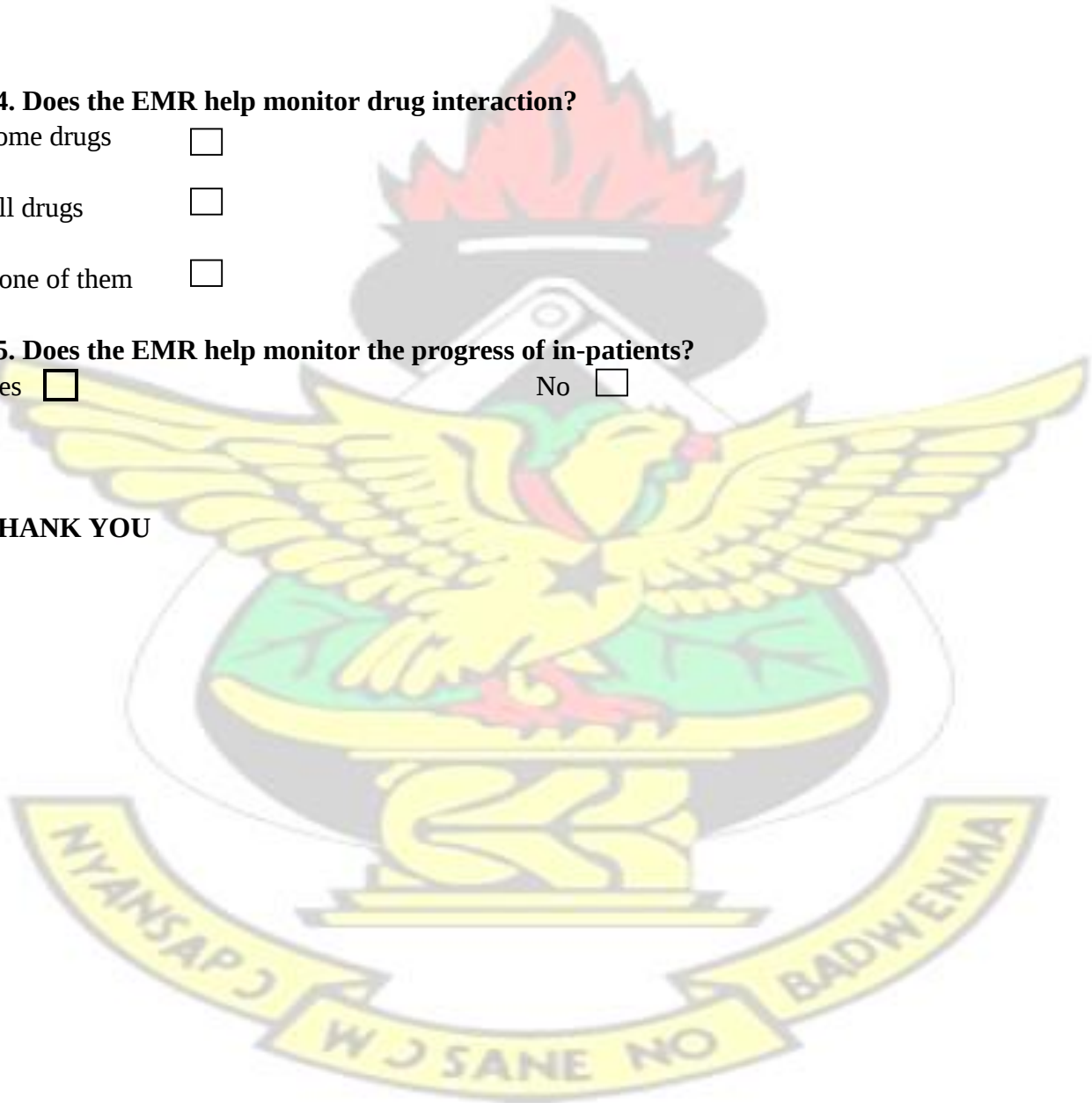
All drugs ☐

None of them ☐

45. Does the EMR help monitor the progress of in-patients?

Yes ☐ No ☐

THANK YOU



APPENDIX II

REGISTRATION AT KATH



KOMFO ANOKYE TEACHING HOSPITAL
RESEARCH AND DEVELOPMENT UNIT (R & D)
CERTIFICATE OF REGISTRATION

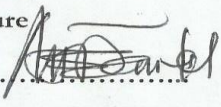
REG. NO^a RD/CR13/0723

This is to certify that

Prof/Dr/Mrs/Mr/Ms Daniel Owusu Nsafoah
has registered his/her proposed study titled Accessing Electronic Health
Records(EHR) usage at Komfo Anokye Teaching Hospital (KATH)
.....
.....with the Research and Development Unit.

Date 15th April, 2013

Name of issuing officer
Dr. Daniel Ansong (Dep. Director, R&D)

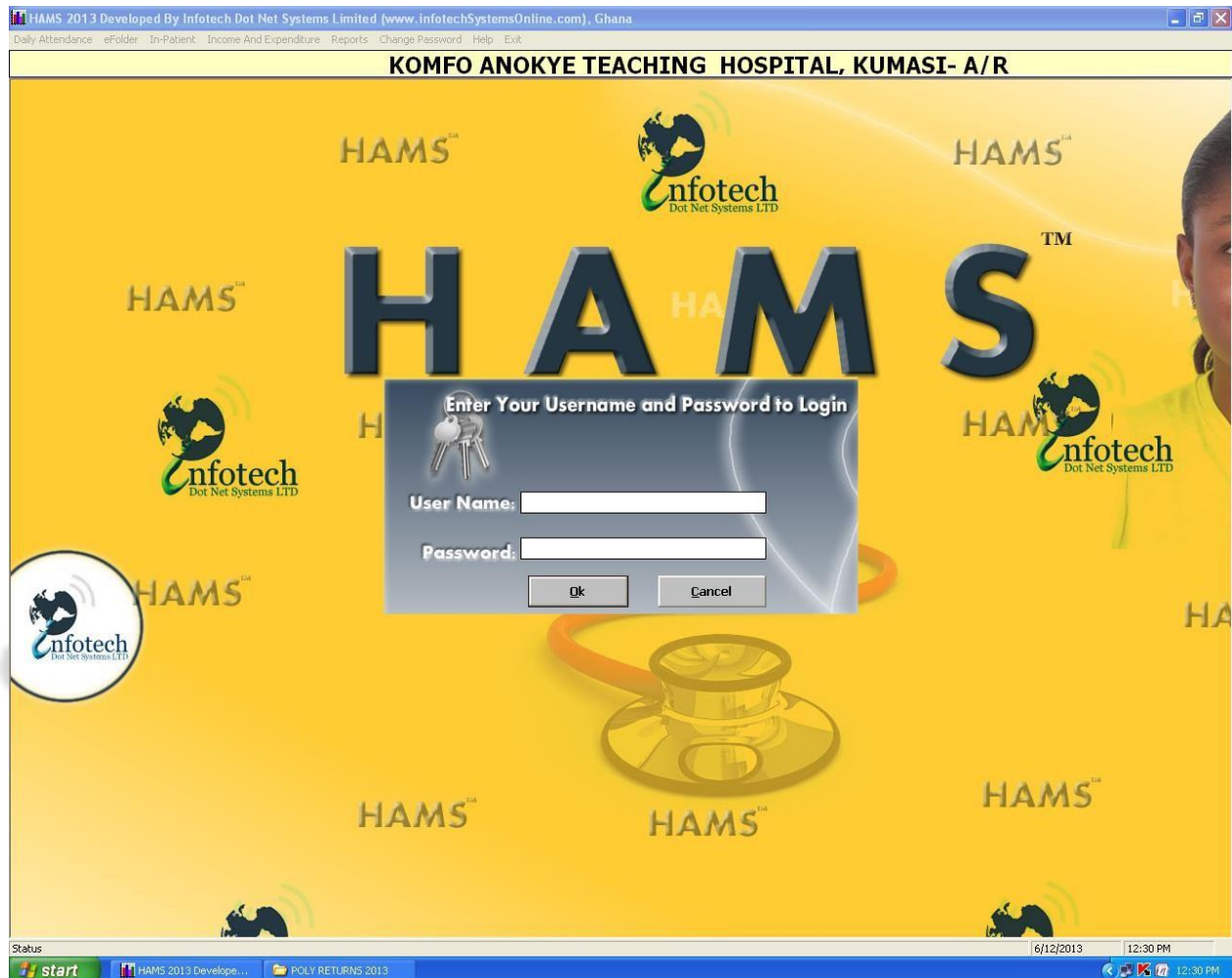
Signature 

^aMust tally with registration number on the registration form

[illegible]

PPENDIX IV

INTERFACE OF THE HAMS FOR A USER



APPENDIX V

INTERFACE FOR ENTERING PATIENT DATA

HAMS 2013 Developed By Infotech Dot Net Systems Limited (www.infotechSystemsOnline.com), Ghana

Daily Attendance eFolder In-Patient Income And Expenditure Reports Change Password Help Exit

KOMFO ANOKYE TEACHING HOSPITAL, KUMASI- A/R

HAMS™

infotech
Dot Net Systems LTD

HAMS™

HAMS™

HAMS 2013 NEW PATIENTS REGISTRATION - [DENNIS SLY-MOORE]

Demographics

Surname: First Name: Middle Name: DOB/Age: 12-Jun-2013

Gender: Married?: Title: Occupation:

OLD OPD #: Nationality: GHANAIAN Category: PRIVATE CASH Religion:

Home Address

Region: ASHANTI District/Municipal/Metro: KUMASI METROPOLITAN Town/City/Village: BANTAMA Home Address:

VIRUS INFORMATION

Scheme: Member ID #: Card Serial #:

Status: PERMANENT Valid From: 12-Jun-2013 Valid To: 12-Jun-2013

Contact Information

Home Tel #: Work Tel #: Cell Phone #: Email Addr:

CONTACT PERSON(S)

Contact Name	Relation	Home Address	Work Address	Home Phone #	Work / Cell Phone

General Information

Clinic: OPD #: IN/OUT: OUT Status: NEW Date: 12-Jun-2013

Folder Location Information

Location: Clinic: Block: Shelf: Barcode:

Save Quick Search Delete Clear Close Advance Search New Clinic Registration For Print Location Tag

Status

start HAMS 2013 Develop... POLY RETURNS 2013 Document1 - Microsof... 6/12/2013 12:31 PM 12:31 PM

APPENDIX VI



The screenshot displays a web-based application window titled "HAMS 2013 MONTHLY GHANA HEALTH SERVICE REPORTS - [DENNIS SLY-MO...]". The window is set against a yellow background with "HAMS" and "infotech" logos. The application interface includes a form with the following elements:

- Report:** A dropdown menu with a list of report types: BED STATES, COMMUNICABLE DISEASE SURVEILLANCE, IN PATIENT, IN PATIENT MORBIDITY, IN PATIENT MORBIDITY AND MORTALITY, IN PATIENT MORTALITY, OUT PATIENT, and OUT PATIENT MORBIDITY.
- From:** 12-Jun-2013
- To:** 12-Jun-2013
- Clinic/Ward:** A text input field.
- Options:**
 - ☒ Preview
 - ☐ Email
- Preview and Print:**
 - ☒ Preview Report
 - ☐ Print Report
- # of Copies:** 1
- Total Pages:** (empty field)
- Paper Size:** (empty field)
- Buttons:** OK, Cancel, Close, and a green "Print Options" button.

The desktop background features the "HAMS" logo and "infotech Dot Net Systems LTD" branding. The taskbar at the bottom shows the Windows Start button and several open applications, including "HAMS 2013 Develop...", "HAMS 2013 MONTH...", "POLY RETURNS 2013", and "Document1 - Microsof...". The system clock indicates the date is 6/12/2013 and the time is 12:33 PM.

APPENDIX VII

