

**FACTORS AFFECTING ACCEPTANCE OF ELECTRONIC MEDICAL
RECORDS SYSTEM IN MURANG'A COUNTY REFERRAL HOSPITAL IN
MURANG'A COUNTY, KENYA**

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DECLARATION

This thesis is my original work and has not been presented for a degree in any other University.

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DEDICATION

I wish to dedicate this thesis to my parents Samuel Muiruri and Mary Wanjiru and my loving wife Ann Muthoni and my sons Eran Muiruri and Jeff Junior Karanja.

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ABBREVIATIONS AND ACRONYMS

| | |
|---------------|--|
| AHF: | Aids Healthcare Foundation |
| CDC: | Center for Disease Control |
| CDH: | County Director of Health |
| EMRs: | Electronic Medical Records |
| FBO: | Faith Based Organization |
| GOK: | Government of Kenya |
| HIS: | Health Information Systems |
| ICT: | Information and Communication Technologies |
| JHA: | Japan Hospital Association |
| MCRH: | Murang'a County Referral Hospital |
| MOH: | Ministry of Health |
| MoICT: | Ministry of Information Communication and Technology |
| SPSS: | Statistical package for Social Sciences |
| USAID: | United States Agency for International Development |

DEFINITION OF OPERATIONAL TERMS

- Capacity:** The ability of the physicians to use electronic medical records system.
- Chi-square:** It's a test that measures how expectations compare to actual observed data or model results.
- Infrastructure:** The basic equipment and structures that are needed for an organization to function properly.
- Krejcie and Morgan table:** It's a table that helps the researcher determine (with 95 percent certainty) the sample size.
- User Perception:** Mental impression of how the physician understands, interprets or regards technology.
- Workload:** The amount of work to assigned and expected to be accomplished by the physicians.

ABSTRACT

The acceptance of Electronic Medical Records systems deployed at healthcare facilities by the government, private institutions and Facility Based Organizations is paramount in achieving the intended outcomes of the systems. However, many systems face acceptance barriers. Many studies have been conducted in other countries to study the factors influencing acceptance and utilization of EMR technology, but still a few number of studies exist in Kenya. This study will seek to find out factors influencing acceptance of electronic medical records system in public health facilities using a case study of Murang'a County Referral Hospital in Murang'a County. Several literature pieces of the works of widely published scholars formed the basis of this study. In this study, the target population was 217 employees on permanent, contract and temporary terms at the Murang'a County Referral Hospital. These were selected from a population of 500 staff. The study objectives in this research was to establish the extent to which; knowledge capacity of staff on ICT, perception of users on Electronic medical Records, availability and status of Electronic medical Records infrastructure and workload influence the acceptability of Electronic Medical Records by users. To choose the participants, Stratified sampling method was used. The tool used in this research was a questionnaire. Both structured and unstructured questions were used. A Pre-test was conducted at Kenneth Matiba Eye and dental Hospital in Kenol Murang'a. The filled questionnaires were first edited for completeness and clarity. Quantitative data analysis was used in the study. The data collected was coded and analyzed using SPSS v20 and Microsoft Excel 2019. Descriptive Statistics using cross tabulation was used to describe the relationship between the independent and dependent variables. The findings showed that majority (61%) of respondents had diploma qualifications as their highest level of education and huge number of respondents (76%) had comparable work experience ranging between 1 and 5 years. The study findings showed that 85% of the respondents were in agreement that EMR quickens clinical decision-making process and another 92% agreed that EMR makes it easier to retrieve medical records. The key finding was that majority of the respondents (81%) felt that it was difficult to create time to study EMR system with ($M=1.2$). As such, so as to enhance acceptance of EMR, Adequate staffing and adequate incentives to Acceptance of EMRs ought to be explored. This research recommends that future endeavors should explore more issues that may encourage the acceptance of EMR.

CHAPTER ONE: INTRODUCTION

1.1 Background to the Study

Electronic medical record (EMR) systems, defined as "an electronic record of health-related information on an individual that can be created, gathered, managed, and consulted by authorized clinicians and staff within one health care organization," have the potential to provide substantial benefits to physicians, clinic practices, and health care organizations. These systems can facilitate workflow and improve the quality of patient care and patient safety. Despite these benefits, widespread Acceptance of EMRs in the United States is low; a recent survey indicated that only 4 percent of ambulatory physicians reported having an extensive, fully functional electronic records system and 13 percent reported having a basic system (Janett & Yeracaris, 2020). With advances in information communication technologies (ICT), EMRs have become the preferred method for records and information management in healthcare (Samadbeik *et al*, 2020). In the last decade, digital and smart technologies have become adequate to manage large data sets in real-time, allowing faster detection and identification of diseases and supporting healthcare ecosystems to rethink their global strategies (Bardhan *et al.*, 2020). A study conducted in US indicated that the current state of EHR usability as measured using a standard technology usability scale is poor and considerably below the usability of many everyday technologies ("The Association Between Perceived Electronic Health Record Usability and Professional Burnout among US Physicians," 2020).

Integrated health services addressing broader determinants of health among individuals, families and communities have exceptional features with distinct data

and information demands that involve appropriate information science answers. In systemic review on factors influencing use of ICT by health professionals, Anna De *et al.*, (2020) concluded that the leading reasons for Acceptance and use of EMRs were perceived usefulness and ease of use. Moreover, there are many studies vouching for improved primary healthcare services and consumer experience as a result of computerized health records (Lee *et al.*, 2018). Additionally, the quest for improved communication among players in the healthcare delivery settings has conversely led to continuous improvement of EMR.

Several studies have found that healthcare professionals' lack of technical knowledge and skills to cope with EMR is one of the most significant obstacles to EMR Acceptance (Acceptance and Utilization of Electronic Health Record Systems by Long-Term Care Facilities in Texas - PMC, n.d.) According to E.L. Abramson the use of EMRs introduces a new type of medical error: typos. EMR is potentially one of the major accelerators in the transformation of healthcare with regard to technology and its acceptance. From a patient care standpoint, EMR generally improves the accuracy of information, supports clinical decision-making and improves the accessibility of information for continuity of care (R & C, 2020). Studies done in middle and low income countries point to limited use of health information decision making. Health workers at institutions in such jurisdictions show that Health Information Systems (HISs) such as EMRs usually act information conduit with seldom application for decision-making in the clinical area and broader patient care endeavors.

As a result possible to emphatically report on Kenyan Acceptance of EMRs and the attendant factors due to paucity of data. In spite of the significance of such undertakings in the health industry, there is paucity of knowledge on their

acceptance in the Kenyan context. This study offers some answers to the current need by exploring the acceptance of EMRs in Murang'a County Referral Hospital. The Kenyan MoH has highlighted on the necessity to better application of information technologies to health. Health Information is one of the investment areas identified in the n ministry's Health Sector Strategic and Investment Plan (2014-2018) for improved orientation and harmonization of health care resources

1.2 Statement of the problem

Uptake of EMR in the Kenyan health care industry is important. Acceptance of EMR is required to reorganize key processes in the health care industry, integrate inter and intra-organizational happenings while keeping expenses at reasonable levels, improve health information as well as prudent programmatic oversight for improved healthcare quality. Acceptance of EMR in Kenyan health facilities is comparably low despite the investments made. In spite of the positive benefits associated with EMR, implementation lethargy persists. Moreover, it is also reported that the failure rate is high among those health facilities that have been in the forefront in EMRs implementation. The United States has seen the deployment of a variety of EMR systems with various degrees of sophistication. Considerable problems have been noted due to a lack of interoperability and standardization of interfaces among these systems, impairing the effective collaboration and information exchange in the care of complex patients (Janett & Yeracaris, 2020). On the other A. Jay Holmgren *et al* (2021), found that manual entry of medical data that was prone to error persisted.

There are rife cases of misplaced or lost paper files. In other instances, some patients may not even remember their unique identifier markers making retrieval of their records challenging. Cases of more than one entry for patients are also not

uncommon when manual files are reported missing. Tracing manual files is laborious and consuming workman hours. Literature is devoid of knowledge on the acceptance of EMR technology. The Kenyan government is aware of the important role played by ICT in achieving her economic blueprint outlined in Vision 2030.

Murang'a County Government has previously rolled out two MR systems previously rolled out two different Electronic Medical Records Systems that didn't work. This study therefore seeks to find out the factors that may have affected the acceptability of the systems in Murang'a County Referral Hospital.

1.3 Justification of the Study

There has been a rise in effectiveness and efficiency in health care delivery arising from the integration of ICT into health care. Application of EMRs in day-to-day operations of public hospitals comes with a lot of benefits including ease of research and proper management of patient data. Despite the many efforts made to computerize the services in the health sector, there has been a great delay in embracing technology. This research seeks to establish why there has been a slow acceptance of technology in the operation of medical services in the health sector. This research may go a long way in facilitating the Ministry of Health, towards eventual standardization of EMRs. The choice of Murang'a County Referral Hospital as a research area is informed by the fact that the hospital is an ideal public hospital offering basic and specialized health services with a catchment population of 1,056,640 (2019 Kenya Population and Housing Census). The facility has also attempted to use electronic methods to manage its operations including offering health care which has never seen the light of the day.

1.4 Research Questions

The research objectives were translated into the following research questions:

- i. To what extent does knowledge capacity of staff on ICT affect their acceptance of EMRs in Murang'a County Referral Hospital (MCRH)?
- ii. To what extent does the users' perception on EMRs affect its acceptability in MCRH?
- iii. To what extent does availability and status of EMRs infrastructure affect its acceptability in MCRH?
- iv. To what extent does the patient workload affect the acceptability of EMRs by the health care workers MCRH?

1.5 Objectives of the Study

The main research objective for this study was to determine factors affecting acceptance of EMRs system in Kenya's public health facilities by health care workers: a case study of Murang'a County Referral Hospital.

This study addresses the following specific objectives

- i. To determine the extent to which the knowledge Capacity of staff affects the acceptance of EMRs in Murang'a County Referral Hospital in Murang'a County.
- ii. To assess the extent to which User Perception by health care workers influence the acceptance of EMRs systems in Murang'a County Referral Hospital in Murang'a County.

- iii. To assess the extent to which the EMRs Infrastructure affects the acceptance of EMRs in Murang'a County Referral Hospital in Murang'a County.
- iv. To establish the extent to which Workload influences the acceptance of EMRs systems in Murang'a County Referral Hospital in Murang'a County by health care workers.

1.6 Limitation and Delimitation

1.6.1 Limitation of the Study

1. Financial constraints- The study may incurred a lot of financial resources as outlined in the budget.

2. Timing of the study- Most of the staff in the hospital set-up were working in different shifts. Some would work in the morning, others in the evening, and others at night while others worked during the weekend. As such proper timing must be put in place to make sure data collection was done at all shifts.

3. Sample profile-Some of the sampled population may were not be willing to respond or disclose the information they have had about the subject matter.

1.6.2 Delimitation of the Study

1. Financial Constraints

This was solved by seeking support from various organizations including the county government of Murang'a and also using the available resources prudently.

2. Timing of the study

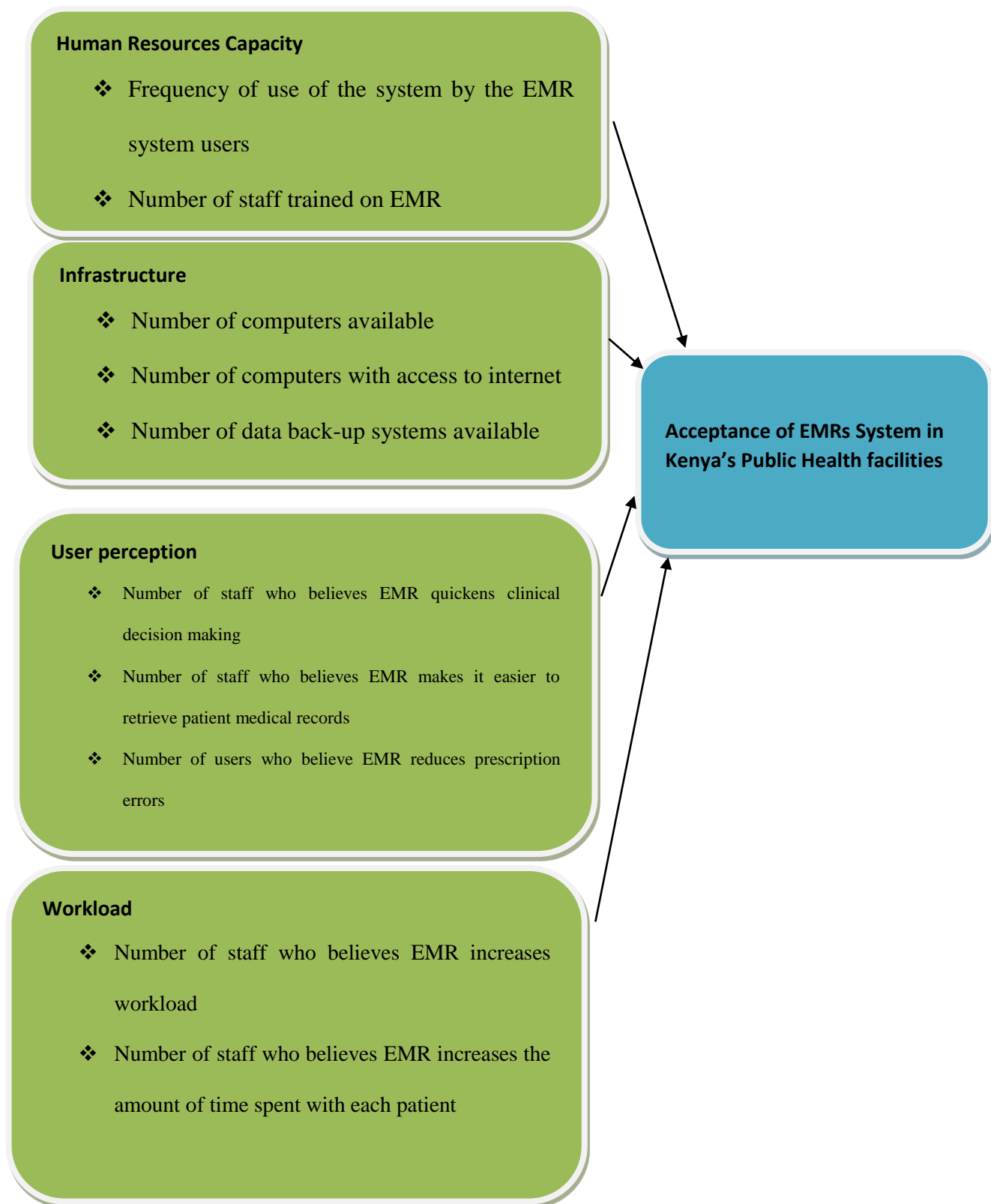
Data collection was conducted during the day and during the night to capture the staffs who work at night and also during the weekend.

3. Sample profile

Proper sensitization was done to every respondent on the purpose and benefit of the study.

1.7 Conceptual Framework

The dependent variable in this study is acceptance of EMRs system in Kenya's public health facilities while independent variables are workload, user perception, health infrastructure and users' capacity.

INDEPENDENT VARIABLES**DEPENDENT VARIABLES****Figure 1.1: Conceptual Framework**

1.8 Significance of the Study

It is anticipated that this study will add to the theoretical matrix for acceptance of EMR systems in a public hospital setting. Regarding the workplace, the results may contribute to appreciation of the key drawbacks to acceptance of EMR systems and serve as a catapult for informed decisions in respect to Acceptance and scale up of EMRs in the country. Frontline health workers are going to benefit from additional skills and knowledge on hands-on operation of electronic machines, this may also help them with ease in management of health records when it is needed. This may also add on efficiency and job satisfaction as the staff take shorter time to access and retrieve records just by clicking buttons on the system as opposed to flipping through files. Moreover, the consumers of healthcare services may enjoy continuity of care, efficiency and effectiveness of services alongside other benefits associated with EMRs. The hospital management may acquire some knowledge from this study on how appropriate and effective management of health information and records support total quality management in healthcare. Health administrators may use the findings to adduce the financial implications for such an undertaking. The findings of this study will bequeath administrators and other sector players to apportion appropriated undertakings to support electronic health. Additionally, this study was beneficial to upcoming scholars and researchers as foundational and reference.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

(Rahman & Al-Borie, 2021) noted that in pursuit for quality improvement, the health industry all over the globe is undertaking reforms to better access and quality of care, optimal return on investment, and consumer encounter. EMR is electronic collection of client's medical information that is computerized. Normally, EMRs are part of HIS, allowing for the health database management (Melton *et al.*, 2021) Embedded in Kenya's economic blue print to develop into a mid-level economy, is digitization of government operations under the tutelage of the ministry of ICT (MoICT). MoICT is mandated to oversee collaboration and synergy in the application of ICT in all aspects of governance in Kenya (MoICT 2019). In the MoH, the country's eHealth development unit is housed in the Division of Monitoring and Evaluation, Health Research Development and Informatics. Presently, there lacks a formal architecture for evaluation of effectiveness and efficiency of eHealth projects in Kenya since the two ministries do not have a collaborative mechanism. Moreover, the ministries do not maintain a centralized registry of all eHealth projects under implementation in the country. In a past eHealth evaluation undertaking, the players used triangulation. This approach combined broad-based partner consultations alongside analyses multiple systemic reviews of research reports focusing on Kenyan eHealth ecosystem. In pursuit of transforming Kenya to a middle-level economy, the government has recognized Science, Technology and Innovation (ST&I) as one of the moving forces and initiated long term development strategies for achieving Vision 2030 as well as Sustainable Development Goals (SDGs).

2.2 Effect of Knowledge Capacity of staff in the acceptance of EMR

Incorporation of ICT in healthcare has made momentous effect on the industry globally. Advantages associated with ICT in healthcare are many. For instance, ICT boosts quality, advances essential healthcare interventions probably mitigating for inadequacies occasioned by health workers (Geng & Demuyakor, 2022) Other benefits include reduction in failures to act and accurate pricing of care while improving service provider effectiveness. These benefits, alongside others not mentioned, have provoked many governments in developed world to allocate substantial resources thus stimulating its acceptance. (Ebrahim A. et al, 2023) Notwithstanding all these benefits, healthcare workers hesitate to integrate computer technology in patient attendance. In many occasions, they would rather use their traditional paper methods instead of technology-supported healthcare documentation. The lingering failure to embrace ICT in healthcare may be attributed to various factors. Clinicians fault the process of obtaining patients records from varied IT software as not part of their training and thus taking a lot time to away from their core business. Moreover, Hlaing Min Oo et al, (2021) noted the correlation between ICT skills and Acceptance of EMRs. EMR are state-of-the-art systems made up of multifaceted hardware and software applications. These systems require skill sets by users (including clinicians). Additionally, technical problems with EMRs put clinicians off. This is attributed to barriers associated with technical competencies of clinicians and system technical capabilities.

2.2.1 ICT skills

The health professionals need to have adequate skills to adopt EMR systems. Studies show that clinicians are not well endowed with ICT skills. As a result many struggle in EMRs usage (Geng & Demuyakor, 2022). Health professionals require

sufficient computer skills to comprehend the concept of EMR. For a fruitful application of e-healthcare, Odenkule and Odenkule (2017) concluded that relevant training of principal users as a viable strategy for improved Acceptance of EMRs since computer literacy was a potent impediment.

2.2.2 Need for professional training

There are rapid changes in ICT. It is paramount for staffs working within the healthcare need to undergo extra and or refresher training on ICT or EMRs system. They also need to be taken through regular refresher courses to make sure they remain relevant in the acceptance of EMR system (Waithera, Muhia & Songole, 2017).

2.2.3 Level of mentorship

There are many staff working within the health care system but only a few can access formal training and organized conferences on EMR. This calls for regular mentorship to the staff who don't have access to such trainings.

2.3 User perception on EMR system use

Acceptance of new technologies at the place of work is influenced by user perception and beliefs. Healthcare worker perceptions and worldview regarding use of EMR systems affects Acceptance. (Rana Melissa Rahal, 2021) noted that there were critical perception differences between physicians who adopted EMR and those who did not with non-adopters claiming that there was no need for EMRs, that they were cumbersome to use, that they were a threat to confidentiality and data security as well as expensive to install. These concerns could be a major hindrance to the implementation of the system.

2.3.1 Stiffness to change

A change is always received with mixed reactions. Some physicians and other users may wish to continue doing paper work including paper prescriptions and lab reports as opposed to changing into EMR. Use of EMR may appear like an extra work and therefore some health professionals may wish to avoid it.

2.3.2 Mistrust in EMRs and acceptance of EMR

There are healthcare workers who are of the opinion that EMRs do not add value to their work and patient outcomes. Weeger and Gewald (2015) noted that personal belief systems played an important role in physician Acceptance of EMR. Another drawback to Acceptance of EMRs by physicians is attributed to their lack of belief that such systems would better their trade or warrant improved the quality of medical practices to their clients (Meigs & Solomon, 2016). These physician personal misgivings on EMRs are synergistic in fueling resistance to EMR Acceptance.

2.4 Infrastructure

Largely, the term infrastructure in ICT refers to all physical and structural apparatuses developed and deployed in a coherent manner to support and or deliver IT services and solutions. IT infrastructure refers to both hardware, software and supportive entities that are foundational to IT service delivery. The Kenyan government appreciates that central to successful implementation and acceptance of eHealth systems is robust infrastructural undertakings embedded by a robust policy environment (MoICT, 2019). It is projected that by 2030 every aspect of life of the ordinary Kenyan will be seamlessly connected to the envisioned digital economy.

Healthcare data sharing is vital to the future of patient-centred care. However, it is challenged by weaknesses inherent in the communication infrastructure that support such data sharing. A key challenge has been pinned on the poor standardization of digital health systems that make up the communication infrastructure thereby affecting the collection, processing, storage and transmission of health data/client's electronic medical records (Alunyu *et al.*, 2023).

The development and establishment of a vigorous ICT infrastructure reinforces progressive evolution in the sector. MoICT reveals that the government commenced infrastructure projects for big data. This calls for enhancement for data storage and use facilities to be developed and supported. Riding on resources and expertise in the private sector, the government in line with its National Broadband Strategy, continues to encourage unrestricted access to effective, competent and reasonable expeditious wireless broadband connectivity.

2.4.1 Availability of computers

The implementation of Electronic Medical Records system requires availability of ICT equipment among being computer. Some government hospitals do not have computers due to security concerns or lack of budget for computers. It's common to find that ICT equipment is not given priority over other things like drugs, non-pharmaceuticals, furniture among others. The computers must also be equipped with appropriate software which need frequent servicing and updating. This means the government was required to employ ICT technicians (Hathaliya et al., 2019)

2.4.2 Internet Connectivity

Currently, internet is being used largely to improve communication and information use. Full implementation of EMRs system require integration between various systems including KHIS (Kenya Health Information System). The government, through its internet connectivity program dubbed 'last mile' connectivity has foreseen laying of fiber cables to all major towns and institutions. This is supplemented by flying cell towers in hard-to-reach areas (CA and ICTA Sign Agreement for Last Mile Fibre Connectivity to 19 Counties | Communications Authority of Kenya, n.d.).

2.5 Influence of Workload on the acceptance of EMR

Issues of workload bring a big barrier to the implementation of Electronic Medical Records system.(Sven Kernebeck, 2022) found that most healthcare workers and managers believed that EMRs will increase their workload adding to their already packed schedule. Staff also decried the lack of support staff for EMR activities and were concerned of transfer of such functions to their already crammed job descriptions. This fear is not unfounded since it is well documented that healthcare

workforce shortage is a reality in low and middle income countries (Boniol *et al.*, 2022).

2.5.1 Time consumed to enter data

During the process of treatment, while using EMR system, the nurse may be required to type the vitals of a patient into the system, the doctor typed the patient history and prescription, and the lab personnel typed the lab results while the pharmacist typed the information on dispensing. This meant that more time was spent in typing.

2.5.2 Time consumed per patient

Individual EMR user-experience varies. Some users may prefer to manual records as compared to computerized records for documenting patient care. This is attributed to perceived lengthy time for data entry into the EMR systems. In using EMR systems, physicians might have to type the required treatment into the system including the prescription. It is alleged that this will probably disrupt the flow of treatment. Physicians were concerned that using EMR systems took time and increased their workload. They were also frustrated by the technical complexity of EMR systems which interfered with user-effectiveness and efficiency.

2.6 Chapter Summary

This review of literature on factors affecting acceptance of EMRs in health care delivery. The review revealed that variables like knowledge and skills, perceptions and workload affect EMRs uptake. The literature has shown that there is continued digitization of government services and existence of enabling environment.

However, despite continued ICT infrastructural policies and investments there remains a gap in linkage between the sector players. Continued ICT transformation and existence of new technologies poses a threat to user knowledge and skills thus requiring continuous user-training. Moreover, physicians are skeptical on the benefits derived from EMRs with concerns that Acceptance of EMRs may translate to increased workload, task shifting as well as infringe on consumer confidentiality and data security.

CHAPTER THREE: MATERIALS AND METHODS

3.1 Introduction

This chapter describes the research design, target population, sampling procedure, data collection methods, research instruments, data analysis, ethical considerations and operationalization of variables. Research methodology is the procedural plan that is adopted by the researcher to validly, objectively, economically and accurately answer the research questions.

3.2 Research Design

This study adopted a cross-sectional descriptive study design to meet the objectives. The study design was also to provide the researcher with wide-ranging, in-depth and genuine information from the actual respondents and also present both qualitative and quantitative data (Mugenda and Mugenda, 2003).

3.3 Variables

The dependent variable in this study was acceptance of EMRs system in Kenya's public health facilities while independent variables were users' knowledge capacity, user perception, health infrastructure and workload.

3.4 Location of the Study

The study was carried out in Murang'a County Referral Hospital. This is the county referral Hospital which is a good representation of the public healthcare services as it offers all the basic health services as well as specialized treatment. The hospital also has EMR systems in its medical and administrative operations. The hospital is located at latitude -0.7320 and longitude 37.15413 within the County headquarter.

3.5 Study Population

The population of this study consisted of medical and paramedical staff working in Murang'a County Referral Hospital. These are people who deal with patients either directly through curative, promotive and preventive services or through management of medical services. This included 171 staff from across 7 cadres.

3.6 Sampling Techniques and Sampling Size

3.6.1 Sampling techniques

The study adopted stratified sampling technique. Stratified sampling is a non-bias method that gave representative data of the target population. This ensured that at least participants from all the departments in the hospital are selected while at the same time every member of the population had equal chance of participating in the study. Below is a table indicating the distribution of the sampled population per cadre.

| S.No | Cadre | No of staff working | Number of Staff sampled |
|------|---|---------------------|-------------------------|
| 1 | Nurses | 200 | 74 |
| 2 | Medical Doctors | 20 | 12 |
| 3 | Lab Technologists | 20 | 14 |
| 4 | Health Records and Information Officers | 28 | 24 |
| 5 | Clinical Officers | 20 | 15 |
| 6 | Clerical Officers | 30 | 17 |
| 7 | Others | 182 | 15 |
| | Total | 500 | 171 |

Table 3.1: Distribution of sampled participants

3.6.2 Sample Size

Out of a population of 500 staff working at Murang'a County Referral Hospital. A sample of 217 employees on various terms of employment were selected for the study. Krejcie and Morgan formula was used.

$$S = \frac{X^2 NP(1-P)}{d^2} + (N-1) + \frac{X^2 P(1-P)}{d^2}$$

S= Required sample size

X²= The table value of chi-square for 1 degree of freedom at the desired confidence level (3.841)

N= Population size

P= The population proportion (assumed to be 50 since this would provide the maximum sample size)

d= The degree of accuracy expressed as a proportion (0.5)

3.7 Data collection tools

Self-administered questionnaire (Appendix II) was used for data collection. The questionnaire included a range of items that covered adequately all the research questions. Both structured and unstructured questionnaires was used.

3.8 Pre-Test

Using the Kenneth Matiba Eye and dental Hospital in Kenol Murang'a, as a pre-test site, 10 questionnaires were distributed to health workers located in that Hospital. This is a public Hospital that has been using EMR in some of its operations. The results assured the research team of the validity of the research instrument and the ability of the tool to deliver on the desired outcomes.

3.8.1 Validity of the Research Instruments

Structured questionnaires were used because they are specific in the kind of responses elicited and are perfect for a large group of respondents within time and resource constraints. Biases and prejudices in responses are also reduced or avoided. Questionnaires are excellent in minimizing respondent biases and prejudices since one can only respond to items using provided alternatives.

3.8.2 Reliability of the Research Instruments

The consistency of the instrument was established by conducting a pre-test of Kenneth Matiba Eye and dental Hospital in Kenol Murang'a. Ten questionnaires were distributed to the respondents located in that Hospital. Internal consistency reliability estimate was given by Cronbach Alpha reliability coefficient of a minimum of 0.7 or higher which is agreed "acceptable" for exploratory or pre-test studies (Whitley 2009; Robinson 2002; Hinton *et al.*, 2004).

3.9 Data Collection Techniques

The various departments in the hospital were used as strata for sample selection. Data collection was done by administering the questionnaires to the sampled population as per the selection criteria in *figure 2*.

3.10 Data Analysis

Questionnaires and data were coded and checked for completeness. The data entered in Microsoft excel (2010). This was later uploaded to IBM's Statistical Package for Social Scientists (SPSS) version 20 software. The data obtained from the research instruments was summarized using descriptive statistics. Frequencies, percentages, and means were used. The results were presented in distribution tables and figures for ease of explanation.

3.11 Logistical and Ethical Considerations

The proposal was submitted to Kenyatta University graduate school for consideration and approval. It was also be submitted to an Ethical Review Committee before approval for commencement of the study.

The researcher wrote an introductory letter to respondents was attached to the questionnaire assuring them that the research was purely for academic purposes. The research processes and procedures were conducted in conformity with ethical requirements for respect for human dignity and study protocols involving human subjects. Participation was on free-will after informed consent. Furthermore, respondents were free to opt-out at whatever point they wished. Moreover, the research employed an effective study design with a sample selection that was appropriate for the purpose of the study. The researcher sought consent from the County Director of Health (CDH) from Murang'a County before administering the study.

CHAPTER FOUR: RESULTS

4.1 Introduction

This section presents data collected, results and discussions of the study findings on the factors affecting acceptance of EMRs system in Kenya's public health facilities by health care workers based on the case of Murang'a County Referral Hospital. Data were collected by administering questionnaires to health care workers in the facility. A total of 217 employees on various terms of employment at the Murang'a County Referral Hospital were sampled. The data obtained were analyzed and put in form of frequency tables, percentages, and averages. The presentation and discussions are in line with the study objectives.

In summary, a total of 171 responses were obtained, representing a 79% return rate from the targeted sample. This was way above what Mugenda and Mugenda (2003) recommends thus it was appropriate to proceed with data analysis.

| S.No | Cadre | Number of Staff | (Percentage) % |
|------|---|-----------------|----------------|
| 1 | Nurses | 74 | 43% |
| 2 | Medical Doctors | 12 | 7% |
| 3 | Lab Technologists | 14 | 8% |
| 4 | Health Records and Information Officers | 24 | 14% |
| 5 | Clinical Officers | 15 | 9% |
| 6 | Clerical Officers | 17 | 10% |
| 7 | Others | 15 | 9% |
| | Total | 171 | 100% |

Table 4.1: Cadre distribution table

4.2 Effect of Capacity in the Acceptance of EMR

Regarding effect of capacity of employees on acceptance of EMRs systems in Murang'a County Referral Hospital, the respondents were asked to state the extent to which the knowledge Capacity of staff influences the acceptance of EMRs systems. The results are presented in table 4.2.

Table 4.2: Effect of Capacity on use of EMR

| | 1 | 2 | 3 | 4 | 5 | Mean |
|---|------|------|------|-----|-----|------|
| Commitment to EMR implementation by management | 22.1 | 42.9 | 32.9 | 0 | 2.1 | 3.08 |
| EMR vendor follow-up on the usage of resources and facilities | 15.4 | 44.2 | 28.8 | 2.7 | 9 | 2.96 |
| Training on EMR usage & operations | 26.7 | 37.9 | 22.9 | 4.5 | 8 | 2.74 |
| Awareness forums on EMR Acceptance | 15.4 | 44.2 | 28.8 | 2.7 | 9 | 2.45 |
| Outreach programs for EMR | 7.1 | 12.5 | 20 | 7.5 | 53 | 2.30 |

Key: 1 = Strongly Disagree 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree

Source: Author (2022)

The results show that the respondents considered commitment of management to implementation of EMRs remained neutral (M=3.08) with the role played by EMR vendors being rated as favorable (M=2.96). Moreover, respondents were undecided on the impact of training on EMR usage and operations (M=2.74). Health care workers felt that there were no awareness forums on EMR Acceptance (M=2.45) as well as outreach programmes for EMR (M=2.30).

4.3 Effect of User Perception in Acceptance of EMR

The study sought to assess how User Perception by health care workers influences the acceptance of EMRs system in Murang'a County Referral Hospital in Murang'a County. The results are as shown in table 4.3:

Table 4.3: Effect of Perception on Acceptance of EMR systems

| | 1 | 2 | 3 | 4 | 5 | Mean |
|--|----------|----------|----------|----------|----------|-------------|
| An EMR system quickens the process of clinical decision-making | 0 | 1 | 14 | 53 | 32 | 4.15 |
| EMR system makes retrieval of medical records easier | 1 | 1 | 6 | 46 | 46 | 4.33 |
| EMR reduces patient waiting | 1 | 1 | 14 | 46 | 38 | 4.17 |
| EMR improves confidentiality of patients' records | 0 | 0 | 8 | 47 | 44 | 4.36 |
| EMR system can help reduce medication/prescription errors | 0 | 0 | 8 | 39 | 53 | 4.44 |
| EMR makes it easy to maintain a patient appointment system | 0 | 1 | 10 | 40 | 49 | 4.36 |
| EMR system can improve the patients' overall quality of care | 1 | 17 | 14 | 48 | 20 | 4.26 |
| I prefer an EMR system for my day-to-day operations | 1 | 0 | 11 | 38 | 50 | 4.34 |
| I feel much in control while using paper-based system than EMR | 25 | 21 | 19 | 14 | 21 | 2.85 |
| Changeover to EMR will affect with my general output | 36 | 40 | 14 | 3 | 7 | 2.04 |
| EMR assure me of patient information safety | 48 | 34 | 11 | 2 | 5 | 1.88 |

Key: 1 = Strongly Disagree 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree

Source: Author (2022)

The study findings showed that 85% of the respondents were in agreement that EMR quickens clinical decision-making process and another 92% agreed that EMR makes it easier to retrieve medical records. Regarding patient waiting time, 84% of the respondents agreed that EMR reduced patient waiting time. Additionally, 88% of the respondents implied that they preferred using EMR for their day-to-day operations. Conversely, 76% disagreed that switching from paper based to EMR system will affect their general performance. On the area of confidentiality and medical errors, 91% of the respondents agreed that EMR will positively address each of them. On whether EMR improved quality of care, only 68% of the

respondents agreed with 18% disagreeing. When asked on whether EMR improved security of patient information, majority of the respondents (82%) disagreed.

4.3.1 Demographic Characteristics of the Respondents and infrastructure

The demographic characteristics of the respondents were analyzed and summarized as shown in table 4.4.

Table 4.4: Demographic Characteristics of the Sampled Respondents

| | Category | Frequency (f) | Percentage (%) |
|-------------------------|--------------------------|---------------|----------------|
| Age | Under 29 | 19 | 11 |
| | 30 – 39 years | 87 | 51 |
| | 40 – 49 years | 65 | 38 |
| Gender | Male | 92 | 54 |
| | Female | 79 | 46 |
| Education Level | Certificate | 2 | 1 |
| | Diploma | 104 | 61 |
| | Graduate | 43 | 25 |
| | Post Graduate | 22 | 13 |
| Years of Experience | Less than one year | 17 | 10 |
| | 1 – 5 years | 130 | 76 |
| | 6 – 10 years | 24 | 14 |
| Level of Acceptance | Fully electronic | 36 | 21 |
| | Hybrid (Both) | 62 | 36 |
| | None (Fully paper-based) | 73 | 43 |
| Level of Competence | No Knowledge | 11 | 6 |
| | Basic users | 53 | 31 |
| | Intermediate users | 77 | 45 |
| | Advanced users | 30 | 18 |
| Any Training on EMRS | Yes | 141 | 82 |
| | No | 30 | 18 |
| Computers in Department | Yes | 155 | 91 |
| | No | 16 | 9 |

Source: Author (2022)

Based on the study findings, most (54%) of the respondents were male, while some (46%) were female. The study further revealed that most (51%) of the respondents were aged between 30 -39 years of age, while some (38%) while 11% were aged under 29 years.

Regarding level of education, the results reveal respondents had diverse qualifications with 1% having the least level of qualifications as their highest level of education. Majority (61%) of respondents had diploma qualifications as their highest level of education and 25% had a first degree as their highest level of education. The remaining 13% had attained post-graduate education. Majority of the respondents were of good level of education.

The study also examined the years of experience of the sampled respondents, and it was noted that 10 % of the respondents had been at the facility for less than one year. A huge number of respondents (76%) had comparable work experience ranging between 1 and 5 years while the remaining 14 % had work experience of between 6 and 10 years. Most of the respondents had work experience of over one year. This showed that all the respondents were knowledgeable on patient interactions.

This study revealed 82% of the respondents had received some training on EMRs and 91% had computers in their departments. It further showed that 21% were wholly using EMR systems in their departments, 36% are currently using a combined system such as paper and electronic systems, while 43% were not using any EMR system. These results show that there was less than average use of EMRs system in the health facility.

Regarding of competence of use, six percent indicated that they had no knowledge on use of EMRs; 31% of the respondents reported that they had basic competence while 45% indicated that they had intermediate competence in using the EMR system. Additionally, 20% of the respondents rated their use of EMR as advanced. These results show that majority (94%) of respondents were skillful users of EMRs.

4.4 Effect of Workload in the Acceptance of EMR

The study sought to establish how Workload influences the acceptance of EMR systems in Murang'a County Referral Hospital in Murang'a County by health care workers. The results are as shown in table 4.5.

Table 4.5: Influence of workload and the Acceptance of EMR

| | 1 | 2 | 3 | 4 | 5 | Mean |
|--|-----|-----|-----|-----|-----|------|
| Daily workload is overwhelming in this department | 0% | 17% | 30% | 40% | 13% | 3.6 |
| In this department we have adequate staff to offer the services required | 25% | 34% | 12% | 23% | 9% | 2.7 |
| In this department, the work schedule (shift) helps to reduce the daily workload | 1% | 31% | 42% | 17% | 9% | 2.2 |
| Using the EMR system increases the amount of time spent with each patient | 0% | 1% | 40% | 35% | 25% | 2.6 |
| I mostly work beyond my working hours because of high daily Patient's turn-up. | 6% | 11% | 29% | 41% | 12% | 3.6 |
| I find it easy to spare time to learn the EMR system. | 46% | 35% | 17% | 2% | 0% | 1.2 |
| Acceptance of EMR system will increase workload. | 13% | 30% | 40% | 16% | 1% | 2.0 |

Key: 1 = Strongly Disagree 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree
Source: Author (2022)

From the findings in table 4.5, out of the 171 respondents, most (53%) agreed that the daily workload is overwhelming (M=3.6) and that they worked beyond working hours due to high daily patient turn-ups (M=3.6). Majority of the respondents (81%) felt that it was difficult to create time to study EMR system with (M=1.2). Most staff were ambivalent about staff adequacy in their various departments (M=2.7) and whether work scheduling increased workload (M=2.6). Most of the respondents were not sure whether EMR system increased the time spent with each patient (M=2.6) though they were of contrary view that Acceptance of EMR system will increase the overall workload (M=2.0).

CHAPTER FIVE: DISCUSSION, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This section discusses findings of the study, draws conclusions, and makes recommendations and suggestions for further research. The general objective of this study was to investigate factors affecting acceptance of electronic medical records system in Kenya's public health facilities by health care workers in Murang'a County Referral Hospital. This study's discussions were done principally in line with the study objectives.

5.2 Discussion

Embracing EMRs is critical to rationalizing essential processes in the health care industry, unite happenings across various health care organizations, cut down health care expenses, and improve health information and health program management for improved patient care outcomes. Retrieval of files uses a lot of time and consumes lots of workman hours. There exists a knowledge gap in the literature on embracing EMRs among various cadres of healthcare professionals. The Kenyan government being cognizant of the essential role played by in realizing the Vision 2030 economic blueprint has made tremendous investments and policy declarations in the sector. Notwithstanding the potentials and interest in EMRs worldwide in regard to quality improvement, the overall take-up rate is relatively low, and are faced with several challenges.

Therefore, this study sought to investigate factors affecting acceptance of EMRs system in Kenya's public health facilities by health care workers in Murang'a

County Referral Hospital. The specific objectives were to; i) To establish the extent to which the knowledge Capacity of staff affects the acceptance of EMR systems, ii) To assess the extent to which the EMRs Infrastructure affect the acceptance of EMR systems, iii) To assess the extent to which user perception by health care workers influence the acceptance of EMR systems, and iv) To find out the degree to which workload affects the acceptance of EMRs systems.

The first objective of this study was to establish the extent to which the knowledge Capacity of staff affects the acceptance of EMR systems. The study findings showed that the majority (94%) of the sampled respondents reported that they had varied competency in the use of EMR system with only 6% indicating that they lacked working knowledge of EMRs. This is consistent with a research by (Jones & Camp, 2019).

Most of the respondents indicated that management was committed to EMR implementation (M=3.08), follow-up support by implementing vendors was good (M=2.96) and that the training received by hospital staff on EMRs had good impact on usage of the same (M=2.74). Conversely, EMR awareness forums on Acceptance (M=2.45) and outreach programs on EMR (M=2.30) were not exploited as favorable avenues for fostering Acceptance.

The Second objective of the study was to assess the extent to which user perception by health care workers affected acceptance of EMR systems. The findings revealed that most respondents strongly agreed that; implementing EMR system can help reduce medication/prescription errors (M=4.44), improve confidentiality (M=4.36), and eases maintaining appointment system (M=4.36). Additionally, most respondents preferred using EMRs system for their day-to-day operations as

opposed to using paper-based system (M=4.34) and where of the opinion that such a system reduced patient waiting time (M=4.17). In contrast, when asked whether they felt at ease when using paper-based system as compared to EMRs in managing patient records most were negative (M=2.85). Moreover, they never felt that transitioning to EMRs interfered with their overall performance (M=2.04). Incidentally, most of the respondents were dissuaded that EMRs would compromise the security of patient information (M=1.88)

The study's third objective was to assess how the EMRs Infrastructure influences the acceptance of EMR systems. According to the study findings majority (91%) reported having a computer in their department, of whom 80% reported that they had full access to the computer every time they were on duty.(Ilie *et al.*, 2009)

The fourth and last objective of the study was to establish the extent to which workload affects the acceptance of EMR systems. According to the study findings, a good number (53%) concurred that workload is overwhelming (M=4.26) and had to work beyond their shift hours due to increase patient turn-up (M=3.6). additionally, they felt that using EMRs could also increase their workload (M=2.6). Regarding staff, majority of the respondents (59%) disagreed that their departments had adequate staff for the daily tasks. Moreover, Work scheduling was not making it any better as it compounded the workload (M=2.2). Most of the respondents (81%) disagreed that they were able to spare time to learn EMRs.(*Barriers to the Acceptance of Electronic Medical Records by Physicians from Systematic Review to Taxonomy and Interventions / BMC Health Services Research / Full Text*, 2010.)

5.3 Conclusion

The study examined how knowledge capacity, EMR infrastructure, user perception and workload affected the Acceptance of EMR systems in public health facility in Kenya's Murang'a County. The study was successful in addressing the research objectives and the research questions. Following the study findings presented and discussed above, the study conclusions are as follows:

Knowledge was a crucial contributor to Acceptance of the EMR system. This agrees with other research findings. For example, Dutta and Hwang (2020) and Kruse et al (2018) in systematic review of the literature on EMRs observed that physicians were hesitant to adopt EMRs due to concerns on system complexities and technical knowhow.

Regarding data confidentiality and security, healthcare workers in this study were concerned that patient confidentiality and data security were not assured with EMRs. This may be because of misunderstanding of ICT security systems as well as mistrust between users and vendors. Keshta and Odeh (2021) noted that despite the benefits associated with EMRs and desire by many governments to adopt the same, uptake has been relatively low majorly due to concerns related to patient confidentiality and data security. As advances are made in the HER technology, so are the intricacies and complexities on threats to data security and information confidentiality.

Further, the findings indicated that presence of EMR infrastructure affected Acceptance of EMR. Alongside other factors, Lee et al (2018), Oumer *et al* (2014) and Almarzouqu, Aburayya and Sallum (2022), found infrastructure to be key in the success of implementing EMRs. Also, the findings indicated that user perception

influenced Acceptance of EMR. Fraser and others (2022) noted that favorable user perception was a strong motivator in Acceptance and successful continued use of EMRs even in situations where resources were limited. Enhancement of user involvement in EMR implementation was found to be a mitigating factor to user perception (Chirchir *et al.*, 2021).

Workload related factors were found to influence and correlated to the Acceptance of EMR. In the current study, staff decried the shortage of staff as compared to the prevailing workload and concerns that Acceptance of EMRs would lead to increased workload. This is in agreement with the findings Kruse *et al* (2018) and Dutta and Hwang (2020) in which physicians wondered that Acceptance of EMR would increase their workload. This may be partly due to lack of involvement of users during conceptualization and sourcing of EMRs systems.

5.4 Recommendations

5.4.1 Recommendation for the study

The results from this research have policy propositions on the input and output in the public health sector. Consequently, from the findings on the factors affecting acceptance of electronic medical records system in Kenya's public health facilities by health care workers, the subsequent recommendations were made as follows;

- i. It is envisioned that by mainstreaming EHR/EMR content in basic healthcare curricula will entrench them to the health sector. This will promote the acceptance of EMR by all health workers. Continuous and follow-up training should be domiciled in all health facilities to provide required EMR technical assistance. This will improve user confidence while at the same time allowing health workers adequate

involvement to be competent in using the EMR system. Involvement of healthcare workers in conceptualization, Acceptance and revision of EMRs systems should be encouraged so as to minimize mistrust of vendors.

- ii. Guidelines on data privacy and security ought to be developed and enforced. Vendors, users and beneficiaries including patients should be trained on their roles, rights and obligations regarding data security. Continuous improvement to ward off malicious attacks and other threats should be explored and financed.
- iii. Adequate staffing and adequate incentives to Acceptance of EMRs ought to be explored. Probably this might mitigate for workload burden.

5.4.2 Recommendation for Further Research

Because studies explore original information, the findings of this study are not exhaustive due to vibrant transformations in electronic data management, especially EMRs systems. This study focused on factors affecting the acceptance of EMRs system in Kenya's public health facilities; this research recommends that future endeavors should explore more issues that may encourage the acceptance of EMR.

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APPENDICES**Appendix I: Letter of Introduction**

Dear Respondents,

You are invited to participate in this Case study of “ACCEPTANCE of electronic medical records system in Murang’a County Referral Hospital”. The aim of the study is to investigate the Challenges to acceptance of Electronic Medical Record systems at Murang’a County Referral Hospital. The study will also recommend interventions to the said challenges. Each respondent to the case study will receive a copy of the report containing the study's findings and recommendations. The individual responses to the study will be kept strictly confidential and data will only be used in aggregate. I will greatly appreciate your participation and look forward to working with you in this important research endeavor.

Yours Sincerely,

Geoffrey Karanja

MSC (HIM) Student

Kenyatta University

Appendix II: Questionnaire

Section One: General Information

| S.No | Question | Answer |
|------|---|---|
| Q1 | Sex | <input type="checkbox"/> Male <input type="checkbox"/> Female <input type="checkbox"/> Intersex |
| Q2 | Your Age | |
| Q3 | What is your highest education level | <input type="checkbox"/> High school <input type="checkbox"/> Certificate <input type="checkbox"/> Diploma <input type="checkbox"/> Bachelor's degree <input type="checkbox"/> Postgraduate degree |
| Q4 | In which department do you work | <input type="checkbox"/> MCH <input type="checkbox"/> Medical Records <input type="checkbox"/> OPD <input type="checkbox"/> Maternity <input type="checkbox"/> Laboratory <input type="checkbox"/> Public Health <input type="checkbox"/> Finance <input type="checkbox"/> Pharmacy <input type="checkbox"/> CCC <input type="checkbox"/> Clinic <input type="checkbox"/> NHIF <input type="checkbox"/> HTS <input type="checkbox"/> Clinic <input type="checkbox"/> Administration |
| Q5 | For how long have you been working in this facility | <input type="checkbox"/> Less than 1 year <input type="checkbox"/> 1-5 years <input type="checkbox"/> 6-10 years <input type="checkbox"/> More than 10 years |

| | | |
|----|---|---|
| Q6 | What is the level of EMR system in your department | <input type="checkbox"/> Management of health records in this department is fully electronic <input type="checkbox"/> Management of health records in this department is hybrid <input type="checkbox"/> We do not have electronic medical records in this department |
| Q7 | Kindly estimate your level of competence in using the EMR system in your department | <input type="checkbox"/> I am a basic user (Basic competence) <input type="checkbox"/> I am an intermediate user <input type="checkbox"/> I am an advanced user <input type="checkbox"/> I have no skills/competence |

(Please tick (✓) the appropriate answer.

Section two: Knowledge capacity of staff to use Electronic Medical Records

Please estimate your level of knowledge and operation of the following computer applications. Please tick (✓) the appropriate answer.

Use the scale of: 1 = strongly disagree, 2 = disagree, 3 = uncertain, 4 = agree, 5 = strongly agree

| | Question | 1 | 2 | 3 | 4 | 5 |
|-----|-----------------------------------|---|---|---|---|---|
| Q8 | I am competent in using MS Word | | | | | |
| Q9 | I am competent in using MS Excel | | | | | |
| Q10 | I am competent in using MS Access | | | | | |

Q11. Please choose one response that best describes your internet usage

a) I use internet services atleast once every week

- b) I use internet services atleast once a month
- c) I rarely use internet (a month can go without using internet services)
- d) I do not use internet services at all

Q12. Please choose one response that best describes your typing skills

- a) I am slow in typing
- b) I am relatively fast in typing
- c) I consider myself quite fast in typing

Q13. Have you received any form of training course on Electronic Medical Records software?

Yes No

If your answer is NO in the above question, skip to section three, otherwise answer question Q14 below.

Q14. Have you received any further follow-up mentorship after the first formal training?

Yes No

Please gauge the implementation of Electronic Medical Record system in your department. Please tick (√) the appropriate answer. Use the scale of: 1 = very poor, 2 = poor, 3 = average, 4 = good, and 5 = very good.

| | | 1 | 2 | 3 | 4 | 5 |
|-----|-------------------------------|---|---|---|---|---|
| Q15 | Level of training provided | | | | | |
| Q16 | Ease of use of the EMR system | | | | | |
| Q17 | Follow-up mentorship provided | | | | | |

SECTION 3: Availability and status of Electronic Medical Records Infrastructure

Q18. Is there a computer(s) in your department?

Yes No

Please point out the extent to which you agree with each of the following statements.

Please tick (✓) the appropriate answer. Use the scale of: 5= strongly disagree, 4= disagree, 3= neutral 2= agree and 1= strongly agree

| | | 1 | 2 | 3 | 4 | 5 |
|-----|---|---|---|---|---|---|
| Q19 | I have full access to a computer every day | | | | | |
| Q20 | I have full access to a printer whenever I need | | | | | |

Q21. Are computers in this department linked via local area networks?

Yes No

Q22. Do computers in this department have access to internet.

Yes No

Q23. Is the computer room burglar proofed – windows and doors?

Yes No

Q24. Are there systems to secure the computers within the room(s) e.g. lockable cages, chains etc.

Yes No

Q25. Has there been an incidence of theft of EMR equipment in the last 6 months?

Yes No

Q26. There is a records back-up system that ensures easier retrieval of patient records/information.

Yes No

SECTION 4: Perception of users on Electronic Medical Records.

In your views, please rate the extent to which you agree with the following statements. Please tick (√) the appropriate answer. Use the scale of: 1 = strongly disagree, 2 = disagree, 3 = uncertain, 4 = agree, 5 = strongly agree

| | | 1 | 2 | 3 | 4 | 5 |
|-----|--|---|---|---|---|---|
| Q27 | An EMR system quickens the process of clinical decision-making | | | | | |
| Q28 | An EMR system makes it easier to retrieve patients past medical records | | | | | |
| Q29 | With an EMR system the patient waiting time is shortened | | | | | |
| Q30 | Implementing an EMR system improves confidentiality of patients records | | | | | |
| Q31 | EMR system can help reduce medication/prescription errors | | | | | |
| Q32 | It is much easier to maintain a patient appointment system records using EMR than paper-based system | | | | | |
| Q33 | EMR system can improve the overall quality of care offered to patients. | | | | | |
| Q34 | I prefer an EMR system for my day-to-day operations than using paper-based record systems | | | | | |
| Q35 | I feel much in control while using paper-based patient records than using EMR | | | | | |
| Q36 | Transitioning from paper-based system to EMR will | | | | | |

| | | | | | | |
|-----|---|--|--|--|--|--|
| | interfere with my overall performance. | | | | | |
| Q37 | I am <i>NOT</i> assured of the security of the patient information in the EMR system. | | | | | |

SECTION 5: Effects of workload on the use of Electronic Medical Records.

Rate the following in terms of workload towards EMR acceptance. Please tick (√) the appropriate Answer. Use the scale of: 1 = strongly disagree, 2 = disagree, 3 = uncertain, 4 = agree, 5 = strongly agree

| | | 1 | 2 | 3 | 4 | 5 |
|-----|--|---|---|---|---|---|
| Q38 | In this department, the daily workload is overwhelming | | | | | |
| Q39 | The number of staff in this department is adequate enough to offer the services required | | | | | |
| Q40 | In this department, the work schedule (shift) helps to reduce the daily workload? | | | | | |
| Q41 | Using the EMR system increases the amount of time spent with each patient | | | | | |
| Q42 | I always work beyond my working hours because of high daily Patient's turn-up. | | | | | |
| Q43 | I find it easy to spare time to learn the EMR system. | | | | | |
| Q44 | Acceptance of EMR system will increase workload. | | | | | |

Appendix III: Kenyatta University Research Proposal Approval



KENYATTA UNIVERSITY GRADUATE SCHOOL

E-mail: dean-graduate@ku.ac.ke

P.O. Box 43844, 00100
NAIROBI, KENYA
Tel. 020-8704150

Website: www.ku.ac.ke

Internal Memo

FROM: Dean, Graduate School

DATE: 2nd September, 2021

TO: Geoffrey Karanja Muiruri
C/o Health Management & Informatics

REF: Q141/CTY/PT/28887/2015

SUBJECT: APPROVAL OF RESEARCH PROPOSAL
=====

This is to inform you that Graduate School Board, at its meeting of 25th August, 2021, approved your Research Proposal for the M.Sc. Degree Entitled, "Factors Influencing Acceptance of Electronic Medical Records System in Murang'a County Referral Hospital in Murang'a County, Kenya".

You may now proceed with data collection, subject to clearance with the Director General, National Commission for Science, Technology and Innovation.

As you embark on your data collection, please note that you will be required to submit to Graduate School completed Supervision Tracking forms per semester. The form has been developed to replace the progress report forms. The supervision Tracking Forms are available at the University's website under Graduate School webpage downloads.

Thank you.


JULIA GITU
FOR: DEAN, GRADUATE SCHOOL



CC. Chairman, Department of Health Management and Informatics

Supervisors:

1. Dr. George Otieno
C/o Department of Health Management & Informatics
Kenyatta University
2. Dr. Josephat Kiongo
Chuka University
C/o Health Management & Informatics
Kenyatta University

Appendix IV: Kenyatta University Research Authorization Approval



KENYATTA UNIVERSITY GRADUATE SCHOOL

E-mail: dean-graduate@ku.ac.ke

Website: www.ku.ac.ke

P.O. Box 43844, 00100
NAIROBI, KENYA
Tel. 020-8704150

Our Ref: Q141/CTY/PT/28887/2015

DATE: 2nd September, 2021

Director General,
National Commission for Science, Technology
& Innovation
P.O Box 36023-00100
NAIROBI

Dear Sir/Madam,

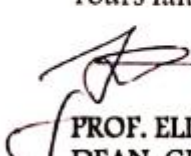

RE: RESEARCH AUTHORIZATION FOR GEOFFREY KARANJA MUIRURI– REG. NO. Q141/CTY/PT/28887/2015

I write to introduce Mr. Geoffrey Karanja Muiruri who is a Postgraduate Student of this University. He is registered for M.Sc. degree programme in the Department of Health Management and Informatics.

Mr. Muiruri intends to conduct research for a M.Sc. Proposal entitled, “Factors Influencing Acceptance of Electronic Medical Records System in Murang’a County Referral Hospital in Murang’a County, Kenya”.

Any assistance given will be highly appreciated.

Yours faithfully,



PROF. ELISHIBA KIMANI
DEAN, GRADUATE SCHOOL

Ji/nn

Appendix V: Kenyatta University Ethical Review Committee Approval



**KENYATTA UNIVERSITY
CENTRE FOR RESEARCH ETHICS AND SAFETY**

Fax: 8711242/8711575
Email: chairman.kuerc@ku.ac.ke
Nairobi, 00100

P. O. Box 43844,

Tel: 8710901/12

Website: www.ku.ac.ke
Our Ref: **KU/ERC/APPROVAL/VOL.1**

Date: 12th /11/2021

Geofrey Karanja
P.O BOX 43844-00100
Nairobi.

Dear Mr.Karanja,

APPLICATION NUMBER: PKU/2376/I1513 FACTORS INFLUENCING ACCEPTANCE OF ELECTRONIC MEDICAL RECORDS SYSTEM IN MURANG'A COUNTY REFERRAL HOSPITAL IN MURANG'A COUNTY, KENYA

This is to inform you that **KENYATTA UNIVERSITY ETHICS REVIEW COMMITTEE** has reviewed and approved your above research proposal. Your application approval number is **PKU/2376/I1513**. The approval period is 12th /11/2021 to 12th/11/2022.

This approval is subject to compliance with the following requirements;

- i. Only approved documents including (informed consents, study instruments, MTA) will be used
- ii. All changes including (amendments, deviations, and violations) are submitted for review and approval by **KENYATTA UNIVERSITY ETHICS REVIEW COMMITTEE**
- iii. Death and life threatening problems and serious adverse events or unexpected adverse events whether related or unrelated to the study must be reported to **KENYATTA UNIVERSITY ETHICS REVIEW COMMITTEE** within 72 hours of notification
- iv. Any changes, anticipated or otherwise that may increase the risks or affected safety or welfare of study participants and others or affect the integrity of the research must be reported to **KENYATTA UNIVERSITY ETHICS REVIEW COMMITTEE** within 72 hours
- v. Clearance for export of biological specimens must be obtained from relevant institutions.
- vi. Submission of a request for renewal of approval at least 60 days prior to expiry of the approval period. Attach a comprehensive progress report to support the renewal.

vii. Submission of an executive summary report within 90 days upon completion of the study to **KENYATTA UNIVERSITY ETHICS REVIEW COMMITTEE**

Prior to commencing your study, you will be expected to obtain a research license from National Commission for Science, Technology and Innovation (NACOSTI) <https://research-portal.nacosti.go.ke> and also obtain other clearances needed.

To serve you better, researchers are kindly requested to access and complete a customer feedback form and sent it back online as you continue with research and upon completion of data collection found on the following website link; https://docs.google.com/forms/d/1ytWefDwvyz5h1oz_VIn0xbxg3uGdIDzMXFWNDsM7RPQ/edit?usp=sharing


Yours sincerely




Prof. Judith Kimiywe

Director: Centre for Research Ethics and Safety


Appendix VI: NACOSTI Approval


REPUBLIC OF KENYA


NATIONAL COMMISSION FOR
SCIENCE, TECHNOLOGY & INNOVATION

Ref No: 280258 Date of Issue: 13/January/2022


RESEARCH LICENSE




This is to Certify that Mr.. Geoffrey Karanja Mairuri of Kenyatta University, has been licensed to conduct research in Muranga on the topic: FACTORS INFLUENCING ACCEPTANCE OF ELECTRONIC MEDICAL RECORDS SYSTEM IN MURANG'A COUNTY REFERRAL HOSPITAL IN MURANG'A COUNTY, KENYA for the period ending : 13/January/2023.

License No: NACOSTI/P/22/15112

280258
Applicant Identification Number


Director General
NATIONAL COMMISSION FOR
SCIENCE, TECHNOLOGY &
INNOVATION

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