INSTITUTIONAL DETERMINANTS AND IMPLEMENTATION OF ELECTRONIC MEDICAL RECORDS IN GOVERNMENT HIV CLINICS: A CASE OF NAIROBI CITY COUNTY, KENYA.

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DECLARATION

This project report is my original work and has not been submitted to any university for any award.

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This research project report has been submitted for examination with my approval as university supervisor.

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DEDICATION

I dedicate this research project firstly to all the healthcare professionals and their selfless sacrifices in providing timely and quality care. I also dedicate my work to my parents Mr. and Mrs. Kibwage and my sister Sharon Kibwage for their patience, drive, and love in the pursuit of my academic excellence. I am grateful for the contribution towards my academic progression. I am grateful for their prayers and sacrifice.

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ABBREVIATIONS AND ACRONYMS

ART	Antiretroviral Therapy
CCC	Comprehensive Care Clinics
EHR	Electronic Health Records
EMR	Electronic Medical Records
HCP	Healthcare Professionals
HIS	Health Information System
HIT	Health Information Technology
HIV/ AIDS	Human Immunodeficiency Virus/ Acquired Immunodeficiency Syndrome
HITECH	Health Information Technology for Economic and Clinical Health
HMIS	Health Management Information System
ICT	Information and Communication Technologies
IT	Information Technology
KeHMIS	Kenya Health Management Information System
LAN	Local Area Network
NASCOP	National AIDS and STI's Control Programme
SOPs	Standard Operating Procedures
UTAUT	Unified Theory of Acceptance and Use of Technology
UK	United Kingdom
UPS	Uninterruptible Power Supply
US	United States

ABSTRACT

Electronic medical records are fundamental in ensuring patient medical data is accessible and available to healthcare workers. It comprises computerized medical information systems which help in collecting, storing, and displaying patient information. The study's purpose was to investigate institutional determinants and the implementation of Electronic Medical Records in Government HIV Clinics in Nairobi County, Kenya. This study intended to achieve the following objectives: examine the extent to which leadership skills, human capacity, information communication technology, and stakeholder involvement influence the implementation of Electronic Medical Records in Government HIV Clinics in Nairobi City County. The research made use of a cross-sectional survey research design. This study targeted population of the study was 250 drawn from medical officers, nurses, clinicians, hospital administrators, ICT officers, records clerks, and counselors in Nairobi County, Kenya. A sample size of 152 participants was derived from the target population using Cochran's formula from which proportionate stratified sampling was employed to obtain a sample for each stratum. Data was collected using open and closed-ended surveys and interview guides. Cronbach's alpha coefficient was used to ascertain reliability obtained through the split-half technique. Descriptive statistics in the form of frequencies, percentages, mean, standard deviation, and correlation were employed to analyze quantitative data. It was established that leadership skills with a positive correlation of 0.324; human capacity with a positive correlation of 0.842; information communication technology with a moderate positive correlation of 0.578; and stakeholder involvement with a moderate positive correlation of 0.501 had a significant influence on the implementation of Electronic Medical Records. The study recommended that there is a need for facility leaders to be on the frontline in advocating for system users to have better buy-in from the system users; users need to continuously be offered refresher training to enhance their knowledge in system use; there is a need to always engage and involve the system users in major system decisions to increase their buy-in and to improve accessibility and full usage of systems in the facilities there is need to have all departments provided with the equipment.

CHAPTER ONE
INTRODUCTION

1.1 Background of the Study

It is observed that whilst healthcare contexts vary and several major Electronic Medical Records (EMR) alternatives exist, similar challenges and facilitators have been highlighted across different countries (Gold & McLaughlin, 2016). One of the most important learnings is that the process of implementation of an EMR is as if not more important than the system itself (Campion-Awwad et al, 2014). In this research, the implementation process entails the several stages of implementation including procurement, design, development, adoption, and optimization (Fragidis and Chatzoglou, 2018). Despite the widespread implementation of many successful EMR systems in Denmark, the US, the UK, and Sweden no single country has attained a fully functional EMR system across the community and acute service (Adler-Milstein, et al, 2017).

In the United States (US), EMRs emerged in the 1970's but it was only when the Health Information Technology for Economic and Clinical Health (HITECH) Act was enacted in 2009, that adoption rapidly increased (Moullin et al, 2015). Between 2011 and 2018, the US government paid hospitals and physician offices $38 billion in Electronic Health Records (EHR) implementation incentives, however despite widespread adoption, procurement, and implementation of EHRs at individual healthcare organizations have made it difficult to share data with outside healthcare organizations (O'Donnell et al, 2018). Therefore, a combination of organizational, cultural, human, technical, and data governance issues have underpinned the difficulties in developing a fully interoperable EMR internationally.

In the United States, the Medicine institute stated that utilization of Information Technology (IT) systems in the country's health sector brought considerable progress in patient efficiency, centeredness, safety, timeliness, and equality of healthcare (Institute of Medicine, 2001). Different scholars from various emerging nations including Mongolia South Africa and Mozambique seem to allude to the fact that when looking at population-based decision-making and local health care, there is little value of the health information that is currently accessible. Health workers in these nations report that Health Management Information Systems (HMIS), such as electronic medical records, are only utilized as upward model of reporting, or as tools

to report to administrators rather than as tools to help clinician in making decisions (by nurses and doctors) in disease management and monitoring of patients (Gebre-Mariam et al, 2012).

Nigeria, a nation with more than 150 million people recorded less than 5% percent of health information technology being utilized. (Ammenwerth, Iller & Mahler, 2019). Hindrance to adoption of health information systems, according to Ayodele (2011) in Nigeria include higher cost of implementing a health information system, corruption, inadequate human capital, and infrastructural challenges.

EMR systems are thought to boost the quality of service in healthcare by ensuring higher-quality data is accessible for clinical decision-making as observed in the process of managing the Human Immunodeficiency Virus and Acquired Immunodeficiency Syndrome (HIV/ AIDS) records. Additionally, EMR application in HIV clinics has been observed to boost treatment guidelines, ensuing in advanced HIV/AIDS management which usually requires complex data that is longitudinal. Ouma and Herselman (2018) highlighted that EMRs ensure swift accessibility to medical information which in turn leads to enhanced medical outcomes and more efficient allocation of resources in countries like Kenya. Mulwa (2013) contended that health systems in third-world nations are below standard. Despite many years of doing research around IT, the advancement in application and uptake remains lower.

As is the case in Kenya just like any other Sub-Saharan African country, the expansion of Health Information Technology (HIT) systems among numerous countries in Africa have faced tremendous challenges such as weak infrastructure, inadequate skilled health labor force, the prevalence of poor policies, and inadequate funding (Castel Nuovo, Kiragga, & Afayo, 2012). Electronic Medical Records provide an exceptional chance to enhance ongoing clinical care practices by integrating systems which are deemed suitable to function well in advanced nations. As the prevalence of HIV remains the main public health concern in Kenya, substantial global funding for the management of this pandemic has yield increased investment in EMR uptake in managing complex data meant to monitor the lifetime treatment of persons infected with HIV.

The researcher thinks there's limited research on factors influencing the uptake and use of EMRs by health facilities in the country. To this effect, the current study assesses how capacity building, availability of resources, network infrastructure accessibility as well as staff

educational background impact the uptake of EMR systems by healthcare organizations in Kenya and with reference to the KeHMIS II project. Additionally, despite the benefits derived from these schemes in health facilities, little or none is known about their uptake and application. This research will address the extant research gap by evaluating the adoption and application of EMR in Kenya as observed with reference to the KeHMIS II project.

Institutional factors linked to the procedures that EMR is launched and integrated into routine care by professionals within the healthcare organization. According to Sligo, Gauld, Roberts and Villa (2017), implementation of an EMR system is more than just software delivery and adoption, it requires institutional change, and sociotechnical and contextual domains are a primary challenge. Institutional factors relate to the technique by which the EMR is introduced and integrated into routine care by professionals and/or patients within the healthcare organization. This entails all things that are a prerequisite to and during the implementation phase of the EMR.

Human capacity refers to factors involving the end-user's values and roles and their tendency to accept and support the EMR. Cresswell and Sheikh (2013) study established that the capability of health sector to strategically adopt and implement an EMR system will be massively determined by the prevailing nature and form of human factors within the organizational context. Powell, Proctor, and Glass (2014) asserted that despite the organizational resources and structure, and the technology procured, human-led factors and how the technology interferes with the end-users' beliefs and roles, which define their acceptance level as well as support of the system.

ICT is concerned with technical considerations observed during the adoption of technological advancement. They are technological usability, technological interoperability, and infrastructural development and adaptability aspects. Miller and Sim (2014) argued that most medical practitioners such as physicians in medical institutions consider the application of EMRs challenging because of its implied nature with reference to the multiplicity of screens, navigational materials, and available options. Such technical challenges taking the form of complexity and usability problems compel physicians to make schedules on their time and efforts to put in if they are to master them. Physicians and other professionals at medical institutions must learn the application of EMR systems effectively and efficiently. This may

seem like a heavy burden. It is also likely that insufficient knowledge and skill make physicians regard Electronic Medical Record systems as extremely complicated (Boonstra & Broekhuis 2010).

Progress in medical practices coupled with Information and Communication Technologies (ICT) applications, is bringing about innovative approaches and opportunities meant to support and enable uptake of new services in health sector (Marques, Oliveira, and Martins, 2011). Such tendencies have included the employment of added ICT with the intention of improving standards of health services to be availed to patients, speeding up times in the queue, and solving structural issues in the medical sector (Leonidas et al., 2011). Technical proficiency on the medical side has been blamed for the changes, although technical organizational advancements have not always matched. An Electronic Health Record (EHR) such as the EMR gives authorized users real-time access to patient records as well as creates a longitudinal record of data on an individual's health status in a computer process form that transfers them from one practice or specialist to the next. Implementation of an EHR can bring many benefits to a health service including improved efficiency of health workers enabling them to spend quality time with patients and improved accessibility to patients' information promptly which can reduce duplication of efforts in care provision, and in turn improves patient safety standards and quality of care.

In a developing nation, an effective healthcare system ought to meet the demands of all stakeholders. Most significantly, the systems used must benefit the related Ministry of Health, researchers, physicians, funders, and patients (Weed, 2017). Sub-Saharan countries continue to face challenges such as accidents and disease burden. HIV/AIDS related conditions continue to be a cause of death year in year out for millions of individuals across the world. Mamlin, Biondich, Wolfe, Fraser, Jazayeri, Allen & Tierney (2016) assert that most affected people reside in underdeveloped countries and that an effective response to pandemic may necessitate synchronized, scalable, and swift information systems built with close and reliable effort of all concerned stakeholders.

Lidwick and Doucette (2018) advise further adopters and other stakeholders to exercise caution while putting EMR systems in place due to the paucity of research on the effect of EMR on patients' care, their privacy and reliability. They observe that there is limited investigation on

the stakeholder's role and contribution towards realization of effective EMR systems. Notable studies on the same have not sufficiently compared how provider-patient-facilitator interactions are affected during the initiation and commencement of EMR systems undertakings.

Integration of medical devices is a crucial but frequently disregarded aspect of EMR strategy (Vaz, 2017). Any strategy that goes beyond simply entering a health record into the EMR will not be successful. There must be participation from a variety of stakeholders, including nursing, clinical, and biomedical engineering. Negotiations across conventional hospital repositories and a thorough comprehension of point-of-care processes, medical device interoperability, vendor assistance, and product strategies are necessary for creating a successful long-term plan.

1.2 Statement of the Problem

With the increasing demands on health services coupled with a growing and aging population, Information Communication Technology (ICT) is thought to be a vital tool to ensure sustainable, quality, and safe healthcare service. However, it is now recognized that to derive true value from an EMR, the implementation procedure is significant and may be more vital than the off-the-shelf EHR software. In countries with longstanding EHRs for instance the United States (US), the United Kingdom (UK), and Denmark, a fully interoperable EMR system across the community and acute services has not yet been achieved. The majority of EMR failures have been linked to the process of implementation rather than the supplied product itself (Ammenwerth, Iller & Mahler, 2019).

The success, failure, and limitation in the adoption and implementation of EMR is significantly influenced by varied factors, for instance institutional, human, and technological factors. Sligo et al, (2017), implementation of Health Management Information Systems (HMIS) requires institutional change, sociotechnical, and contextual domains- that pose a primary challenge. Human factors involving the end-users' values and roles and their tendency to accept and support the EMR also causes barrier to implementation of HMIS in clinics. Miller and Sim's (2014) study established that issues such as technological usability, technological interoperability, and infrastructural development and adaptability aspects are bound to inhibit successful implementation of HMIS.

The widespread use of IT in the recent past saw some countries in Sub-Saharan Africa embracing EMR systems. Muriyesu (2016) posits that Rwanda is among the top African countries in the development of ICT and has been pioneering initiatives for integrating technology into its healthcare system through initiatives such as the implementation of Partners in Health (PIH) for HIV patients. Additionally, Akanbi et.al., (2012) suggests that the use of Open-source healthcare software with Open MRS has increased to about 91 percent in sub-Saharan Africa whereby most data is from HIV-related health centers. Both studies were done in a different context, but they agree that EMR systems are beneficial in boosting health-related patients' safety and welfare and processes in the facilities. In addition, Odekunle, Odekunle, and Shankar (2017) suggest the adoption of EMR systems has proved to eliminate up to 92 percent of errors that temper with processes in the healthcare industry. The EMRs' and patient care tend to be simultaneous such that it can easily permit a burden to be put upon end users' access to patient information which creates an individual patient security aspect vital for privacy concerns. The common challenges established in sub-Saharan Africa have been attributed to higher costs of procurement and maintenance, unreliable network coverage/infrastructure, and lack of comfort among facilities with EMR systems. Thus, despite its significance to the health sector, there are still challenges faced in adoption among other countries in sub-Saharan Africa while some facilities still rely on outdated methods which pose a greater limitation to the ever-increasing amount of data to be input, stored, accessed, and managed.

In Kenya, the slow pace in the uptake of electronic health records (EHR) systems such as EMR tends to be a critical issue in the medical field. A survey by USAID Kenya (2019) indicated that the implementation of EMR facilities that contain care and treatment data is estimated to handle over 70 percent of all patients' information and care as well as boost about 95% of general processes. It indicated further that the EMR system is becoming more self-sustaining, with KeHMIS's primary responsibility shifting to overseeing HIS development activities and increasing the capability of stakeholders to adopt and maintain HIS solutions. Hence, the need to expedite the uptake of EMR systems is vital to simplify main processes and functions in the healthcare industry integrate activities across healthcare facilities, reduce general healthcare costs, enhance medical records management, and health program management as well as boost patient care quality. However, the implementation of an effective EMR in the country's HIV

clinics has been marred with a wide range of dynamic deficiencies such as patient follow-up files growing larger with more visits, and information extraction for clinical patient management getting more difficult. When patients switch from one medical center to another, the issue gets worse and the lack of data interchange between the EMR systems (Amoroso & Akimana, 2010). While there exist, many studies conducted on the factors affecting EMR implementation, a sizable number are in developed countries where EMRs have been in use for many years. In Kenya, most researchers have focused on research based on one facility or just a few facilities of interest for their studies. The results obtained may not reflect the wider scope of facilities in the country using different EMRs.

For this matter, the research sought to investigate implementation of EMR in Nairobi County which is influenced by various structural deficiencies such as institutional, human and information communication technology that bring about failure and limitation in adoption and implementation of EMR systems. Failure to achieve full interoperability of EMR system across facilities; EMR failures attributed to the implementation process; inhibition of successful implementation of EMR systems due to technological usability. Technological interoperability and infrastructural development and adaptability; and wide range of dynamic deficiencies such as patients' follow-up files becoming huge when visits become frequent and obtaining record for clinical patients' management become more complex-inhibiting implementation of an effective EMR in the country's HIV clinics.

1.3 Purpose of the Study

This research purposed to investigate implementation of Electronic Medical Records in Government HIV Clinics in Nairobi County, Kenya.

1.4 Objectives of the Study

i. Examine the extent to which leadership skills influence implementation of Electronic Medical Records in Government HIV clinics.
ii. Determine how human capacity influence implementation of Electronic Medical Records in Government HIV Clinics.
iii. Establish the extent to which the information communication technology influence implementation of Electronic Medical Records in Government HIV Clinics.

iv. Assess how stakeholder involvement influence implementation of Electronic Medical Records in Government HIV Clinics.

1.5 Research Questions

i. To what extent do leadership skills influence implementation of Electronic Medical Records in Government HIV Clinics?
ii. How does human capacity influence implementation of Electronic Medical Records in Government HIV Clinics?
iii. To what extent does information communication technology influence implementation of Electronic Medical Records in Government HIV Clinics?
iv. How does stakeholder involvement influence implementation of Electronic Medical Records in Government HIV Clinics?

1.6 Significance of the Study

The researcher hoped that the research findings may enable county government departments heading public health systems, national government health systems, non-governmental organizations that seek to address issues related to management of health and program managers improve on implementation of Electronic Medical Records in Government HIV Clinics. The study hoped to provide valuable information in the form of lessons learnt for future health project planning, designing, and implementation strategies. The findings may also inform policy geared towards implementation of electronic medical records as an instrument to improving how government, organizations and stakeholders can achieve greater output in the management and implementation of EMRs in Nairobi County.

As much as the study was conducted in Nairobi County, it may be relevant to other areas involved in the implementation of EMRs projects. Additionally, the study hopes to rely on its contribution to knowledge body in public health and project management by filling in the gap that currently exists in on aspects training and implementing EMR. Furthermore, the study may be used as reference material by other researchers in information communication technology, health informatics and project management.

1.7 Study Limitation

This study faced several limitations. First, the research was limited in terms of access to information relating to the implementation of EMRs supported by the HMIS II Project in Government HIV Clinics. To mitigate this shortcoming, the study obtained a letter of field work from University of Nairobi and a letter of introduction by the researcher on the need to carry out the research which was exclusively for school purposes. This was backed up by a research permit from NACOSTI. Secondly, due to the prevailing global pandemic exacerbated by the coronavirus, access to the respondents was limited in terms of data collection. The researcher mitigated this by developing online surveys using mobile enables tools such as open data kit and Kobo Collect. These tools are effective for data collection since the survey is designed in a manner that the respondent fills in the details and can convey feedback in real-time. Content and construct validity was also viewed as a limitation in terms of how the instruments were developed and structured. The researcher mitigated this by engaging with the appointed academic supervisor and experts in medical records in addressing the content and how best the instruments were to be constructed. The choice of research assistants was also important. This was mitigated by equipping and training the research assistants for field data collection.

1.8 Delimitation of the Study

The research was undertaken in Nairobi County which is the largest city of Kenya. The population of the County is about 4.5 million inhabitants and therefore the findings may be significant. The study was confined to institutional factors influencing implementation of Electronic Medical Records in Government HIV Clinics. The research is cognizant of the substantial number of variables but was narrowed down to five variables: leadership skills, human capacity, information communication technology, stakeholder involvement and legal framework to significantly influence institutional determinants and adoption of Electronic Medical Records in Government HIV Clinics.

1.9 Basic Assumptions of the Study

It was assumed that participants would avail information accurately with truthfulness, and honesty in responses to the contents of the instruments for data collection. The study also assumes that adoption of Electronic Medical Records in Government HIV Clinics will be of

significant contribution to body of knowledge in public health and project management. Assumptions made further that tools of gathering data were consistent, valid, and measured the chosen constructs. The study assumed further that variable being researched; leadership styles, human capacity, information communication technology and stakeholder involvement influence adoption of EMRs in selected public healthcare facilities in Nairobi County.

1.10 Definition of Significant Terms Used in the Study

Electronic Medical Records (EMR): utilized in healthcare setting and comprises of computer-based medical information systems which gather, store, and share patient information.

Human Capacity: Refer to factors involving the end-users' values and roles and their tendency to the acceptance and support of the EMR. Examples of these factors are individual Skills and characteristics, alleged benefits, and incentives as well as changes in the environments that they work in.

Leadership styles: These are factors linked to how EMR is introduced and integrated into routine care by professionals within the healthcare organization. Examples of these factors Organizational Considerations for EMR implementation, Governance and Management frameworks, End-user Involvement, Leadership and Culture, Organizational Support systems, resourcing, and workflows.

Implementation of Electronic Medical Records: This implies uptake and use of EMR systems to serve different intended purposes in the health sector. It can also be viewed as the as the decision to utilize fully EMR as the best solution.

Legal framework: It is a concept implying all legal considerations and responsibilities enacted by the jurisdiction of a state that should be seen in the health sector. These frameworks are established by the state, and they give way to commissioning of different government projects such as the establishment of the KeHMIS II project.

Information Communication Technology: These refer to factors concerned with technical considerations observed during adoption of a technological advancement. They are

technological usability, technological interoperability, and infrastructural development and adaptability aspects.

Stakeholder involvement: These are individuals and organizations directly involved in the provision of healthcare, commodities, and human resources for health.

1.11 Organization of the Study

This research was divided into five (5) chapters outlined: First chapter focuses on background, problem statement, purpose, objectives, research questions, research hypothesis, significance, limitations, delimitations, basic assumptions, definition of significant terms; and finally, organization of the study. The second chapter contains the literature reviewed which encompassed the review in relation to the themes developed from objectives, theoretical review, conceptual framework, knowledge gap and a summary of reviewed literature. The third chapter covered the methodology used which addressed the research design, targeted population, sample size and sampling procedure, research tools, procedure of gathering data; techniques of data analysis; and ethical considerations. The fourth chapter addressed data analysis, presentation, interpretations, and discussions of the finding while chapter five focused on summary of findings, conclusions, recommendations, and areas for further research.

CHAPTER TWO
LITREATURE REVIEW

2.1Introduction

This chapter presents relevant literature on institutional factors that influence implementation of EMRs. The chapter examines institutional factors, human factors, accessibility to technology, resource availability, capacity building, and their influence on the implementation of Electronic Medical Records. This chapter provides theoretical and empirical reviews of the relationships that exist to highlight knowledge gaps from past studies. The chapter concludes with a conceptual framework and a summary of reviewed literature.

2.2 Implementation of Electronic Medical Records

The concept of EMR is a crucial innovation in the healthcare industry recently. Research shows readiness for the implementation of electronic medical records (EMR) has enhanced healthcare workers' performance. This is evident in in-patient enhanced treatment, generation of patient medical reports, and patient follow-up.

In the USA, Lorenzi et al, (2009) posit that performance of electronic medical records is based on indicators in terms of readiness, level of technology, leadership styles and change management. The findings emphasized the role of management in readiness to implement electronic medical records. According to Khan et al., (2018) the uptake of EMRs across the US keeps dragging slowly. The situation is also noted in European countries, like the Netherlands that reported over 90 percent utilization of EMRs by main care physicians. In Canada, the technology has been commercially available for over three decades, but the rates of adoption have been consistently below 30 percent, with some estimations being as low as 7.6% for a basic EMR system, underscoring the uncertainty of institutions confront in their decision to acquire the innovation.

In India, successful implementation of EMRs has ability to enhance patient care through proper management of patients' medical and individual data with ease (Singh & Muthuswamy, 2018). The benefits of successful implementation EMRs may be summed up to cover minimization of errors made by people, making easier accessibility to medical information, improving the security of medical data, reducing double efforts on documentation while maximizing health

data documentation, improving the quality of care, reducing information telecommunication costs, boost decision making process, creating data repository as well as reducing paper works (Singh & Muthuswamy, 2018).

Electronic medical records have improved efficiency in maintaining patient information as compared to paper-based patient records (Dhar, 2018). Healthcare workers and caregivers who use EMR reduce medical errors and spend minimal time looking up information through paper files. In boosting readiness to implement electronic medical records, development of health facility plans and evaluation of resources within facilities in hospitals is a vital step in establishing both the success and failure of setting up EMRs.

A standard electronic medical record should at least address the following key areas as proposed by Baldwin (2019); patients' hospital history, clinical charting, lab, and x-ray orders results; reports on the patient referrals history, the applicable fees, and the interdependency of the hospital systems among other features. Ghazisaeidi et al, (2014) assert that readiness to adopt electronic medical records portrays a concise and direct view of the recent state of the health facility. This covers the investigation and assessment of various aspects in hospitals to identify potential issues and address them before implementation.

In Ethiopia, Biruk et al, (2014), researched on health worker enthusiasm to implement an EMR system, found that the rate of EMR utilization was brought by failure to engage the routine workers in formulating hospital policy. This was attributed to the low acceptance and failure to assess the staff attitudes towards the implementation of EMRs. In contrast to the findings, in South Africa, Yogeswaran and Wright (2010), contended that successful technology readiness based on ICT infrastructure and resources in healthcare facilities achieved remarkable improvement on the implementation of EMRs. Training of health and administrative staff enabled the improvement in the treatment and follow-up of their patients. These findings clearly indicate that implementation of EMR without proper staff involvement and engagement in training and skills development will be futile.

An empirical study conducted by Health Information Technology for Economic and Clinical Health (HITECH) (2017) discovered that failure in implementing EMRs was because of a lack of ICT and assessment of other available resources in the health facilities. The study also showed that utilization of modern technology by the members of the healthcare workforce was

difficult and as a result, they spent more time on service delivery. The study's findings clearly indicate there was an issue in the attitude of healthcare workers towards the change of technology which led to non-acceptance of electronic medical records among the facility workforces. These findings are in line with those of Acquah-Swanzy (2015) in evaluating the ERM system in Ghana. The study concluded that readiness permits any health center to detect any barriers that may occur while implementing the EMR system.

2.3 Leadership Skills and Implementation of EMRs

The viability of the healthcare sector depends on the frontline leaders' capacity to strengthen their leadership skills. The adoption of an integrated leadership development approach poses a significant barrier for health facilities, notwithstanding the ease of identifying core competences and creating leadership curricula (Block and Manning, 2007). An organizational culture that views the modeling of future leaders as a strategy to succeed in the long-term is necessary. Except for senior medical leadership positions, doctors receive little ad hoc training in managerial and leadership, for instance service improvement approaches (Clark and Armit, 2008).

To address future health needs, healthcare systems need strong leadership for sustainability (Pan-Canadian Health Leadership, 2007). Advanced economies, for example, Canada, Britain, the USA, and New Zealand have emphasized on the urgency of having strong leadership. The MLCF (2008) highlights the leadership skills doctors need to effectively participate in the development, provision, and reform of healthcare services. All medical professionals, including doctors in training, fit this classification. The framework has five key areas each having four competencies: individual qualities, cooperating with others, managing services, enhanced services, setting directions to service delivery. The framework's application differs in respect of doctors' cadre and their role. The framework is utilized distinctively depending on the doctor's professional level and the sort of function they play.

Challenges for communication, purpose alignment, and system-level planning and monitoring challenges are brought by the growing size and complexity nature of the health care delivery system. This transition takes place rapidly and the rate of change is unlikely to slow down (Lerman and Jameson, 2018). The medical field profession has been lethargic in the face of external change and has failed to prioritize on nurturing leadership skills including

collaboration, communication, deliberative decision making and team building that bolsters the subsequent generation of healthcare professional leaders to thrive in the fast-paced dynamic environment.

In the USA, healthcare accounts for 18 percent of the economy. There are 6000 hospitals and more than a million physicians. From this population of healthcare practitioners, some of them play distinct roles for instance leaders of departments, quality officers, heads of clinical departments, information technology team leads, heads of budgetary allocation committee, and other positions in the health facilities. In any high-performing institutions, leaders have a disproportionate impact on organizational performance and culture (Lerman and Jameson, 2018).

An empirical study conducted by Ajami and Bagheri-Tadi (2013) found that leaders may already be in these roles before implementing electronic medical records. However, any pre-existing underlying issues between the leaders and end-users should be highlighted and alleviated before EMR process implementation. The study also highlighted the need for sensitizing these leaders on EMR implementation. The study concluded that participation and collaboration during the initial stages of implementation is key between leaders and healthcare technicians in implementation of electronic medical records.

An emerging form of leadership worldview is transformational leadership. It entails the transformation of the organization's status quo to clearly show it is in line with the institution's vision, goals, and mission. Bass and Riggio (2006) assert that achieving this leadership style, may require several considerations for instance organizational values, change in the standard operating procedures in terms of output, long-term goals, ethics among leaders, and follower attitude. Northouse (2013) posits that transformational leaders demonstrate a considerable influence on subordinates and motivate perform beyond normal expectations, thus bringing change to both the subordinate and the institution into a better state. Transformational leadership engages people with others and builds a connection that boosts morale of leader and followers.

Top, Akdere, and Tarcan (2015) conducted quantitative study basing on transformational leadership, trust, commitment as well as job satisfaction in Turkish hospitals with a focus on public workers versus private sector workers. They discovered that transformational types of

leadership, organizational trust, employee satisfaction, and commitment were based on workers' attitude. According to the study, operating practices, communication as well as trust were substantial predictors of overall commitment for public workers, whereas for private sector workers, tailor-made support, acceptability, contingent rewards, and trust in organization were significant regresses of overall organizational commitment.

In the United Kingdom, Ireri et al, (2011) conducting mixed methods research on medical leadership and management on experiences gained, competency, and developmental needs of doctors who are managers found out that doctor managers exhibit a diverse leadership skill, but rate professional integrity as being the most vital quality to achieve success. The study concluded that the doctor managers' crucial need was for training needs and development in both financial and human resource managements.

The empirical studies clearly indicate the importance of leadership skills in the medical field and especially implementation of electronic medical records. The present study seeks to uncover the level to which leadership styles impact implementation of Electronic Medical Records in Nairobi County. The study will also test the relationship between leadership skills and implementation of EMRs in Nairobi County, Kenya.

2.4 Human Capacity and Implementation of Electronic Medical Records

A project management team entails a critical factor influencing effective implementation of computer-based type of information systems. The number of members within project management implementation team should depend on the size and type of facility (Nguyen et al, 2014). The team may consist of three or more members from multiple disciplines for instance; information technology (IT), administration, clinical) and departments, and should include representatives from front-line staff with a single person assigned in making final decisions. The members may include: EMR team lead; EMR implementation manager; information technology lead; workflow redesign lead; clinical and administrative leads who could be the end-user's representative and a super-user lead.

In England, a case study conducted by Scott et al, (2005) at an English hospital observed that successful implementation occurred where tasks were shared amongst the team members rather than having a project manager as the EMR manager. The project management team should be responsible for project planning, developing realistic timelines and tracking milestones,

business plan and cost estimations, delineation of roles and responsibilities and Communication of strategy with staff (Stevenson, Lau, and Murray, 2016).

In Ireland, the eHealth report (2019) indicated that training end-users is a key factor in the process of implementing EMR. The report further indicates that inefficiency or lack of training in the implementation of EMRs is deemed a barrier to successful implementation. Kouroubali and Katehakis (2019) assert that providing excellent quality training to end-users improves their proficiency, accuracy, time management, satisfaction, engagement, and acceptance. Furthermore, training reduces overall disruptions to end-user workflows. The results are congruent with that of Ross et al, (2016) who claim that poor or insufficient training hampers progress, results in failure to meet the full potential of an EMR, and fosters insecurities and concerns amongst end-users. Additionally, inability to utilize EMR requires greater training time for end-users, whereas a flexible and intuitive system facilitates ease of learning thus reducing the burden of training.

The ease at which health sector adopts an EMR system successfully is massively relied on end-users of the system (Cresswell and Sheikh, 2013). Despite the organizational resources and structure, and the technology procured, human factors and how the technology interferes with end-user's values and roles, determines their level of support and acceptance for the system. Powell, Proctor & Glass, (2014) assert that the lack of basic computing skills has been noted to be a substantial barrier to the implementation of EMR amongst end-users. Prior computer experience should be considered an aspect of the technology acceptance model.

According to (Gatotoh, Keiyoro & Gakuu, 2017), many end-users of EMR systems usually receive professional qualifications before IT programs are introduced at workstations, and the consequent lack of IT experience and support are thought to be an even more widespread issue in the smaller, more rural organizations. Evidence points out that younger individuals find it easier to become accustomed to using an EMR. Powell's research is inconclusive, due to the many other confounding factors including the usability of the system, quality of training and support provided, and individual characteristics.

Knowledge of ICT is needed to promote favorable attitudes toward EMR that lead to increased uptake (Ochieng & Hosoi, 2005). The Nigeria case study by Senamu and Ochiotu (2014) revealed there was little to no knowledge at all the usage of computer technology for record

keeping. To raise alert on the use of ICT in this medical field, much work still must be done. Only a small portion of the EMR system's functionality has been adopted by hospitals.

Additionally, to increase EMR adoption there is need for customization ability which is the system's capacity to adapt to user needs. Doctors become reluctant to embrace the static EMR systems that fail to support their customized workflow fully. own preferences and methods. For instance, physicians prefer to write letters on their own, format and modify them to suit the intended need (Randeree, 2017).

A study conducted by Ford et al, (2010) on hospital IT uptake strategies linked to implementation success on the implications for achieving maximum use indicated that healthcare organizations ought to make investment on their present workforce to develop the needed skills relating to information technology, training, support, change management and an understanding of clinical workflows. The study concluded that reconfiguration of the workforce in healthcare organizations can reduce dependence on vendors for support and maintenance. Similar findings by Fragidis and Chatzoglou (2018) are in line with those of Ford et al, (2010) who indicate that human resources are important during implementation of electronic medical records. The current study seeks to test whether there is a substantial link between human capacity and implementation of EMR in Nairobi County.

2.5 Information Communication Technology and Implementation of Electronic Medical Records

Globally, healthcare delivery has been revolutionized and improved by the advancement, uptake, and utilization of ICT. ICT adoption and use in healthcare facility for administration and management of patients, hospital employees, purchasing of goods and services and other functions has improved efficiency as compared to the previous application of manual functions for instance paper-based way of keeping records which proved inefficient in data management (Khwima et al, 2017).

The application of paper recording by health workers in health facilities is still in use since most health-workers are extra-familiar and comfortable with paper-based records (Fitzpatrick, 2000). This form of record-keeping requires low technical expertise since paper-based record keeping systems may be utilized by individuals with lower levels of education or little to no

training. On the other side, this form of system has several limitations; illegibility of a person's handwriting may be a challenge when read by others resulting in errors, omissions and subsequently compromise the entire quality of data captured (Fitzpatrick, 2000). Poor data quality is believed to have serious effects on patient care, including mix-up of laboratory samples and dispense of inappropriate prescriptions. There is also a lack of confidentiality with paper-based record systems since they could be easily shared among very many users compromising privacy of patient (Job et al, 2013).

Most physicians in medical institutions view EMRs as a complex technique to use because of an array of screens, options available as well as navigational aids (Miller and Sim, 2014). The complex nature and usability problem linked with EMRs forces physicians to commit extra efforts and time whenever they try to gain their knowledge. The doctors and other professionals at the medical institutions must gain knowledge on how to efficiently and effectively utilize the EMR system which in turn is time-consuming. Boonstra and Broekhuis (2010), posit that there might be a possibility of rendering the system complicated due to lack of skills by the healthcare practitioners in the health facilities.

In Africa, for instance Malawi, health facilities had for a long time been managed by paper-record systems up to the year 2001 when computerized systems of managing patients were introduced (Douglas et al, 2010). Since then, the EMR systems have enhanced the service delivery of the health sector (Chetley, 2013).

For the effective use of EMR, broadband form of internet connectivity with higher-speed data transfer capacity is required (Ouma and Herselman, 2018). One barrier to implementation of EMR in developing nations is the lower internet access charge and lower bandwidth charge (Muchangi & Nzuki, 2014). For instance, one significant issue in Africa is a lack of internet capacity. According to the researcher, Kenya has several issues with internet access, and the few internet service providers that are available on the market deliver very subpar services due to capacity restrictions. The bulk of the country's areas may not support internet disposition due to weaker ICT-related infrastructure and low internet coverage, which hinders the adoption of EMR.

A study conducted by Mugo and Nzuki, (2014) and cited by Gatotoh et al, (2018), states that the limited uptake of e-Health in underdeveloped nations is attributed to physicians' lack of

computer literacy. Like this, Qureshi et al. (2013) argue that in Pakistan, doctors' slow adoption of the internet was caused by a lack of appropriate technology and inadequate training. The expense of putting an EMR system into place is one of the difficulties. Each system's functionality may be unique, which can lead to time consumption, sluggish processing, and unfriendly user interfaces. Other providers' capacity to communicate successfully can be hampered by a lack of or inadequate compatibility with EMR systems. The data in EMRs must be accurate and trustworthy. The standard of care tends to be lowered otherwise.

Hardware and software for electronic medical records cannot be used right out of the box. They must be connected to other technology that enhances and completes the EMR system (Boonstra & Broekhuis 2010). Such interconnection issues are a well-known barrier to widespread adoption of EMRs among doctors in medical practices that have adopted them. In essence, EMRs are incompatible with practice systems already in use, and doctors are hesitant to do away with useful structures to create a unified system that includes EMRs. A qualitative multi-case analysis conducted by Randeree (2017) on exploring physician adoption of EMRs found out that physician’s unwillingness to embrace and implement EMRs negatively affect workflows and consumes more time in the application of other forms of records and do not meet the physicians' personal styles. The study concluded that the reluctance of other physicians to participate was seen as a setback to implementation of EMRs.

Despite these findings, there are still challenges that impact implementation of EMR systems, such as low computer literacy, security concerns, and insufficient funds to support the purchase of EMR infrastructure (Walter & Lopez, 2018). EMR adoption is hampered by the fact that many physicians in poor nations lack the technical know how to work with them.

2.6 Stakeholder Involvement and Implementation of Electronic Medical Records

Stakeholders can be organizations, groups, or individuals, who directly or indirectly influence the operations and outcomes of an intervention. They contribute and affect the output of the organization (Bryson, 2015). While one side of the coin is identified with how an organization carries on when managing its stakeholders, the opposite side is identified with how a stakeholder considers the organization responsible to himself/herself.

The healthcare industry has seen growth in the support and active part played by patients in health and research as compared to former years where the patient was more of a subject or

participant (Esmail et al, 2015). This has yielded to the recognition that patients' contributions and perspectives are a vital component in effective and efficient health research (Liberati, 2011). In advanced economies for instance the USA and Canada, the involvement of stakeholders has seen the creation and development of institutes of health research established to cater for patients. In North America, the Canadian health research institute produced a strategy for patient-oriented research which comprises of a several partners devoted to giving support to scholars in transitioning patients into entire phase of research to better train on knowledge required for improved patient outcomes. These stakeholders include patients who are parents, caregivers, public members and family, health professionals, researchers, and policy makers, among others.

Stakeholder contribution entails the early and progressive procedure of building and keeping up connections in view of recognition and common trust through discourse with assorted groups of onlookers about complex issues (Jones, 2015). Stakeholder inclusion cultivates vital advancement of organizations, brings about community oriented critical thinking and synergy. According to Freeman and McVea (2012), the help of all stakeholders is fundamental to an organization's prosperity and sustenance of projects. To ensure this kind of setting is effective, institutions need a practical plan to meet all stakeholders' requirements and mobilize support for collective project initiation.

Participation of employees as indicated by Aliyu, (2019) is done by involving employees in to take lead in producing shared decision making in the work situation. It is a form of delegation where the subordinate can gain greater control and freedom to bridge the communication gap between management and subordinates (Noah, 2008). When employees are not involved or do not participate in organizational decision making, the organizations usually result in low performance which can lead to friction between the top leadership and subordinates.

In Low Income Countries (LIC), decentralization has gained prominence as it tends to bolster stakeholder participation (O'Meara et al., 2011). Decentralization entails the shift of power from a once centralized form of administration to a devolved form where formal power has shifted to other institutional structures. It comprises of various forms, for instance devolution, de-concentration, delegation, and privatization (Jeppsson and Okuonzi, 2000). Countries for instance Uganda, Kenya, Indonesia, India, and Kenya having implemented decentralized

framework which have mandated public engagement in the health sector at sub-national levels (Shayo et al., 2013; Bolsewicz Alderman et al., 2013).

In Uganda, the principal contributors to decentralization and priority setting were politicians, donors, and technical experts but the public is diversely excluded. Decentralization was intended to bolster stakeholder involvement in state decision-making; nevertheless, it is giving politicians more authority and legitimacy as the public's representatives rather than the public at large. A qualitative analysis study conducted by Razavi et al, (2019) on stakeholder involvement in priority setting for health within three districts in Uganda observed that the key contributors to stakeholder involvement at the district-level were politicians, technical specialists, and donors. The study also found out that in terms of budgetary allocation, politicians were heavily involved whereas expertise was covered by donors, technical specialists, and CSOs /NGO, whereas financial and technical resources were leveraged for donors and CSOs /NGO. The study concluded that vulnerable groups, for instance the youth and persons with disabilities were left out in priority setting process for health in the district.

In the USA, a study conducted at the Patient-Centered Outcomes Research Institute initiative by Forsythe et al. (2016) found that the most common and prevailing challenges experienced by stakeholders include patients lack time at 46% which ranked the highest, lack of knowledge in research represented by 30% and the need to find patients and other stakeholders to engage in research by researchers at 27% respectively. The study also found out that most researchers had difficulty in managing time for engagement, lack of resources at 274% and knowledge and experience in stakeholder engagement and participation at 22% respectively. The study concluded that there ought to be active engagement between patients and researchers. Early engagement can aid in the creation of new and innovative ideas, approaches and questions which might result in more relevant research outcomes.

Furthermore, in a study by Domecq et al, (2014) on patient engagement in health research found out that several barriers for instance patients' discontinuation from health research, patients' level of frustration with training duration and orientation, transportation due to frequency of training meetings, and limited funding to boost patient engagement, were some of the key contributors to achieving stakeholder engagement. The possibility for patients'

participation in research to become tokenistic and undervalued was the common worry between patients and academics that struck me as being the most painful.

The empirical studies reviewed clearly show the significance of stakeholder involvement in healthcare. However, the studies have generalized participation and involvement in healthcare. This study seeks to assess how stakeholder involvement influence implementation of EMRs and test the association between stakeholder involvement and implementation of EMRs in Nairobi County, Kenya.

2.7 Legal Framework and Adoption of Electronic Medical Records

In recent times different administrations across the world have been consistently working on developing legal frameworks addressing healthcare modernization with the objective of quality enhancement and containment of cost in the health sector. ANAES (2017) report on role of legal frameworks in adoption of effective Health Records Management Systems in France, highlighted some frameworks as discussed herein. There are specific frameworks addressing Patient rights on reliance of an effective EMR. Such laws clarify a patient's main contribution in medical information management, as they are the primal beneficiary of the EMR systems. The researcher thinks confidentiality aspect and patient's rights are expected to pressure EMR to achieve better in matters concerning data security, content, and access. Accreditation policy guidelines have also been highlighted. Government regulated hospitals are accredited institutions paying attention to development of effective and reliable HIS and EMR systems in diverse ways regarding performance, security of data or improvement of quality.

Dossier Medical Personnel framework enacted by the Spanish monarch was highlighted by Kaplan (2018). The enactment launched initiated the process of developing the basis for a unique EHR for every Spanish citizen. In terms of patient routes, a patient-centered healthcare system, and financial savings, this tool's prospective uses are highly significant. The current analysis, however, demonstrates that this project's conditions, method, and even philosophy are all severely challenged. However, the researcher wants to make clear that the predicted demand on hospitals' electronic medical records (EMR) can be significant in connectivity, security, and patient information caliber.

Challenge in financing public health system and the ability to develop quality and patient-oriented health system make it hard for governments to develop important legislative and

administrative strategies meant to foster effective implementation of EMR systems (Bingi, Sharma & Godla, 2018). For instance, governments face challenges such as improving the competence level of managers in the information system field. The state must play a significant role in the establishment of an open health information system by reducing organizational and technological risks and exerting pressure on hospitals to upgrade their electronic medical records, and this responsibility is hardly undertaken appropriately. Most of the Medical Institutions' budgets strain to meet development needs. As generally observed cross board, professional deontology should consider cultural aspects on information sharing and quality, but this idea has been severely weakened, but this consideration has been undermined.

According to the NASCOP/HMIS (2018) EMR report, Kenya's ministry of health department-Health Information Management Systems (HMIS) assessment in 2018 brought to light the lack of rules and regulations that enable the use of HIS and that define standards and implement Standard Operating Procedures (SOPs) for data security. The report also noted that there existed no proof that the present system was set up to comply with national policies and guidelines concerning medical information. NASCOP's review established that, as observed in most cases, there were no standards in place for data verification in system design, no EMRs complied with international bodies (for instance SNOMED, AHFS, ICD- 9CM as well as messaging standards (HL7). The report also highlighted issues associated with standard procedures, and confidentiality of data and security as primal challenges to observance of legal frameworks and policies governing implementation of EMR systems in HIV clinics. Standard Operating Procedures for EMR design and development, deployment, security, usage, backup strategy and data exchange were quoted to be lacking all EMRs except IQCare and Open MRS.

Mandl et al, (2017), notes that since information technology makes it possible to gather and store data on a scale that is not achievable by non-electronic methods, it is widely believed that the introduction of IT into a system fundamentally alters the nature of individual privacy. People ought to always find a way to circumvent security measures, regardless of how advanced they become. If nothing else, they might be able to undermine someone with authorized access to the data by taking advantage of human frailty. Concern about privacy and security has been noted as an obstacle that prevents adoption of health technologies like EMRs. Contrary to systems used before the widespread adoption of IT, such as manual filing systems,

personal information captured in information systems may be infinitely duplicated, transmitted instantly, and used in previously unimaginable ways, posing new privacy and security issues.

According to Barrow and Clayton (2016), patient privacy should be properly preserved and protected in electronic medical records (EMRs) at least to the same extent as in non-IT-enabled systems, such as in paper works. Since electronic medical records include sensitive data, privacy is the most concerning concern. Records may be found to indicate a history of drug misuse, venereal disease, or a serious illness. The development of information technologies has impacted how public and private entities store and make records under their control available. Computers enable businesses to build enormous, intricate databases and make vast volumes of data electronically accessible. Personal financial and medical record databases, for example, may be beneficial to individuals themselves. Without adequate security measures, outsiders might be able to access the information, endangering the owners' right to privacy. In an electronic setting, it is possible to violate people's inherent right inadvertently or willfully to privacy. For instance, identity theft is becoming a significant issue in electronics.

2.8 Theoretical Framework

The research was hinged on three theories; Diffusion theory which covers objective 1 of the study, Unified Theory of Acceptance and Use of Technology (UTAUT) theory which covers objective 2 and 3 of the study and, the Stakeholder theory which covers objective 4 of the study.

2.8.1 The Diffusion of Innovation Theory

This theory was initiated by Rogers in 1962. The theory originated in the field of communication and explains how, over time, an idea gains momentum and or spreads through a determined social system or population. The outcome of this diffusion is that individuals, being part of a societal system, embrace a new idea, behavior, or product. Rogers (1962) opines that diffusion of innovation theory has several main sources that influence adoption which constitutes an aspect of innovation, attributes of the adopter and circumstantial factors. The proponent argues that innovation occurs in four stages that is invention, diffusion that is tied to communication via the social system, time, and consequences. This theory applies in the current study in that it is related to the study's objective on leadership and the influence on adoption of Electronic Medical Records. Leaders have a strong influence on the people who

are working under them. They must be focused on continually engaging the facility providers on system usage and its advantages to care provision.

2.8.2 Unified Theory of Acceptance and Use of Technology

The UTAUT was anchored on technology Acceptance Model (TAM) propounded by Davies et al, (2000) and was advanced by Venkatesh, Thong, and Xu in 2012. According to the theory, behavioral intention and behavior are directly determined by four major constructs: performance expectancy, effort expectancy, social influence, and facilitating factors. These constructions are in turn modified by age, gender, attained experience, and voluntariness of usage (Venkatesh et al., 2003). Many prior studies of technology or innovation adoption and diffusion across a variety of fields, like marketing, information systems, psychology as well as management, have successfully and universally used the notion. The approach relates to this research in that it supports the utilization of ICT and the need to have the necessary capacity that is deemed to influence adoption of EMRs.

2.8.3 Stakeholder Theory

It was proposed by Freeman (1984). According to the thesis, active stakeholder involvement in development projects is crucial and beneficial to the recipient community. According to the notion, a key managerial responsibility is to influence the network of interactions that affect an organization's or institution's success. Participation of stakeholders is important in identifying the limitations and goals of a community. According to Harvey and Reed (2007), the involvement of users is crucial since it increases their entitlement. The theory has relevance since much focus is given to adoption of Electronic Medical Records which requires concerted involvement of various parties in the adoption process. According to Epstein (2017), coordinated efforts or collaboration between users and the implementing bodies ought to be enforced to ensure participation of locals.

2.9 Conceptual Framework

Independent variable: Institutional Determinants **Dependent Variable:**

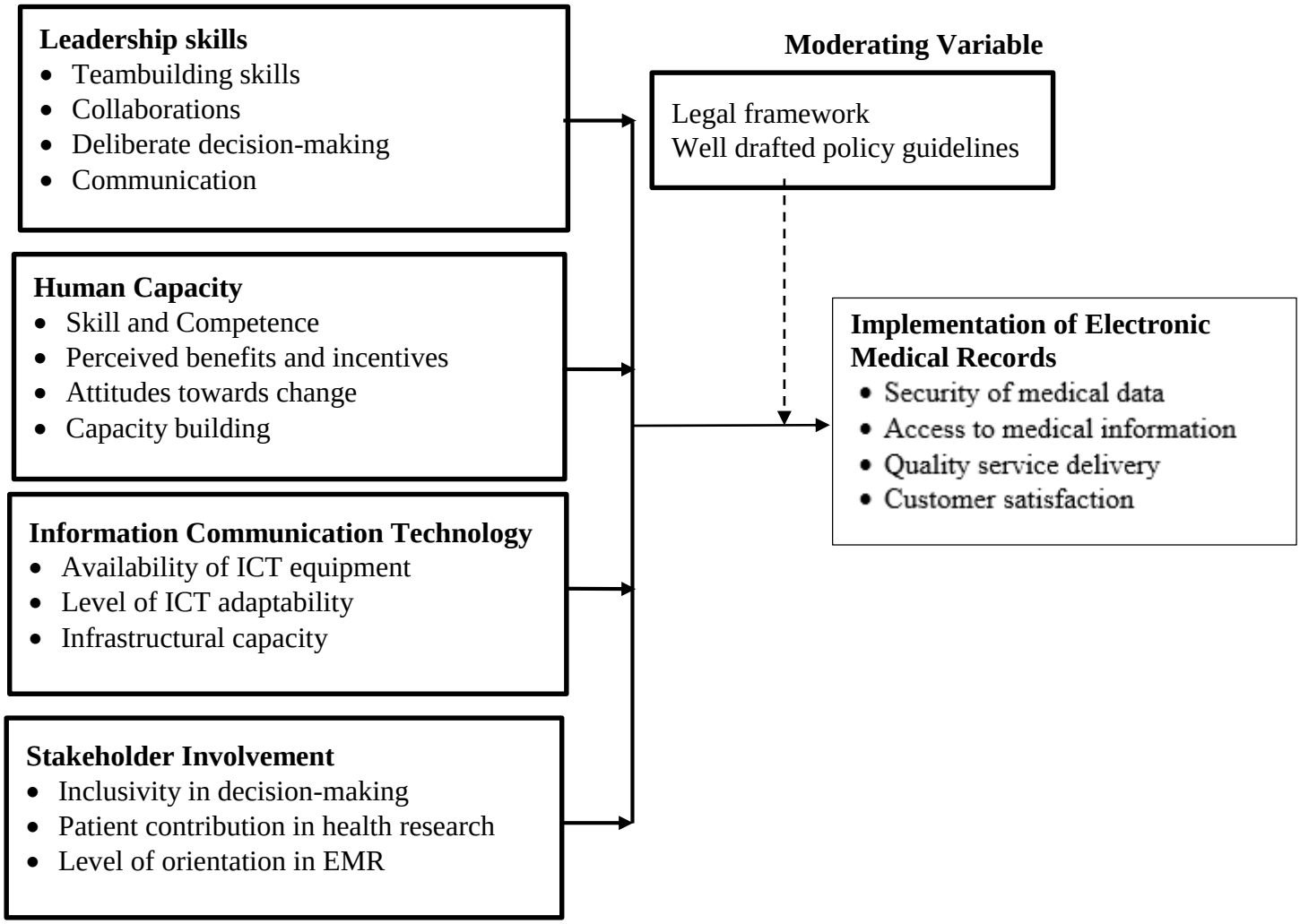

Figure 2.1: Conceptual Framework

The researcher has identified variables including the independent variable, dependent variable, and the moderating variable to explain the factors influencing implementation of Electronic Medical Records (EMR) as observed under the Kenya Health Management Information System II (KeHMIS II) project. The Independent variable is Institutional Determinants; the Dependent variable is implementation of Electronic Medical Records (EMR); and the Moderating variable is legal framework.

2.10 Knowledge Gap

Table 2.1: Knowledge Gap matrix

Variable	Author/year	Title	Methodology	Findings	Knowledge gaps
Leadership Skills	Top, Akdere, and Tarcan (2015)	Examining transformational leadership, job satisfaction, organizational commitment, and organizational trust in Turkish hospitals		Standard operating procedures, communication and organizational trust were significant predictors of overall organizational commitment for public servants, whereas individualized support, fostering the acceptance, promotion, contingent rewards, and organizational trust were the significant regressors' of overall organizational commitment of private sector employees	The study failed to address the key leadership skills which enable organizational trust, individual support, and commitment from healthcare workers.
	Ireri et al, (2011)	Leadership and management on experiences, competencies, and development needs of doctor managers		Doctor managers have many management and leadership skills but rate professional credibility as the most important quality to succeeding.	The study did not address the need to train and develop doctors in financial and human resource management which are key leadership skills.
Human Capacity	Ford et al, (2010)	Hospital IT adoption strategies associated with implementation success on the implications for		Healthcare organizations should invest in their existing workforce to develop the needed skills relating to information technology, training, support, change	There is scarce awareness of the use of computers for record management. However, role of ICT skills required to foster positive attitudes about EMRs is an area that seems to be under looked.

		achieving meaningful use	management and an understanding of clinical workflows.	
	Gatotoh, Keiyoro & Gakuu, (2017)	Learner Characteristics: Antecedents for mLearning Adoption among Community Health Trainees, Kenya	End-users of EMR systems usually receive professional qualifications before IT programs are introduced at workstations, and consequent lack of IT experience and support is thought to be an even more widespread issue in smaller, more rural organizations.	The focus of the study was more on community health trainees and not healthcare frontline workers
Information Communication Technology	Ouma & Herselman (2018)	E-health in rural areas: Case of developing countries.	Effective application of EMR requires network connectivity with high-speed capability for data retrieval and transfer.	Network accessibility and adoption of EMR systems in public health institutions is also not researched, especially in developing countries. Despite the common findings of previous studies that EMR systems can be complex for health practitioners, these studies have focused on EMR systems with less emphasis on network accessibility.
Stakeholder involvement	Razavi et al, (2019)	Stakeholder participation in priority setting for health in three districts in Uganda	Key contributors to stakeholder involvement were politicians, technical experts, and donors. Budgetary allocation, technical expertise and financial resources are significant to ensure the functioning of healthcare services at district level.	The study failed to include triangulation of the instrument as it only used one approach, qualitative.

	Forsythe, L.P, Ellis, L.E, Edmundson L, et al. (2016).	Patient and stakeholder engagement in the PCORI pilot projects: description and lessons learned	Most researchers had difficulty in managing time for engagement, need for resources and knowledge and experience in stakeholder engagement and participation.	The need to train stakeholders' especially frontline workers, is key to realizing implementation of any technology.
Implementation of Electronic Medica Records	Kazley & Ozcan (2017)	Organizational and Environmental Determinants of Hospital EMR Adoption: A National Study. Journal of Medical Systems	The study findings on organizational and environmental determinants of EMR implementation noted that the implementation of EMR Technology is a practice often considered as part of a larger data management systems designed to store, manage, and query various medical data.	Studies on the implementation and impact of EMRs especially in the HIV/AIDS context are few, mostly retrospective, without controls, with most data from informants' self-reports and often from surveys which makes the experience less generalizable.
	Biruk et al, (2014)	Health worker readiness to implement an EMR system.	The rate of EMR utilization was because of the failure to engage the operational staff in the hospital readiness plan.	Low acceptance and failure to assess the attitudes of healthcare staff towards implementation of electronic medical records.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1Introduction

The chapter discusses methodology employed. It covers the targeted population, research design, sample size and sampling technique, research tools, procedures for gathering data, techniques of data analysis, research ethics and operationalization of the variables.

3.2Research Design

This study made use of descriptive survey research and correlational survey research design that involves gathering and making comparisons of data from the phenomena being studied. Correlation design involved testing the relationship between the predictor and response variable in the study. A descriptive study is an appropriate design that allows numerous variables to be studied at the same time with ease (Crowther and Lancaster, 2018). The study utilized both qualitative and quantitative research designs that allowed for triangulation of data. In addition to being a way to find corroboration, triangulation helps deepen our understanding of objects being studied. The capacity to reduce any potential bias and increase the dependability of the information gathered led to the selection of this design.

3.3 Target Population

Kothari, (2004) posits that target population encompasses the entire gathering of events, people or elements to which researchers are intended to sum up the conclusions. The population targeted were 250 healthcare workers distributed in 46 government health facilities across 17 Sub-counties in Nairobi County operating KHMIS II EMRs in the Comprehensive Care Clinics (CCC) across Nairobi County. The strata included 250 personnel designated as administrators, clinicians, nurses, data clerks, and ICT personnel serving their respective roles in the hospitals.

Table 3. 1: Target Population

Category	Target Population	Percentage (%)
Medical officers	21	8.4
Nurses	64	25.6
Clinicians	38	15.2
Hospital Administrators	22	8.8
ICT officers	30	12.0
Records Clerks	30	12.0
Counsellors	45	18.0
Total	**250**	**100.0**

3.4Sample Size and Sampling Procedures

The researcher adopted different sampling procedures as discussed below.

3.4.1Sample Size

The sample size of the study was 152 obtained from target population using Cochran formula (1977). A sample entails a portion of population targeted which is selected procedurally to represent it (Oso & Onen, 2005). Table 3.2 presents the sample size determination.

$$no = \frac{(1.96)(1.96)(0.5)(0.5)}{(0.05)(0.05)}$$

=384.16

$$n = \frac{384}{1 + \frac{384 - 1}{250}}$$

=151.65

Table 3. 2: Sample Size Determination

Category	Target population	Proportion	Sample size
Medical officers	21	0.084	13
Nurses	64	0.256	39
Clinicians	38	0.152	23
Hospital Administrators	22	0.088	13
ICT officers	30	0.12	18
Records Clerks	30	0.12	18
Counsellors	45	0.18	27
Total	**250**	**1.0000**	**152**

3.4.2 Sampling Procedures

This study made use of multistage sampling and proportionate stratified sampling to ensure that individuals in each zone are represented in the sampling process. Multistage sampling involves taking samples in phases using smaller sampling units at each stage (Whittaker, 2012). With multistage sampling, the researcher selected a sample by using combinations of different methods like random and purposive sampling. Multistage sampling highlighted different EMR facilities per level of designation. This technique was employed because the population identified for study is bigger and dispersed to practically make a list of the entire population from which to choose a sample study group. Under each identified facility, the researcher will employ stratified sampling to cluster the study sample into strata made up of administrators, clinicians/ nurses, data clerks and ICT personnel serving their respective roles in the hospitals. These officers serve in different designations such as Administrative staff, Clinical Officers, Health Information ICT, Nurses, and Health records officers.

In each professional area, random sampling followed by purposive sampling was employed to select members of the diverse groups (Administrative staff, Clinical Officers, Health Information ICT, Nurses and specialist nurses and Health records officers) That collectively made up the total sample size.

3.5 Research Instruments

The research utilized both primary data and secondary data. Primary data was obtained using questionnaires and interview guides whereas secondary data was gathered through desk research analysis. Self-administered questionnaires were employed to obtain primary data from 152 of the public health facilities in Nairobi County. The structure of the questionnaire covered both open-ended questions and closed-ended questions. Open-ended questions together with the interview guide attempted to gather qualitative data. Collection of quantitative data was designed in a 5-point Likert scale format where closed-ended statements were structured in measuring the study variables as proposed by Brown and Brown (2011). The survey was clustered into five sections whereby the first one was on demographic characteristics of participants such as their gender, age, educational level as well as number of years of service in health institution. Section two, three, four, five and six followed a Likert scale format with statements relating to variables and research indicators.

Semi-structured interview guides were employed in gathering information from key informants. Bernard (2006) asserts that this approach involves utilization of interview guide to give the interview's general direction, though the interviewer retains option to track leads. The technique allowed the interviewer to explicate responses from the health professions in the public health institutions in Nairobi County and to ask interviewee for information that might not have been recorded in the survey questionnaires.

The study involved document analysis which involved perusal and analysis of secondary data specifically targeting previous research on adoption of e-health within public health facilities. The secondary data involved analysis of reports, plans, surveys, and any other documents relevant to the study. Bowen (2009) posits that document analysis entails qualitative research whereby the researcher interprets materials to bring up context and meaning to a topic under review.

3.5.1Pilot Testing of the Instruments

The research chose to pretest 10 percent of 152 which was the sample size and obtained 15 research tools for the pilot testing. Simon (2011) asserts that 10 percent of sample size was satisfactory and sufficient for a pilot study to represent the main study. The activity of pretesting was given to the frontline health workers in the public health facilities in Kiambu County which bears similar characteristics as the study setting (Mugenda & Mugenda, 2003). The goal of doing pilot testing was to improve face validity and establish the validity and reliability of the tools. A pilot study is a test run conducted while preparing for the primary study with the main goal of pre-testing the tool and identifying any potential issues the tool may have (Joppe, 2009).

3.5.2 Validity of Research Instruments

This entails the ability of a research tool to gauge what it was envisioned to measure (Kothari, 2004). The validity of instruments for this research was ensured through assessing the resultant effect of the instruments in previous research. The researcher availed the research instruments to a team of experts on health management systems to assess whether the research tool solved the research problem. The team of experts was drawn from the health sector.

3.5.3Reliability of Research Instruments

This entails the level to which the instruments produce stable, uniform, and consistent results when a repeat of measurements and observation while maintaining same conditions (Kothari, 2004). Test-retest reliability, internal consistency, and inter-rater reliability are three examples of factors evaluated using reliability estimates. A widely acceptable rule is that alpha(α) of 0.6 to 0.7 infer an acceptable reliability level, while 0.8 or greater infer an incredibly satisfactory level.

Table 3. 3: Reliability Coefficient

Variable	Number of items	Cronbach Reliability Coefficient(α)	Interpretation
Leadership Skills	8	0.804	Reliable
Human Capacity	8	0.719	Reliable
Information Communication Technology	8	0.888	Reliable
Stakeholder Involvement	8	0.887	Reliable
Implementation of HMIS	8	0.863	Reliable
Average Coefficient		**0.832**	

Cronbach's alpha method was applied to obtain the coefficient of internal consistency to estimate how reliable the measurements were by obtaining a function of average interrelations between objects and number of objects in scale. The approach is applicable to studies that employ Likert-summarized scales, including the Mini-Mental State Examination, activities-of-daily-living measures, and quality-of-life tools.

3.6Data Collection Procedures

For implementing this study's objectives, the researcher collected data, conducted the pilot study, reliability, and validity of tools, and then analyzed the data to establish logical conclusions and the way forward. After successfully defending the proposal, the research clearance will be obtained from the institution and a permit from the NACOSTI. Subsequently, the researcher obtained endorsement from hospitals to partake in research in their organizations and consent from respondents too.

In the time of data collection process, the researcher developed an introduction letter to the respondents. Similarly, a letter of authorization was required before conducting research issued

by University of Nairobi and then acquired permit from NACOSTI. These documents facilitated visits to the locality area and introduced officially the study concepts to the hospital administrators. The research assistants were employed and involved through training in how to distribute research tools. Self-administered questionnaires were issued to participants who were given about two weeks to fill in the instruments. The research assistants engaged the participants through interview guides to acquire qualitative data.

3.7Data Analysis Techniques

Analysis was undertaken through collection, sorting, cleaning, and editing. The data was analyzed using the SPSS version 28 to obtain descriptive and inferential statistics. Parametric analysis was considered since the measurement scale indicated was at interval scale. The descriptive statistics comprised of the frequency distribution, percentages, mean and standard deviation (std. dev). Inferential statistics consisted of Pearson Product Moment Correlation. Correlation was used to measure the strength and direction of the relationship between the predictor and response variables. Qualitative analysis used content analysis technique used to analyze information from concluded interviews. Main themes were marked from responses recorded while notes and codes were assigned to main themes.

3.8 Ethical Considerations of the study

These are guidelines or rules that safeguard the rights of all participants. They are measures made to make sure that no one's rights, or safety are ever compromised. Therefore, these factors are typically considered to make sure that research involving human, or animal subjects is undertaken in adherence to high moral standards. These requirements include voluntary involvement, informed consent of participants, information security, participant anonymity, and authorization from the appropriate authorities (Resnik, 2005).

A consent letter was issued to paricipants to assure them that the research was being conducted exclusively for purposes of wring academic report. The researcher also attached the letter to the questionnaire to share with the respondents the exercise's voluntary nature and to handle their information confidentially. The researcher did not ask for personal identification of participants to motivate them and assure them of the anonymous nature of the information provided.

3.9 Operational definition of variables

Measurement of variables was done and tabulated in table 3.5.

Table 3. 4: Operationalization Table of variables

Objectives	Variable	Indicator	Research Instrument	Measurement Scale	Type of analysis	Tools of Analysis
i. To examine the extent to which leadership skills influence implementation of Electronic Medical Records in Nairobi County.	Leadership skills	• Teambuilding skills • Collaborations • Deliberate decision-making • Communication	Questionnaire Interview Guide	Interval	Descriptive Statistics Inferential statistics	Mean, SD, Correlation
ii. To determine how human capacity influence implementation of Electronic Medical Records in Nairobi County.	Human Capacity	• Skill and Competence • Perceived benefits and incentives • Attitudes towards change • Capacity building	Questionnaire Interview Guide	Interval	Descriptive Statistics Inferential statistics	Mean, SD, Correlation
iii. To establish the extent to which information communication technology influence implementation of EMRs in Nairobi County.	Information communication technology	• Availability of ICT equipment • Level of ICT adaptability • Infrastructural capacity	Questionnaire Interview Guide	Interval	Descriptive Statistics Inferential statistics	Mean, SD, Correlation
iv. To assess how stakeholder involvement influence implementation of EMRs in Nairobi County.	Stakeholder involvement	• Inclusivity in decision-making • Patient contribution to health research • Level of orientation in EMR	Questionnaire Interview Guide	Interval	Descriptive Statistics Inferential statistics	Mean, SD, Correlation
Implementation of EMRs in Nairobi County.		• Security of medical data • Access to medical information. • Quality service delivery • Customer satisfaction	Questionnaire Interview Guide	Interval	Descriptive Statistics Inferential statistics	Mean, SD, Correlation

CHAPTER FOUR

DATA ANALYSIS, PRESENTATION, INTERPRETATION, AND DISCUSSION

4.1 Introduction

This chapter details the study results and discussions analyzed according to the study objectives. The thematic areas comprised of return rate of questionnaire, demographic characteristics of respondents, implementation of EMRs; leadership skills and implementation of EMRs; human capacity and implementation of EMRs; information communication technology and implementation of EMRs and finally stakeholder involvement and implementation of EMRs.

4.2 Questionnaire Return Rate

Of the 152 respondents issued with questionnaires, 136 were duly filled, correctly addressed, and returned as shown in Table 4.1.

Table 4.1: Questionnaire Return Rate

Return Rate	Frequency	Percentage
Returned	136	89.5
Not returned	16	10.5
Total	**152**	**100.0**

The return rate attained was 89.5% which was deemed sufficient as backed by Cooper and Schindler (2000) who applaud that for research to take place, a response rate of 75 percent and above of the study was suitable for data analysis to proceed.

4.3 Demographic Characteristics of the Respondents

In probing the demographic feature of respondents participating the researcher considered the distribution of participant's gender, age, level of education, position in the health facility, number of years they worked in the facility. The demographic characteristics would be significant in the analysis and interpretation of findings.

Table 4.2: Demographic Characteristics

Return Rate	**Frequency**	**Percentage**
Returned	136	89.5
Not returned	16	10.5
Total	**152**	**100.0**
Gender	**Frequency**	**Percentage**
Male	89	46.4
Female	103	53.6
Total	**136**	**100.0**
Age	**Frequency**	**Percentage**
Below 20 yrs.	5	3.7
20- 25 yrs.	18	13.2
26- 30 yrs.	57	41.9
31- 35 yrs.	38	27.9
36- 40 yrs.	13	9.6
41+ yrs.	5	3.7
Total	**136**	**100.00**
Education	**Frequency**	**Percentage**
Certificate	39	28.7
Diploma	58	42.7
Bachelor's degree	27	19.9
Master's degree	12	8.8
Total	**136**	**100.0**
Position	**Frequency**	**Percentage**
Administrator	15	11.0
IT Officer	8	5.9
Data Clerk	13	9.6
Clinician	20	14.7
Nurse	50	36.8
Counsellor	30	22.1
Total	**136**	**100.0**
Number of Years	**Frequency**	**Percentage**
Less than 3 yrs.	34	25.0
3 – 5 yrs.	40	29.4
5 yrs. and above	62	45.6
Total	**136**	**100.0**

The findings indicate that 53.6% of participants were females while 46.4% were male. This infers that majority of the healthcare providers in the facilities are females an indication that gender could contribute to implementation of EMR in Nairobi County.

Respondents with the age bracket below 20 years were 3.7%, between 20 – 25 years were 13.2%, between 26 – 30years were 41.9%, between 31 - 35 years were 27.9%, between 36 - 40 years were 9.6% and finally those above 41 years were 3.7%. The findings indicate that most participants were aged between 26 and 40 years. This is an indication that most of the health care providers are neither too young nor too old. This may be a factor in the ability to use health systems in the facilities.

Out of 136 respondents, 28.7% indicated they had attained certificate level of education, 42.6% had achieved diploma level, 19.9% had completed bachelor's degree, and 8.8% were either pursuing or completed their master's degree level. This implies that all the participants had a formal education and thus the ability to comprehend system usage.

Out of 136 respondents, 11.0% worked as administrators in the health facilities, 5.9% were IT officers, 9.6% indicated as data clerks, 14.7% clinicians, and 36.8% were nurses while 22.1% were counsellors. The findings imply that most of the health care professionals were either clinicians, nurses or counsellors with the lowest cadre represented being the IT Officers. The small number of IT Officers may have a direct impact on system usage.

The findings obtained from the study observed that majority of participants had more than 5 years in management of health facilities as represented by 45.6%, with respondents less than 3 years recording 25.0% of the responses while those between 3 – 5 years represented 29.4% of the responses in the health facilities. This infer that majority of those who took part 70.0% of the sample had been working in the facilities for a substantial amount of time and thus may have better understanding and technical expertise in implementation of health management systems and issues related to health systems.

4.4 Health Facility Profile

This section of the chapter sought to provide information regarding the profile of the health facilities basing on number of EMR systems in the facility, the interoperability of the systems, and mode of use of the system, departments linked with the systems and services offered through the EMR in the HIV clinics.

4.4.1 Distribution of EMR systems by Health Facility

Data on the distribution of EMR systems by health facility as tabulated in Table 4.3.

Table 4.3: Distribution of EMR Systems

Number of EMR	Frequency	Percentage
1	20	43.5
2	18	39.1
3	8	17.4
Total	**46**	**100.0**

Out of the 46 facilities, 43.5% registered having only one EMR facility while 39.1% indicated that they had 2 EMR systems while 17.4% indicated they had more than 3 EMR systems in the health facilities which were not interoperable. This infers that majority of the health facilities in the County of Nairobi had one and two EMR systems representing 82.6% of the health facilities.

4.4.2 Distribution of EMR Systems by Interoperability

Data on the distribution of EMR systems by interoperability is presented in Table 4.4.

Table 4.4: Distribution of EMR systems by Interoperability

Systems Interoperability	Frequency	Percentage
Yes	13	28.3
No	33	71.7
Total	**46**	**100.0**

The findings obtained from the study observed that only 28.3% of the facilities had EMR systems that were interoperable with other health facility systems while 71.7% were not interoperable implying that communication between the systems and departments faces difficulties. With lack of interoperability, there is a great loss in leveraging cross system collaboration and thus duplication of efforts and inadequate service delivery.

4.4.3 Distribution by mode of use of the system currently in use in the HIV clinic

To determine the distribution by mode of use of the system currently in place, the following information was gathered from the research presented in Table 4.5.

Table 4.5: Mode of System Use in Health Facility

Mode of Use	Frequency	Percentage
Point of Care (POC)	13	28.3
Retrospective Data Entry (RDE)	18	39.1
Hybrid (RDE+POC)	15	32.6
Total	**46**	**100.0**

The findings obtained from the study observed that mode of use by point of care (POC) recorded 28.3% of the responses, retrospective data entry (RDE) represented 39.1% whereas the hybrid system mode recorded 32.6% of the participants. From the findings most of the facilities still rely on paper records by entering data retrospectively. EMR systems are designed with various features, for instance decision support and reports to enhance service delivery. To enjoy the benefits, it is necessary for providers to use the systems at point of care. The findings clearly show that many health care providers still do not reap the benefits of systems due to the retrospective mode of use and this might explain the preference for paper records.

4.4.4 Distribution of Access to EMR for HIV Care by departments

To determine the distribution of access to EMR for HIV care by departments, the following information was gathered from the research presented in Table 4.6.

Table 4.6: Access to EMR for HIV Care

Department Access	Frequency	Percentage
Yes	18	39.1
No	28	60.9
Total	**46**	**100.0**

The findings obtained from the study observed that only 39.1% of facilities had all departments offering HIV care have access to EMR while 60.9% of the facilities did not have coverage in some departments offering HIV care services. The lack of systems coverage in some departments is notable a huge determinant of adoption by healthcare providers.

4.4.5 Distribution of Services offered through EMR

To determine the distribution of respondents by services offered through EMR, the following Table 4.7 presents the data obtained from the research.

Table 4.7: Services offered through EMR

EMR Services	Number of EMR	Percentage (%)
HTS	46	100
HIV Care and treatment	46	100
ANC	15	32.6
PNC	15	32.6
Maternity	10	21.7
TB	25	54.3

The data shows that 100% of facilities utilize the EMR to document both HIV testing and treatment data. The utilization of the systems to capture ANC, PNC and Maternity data is minimal with only 32.6% and, 21.7% and 54.3% for TB respectively using the system to capture the data. From the results it is apparent that most of the facilities only utilize the EMRs for capturing testing and treatment data. The coverage of EMR usage across the facility departments is key for seamless care provision. Lack of usage in some departments may impede the uptake and usage due to some data still being captured on paper while some is in the system.

4.5 Implementation of Electronic Medical Records

The data collected on dependent variable; implementation of HMIS II project in Nairobi County, Kenya was descriptively analyzed in quantitative form. The participants were to give their responses as per the statements provided. Responses were measured employing the Five-point Likert scale where 1= Strongly Disagree (SD), 2= Disagree (D), 3= Neutral (N), 4= Agree (A) and 5= Strongly Agree (SA).

Table 4.8: Implementation of Electronic Medical Records

Statements		5	4	3	2	1		
	n	F (%)	F (%)	F (%)	F (%)	F (%)	Mean	Std. Dev.
1. Electronic medical reports support evidence-based decision-making	136	48 (35.3)	54 (39.7)	10 (7.4)	9 (6.6)	15 (11.0)	3.65	1.004
2. Implementation of HMIS enhances performance among healthcare workers	136	62 (45.6)	52 (38.2)	11 (8.1)	6 (4.4)	5 (3.7)	3.84	0.998
3. Implementation of HMIS influences enhanced treatment, generation of reports and patient follow-up	136	73 (53.7)	50 (36.8)	0 (0.0)	7 (5.1)	6 (4.4)	4.21	0.733
4. EMR implementation improves the security of medical data	136	54 (39.7)	57 (41.9)	14 (10.3)	5 (3.7)	6 (4.4)	3.86	0.981
5. Local health facilities are prepared for implementation of HMIS	136	49 (36.0)	43 (31.6)	12 (8.8)	16 (11.8)	16 (11.8)	3.44	1.264
6. Healthcare workers struggle to use the modern technology on HMIS	136	43 (31.6)	40 (29.4)	2 (1.5)	24 (17.6)	27 (19.9)	3.15	1.457
7. Adequate technological preparation enhances healthcare workers in the process of change and utilization	136	66 (48.5)	53 (38.9)	4 (2.9)	7 (5.1)	6 (4.4)	4.03	0.750
8. Development of plans and assessment of resources determine the success and failure of implementing HMIS	136	68 (50.0)	45 (33.1)	13 (9.6)	5 (3.7)	5 (3.7)	4.08	0.784
Composite mean and SDV							**3.78**	**0.996**

Table 4.8 presents the statements on the dependent variable. The means of 8 on the response variable were used to generate data were summed up and utilized in computing the composite mean and standard deviation (std.dev) that resulted to 3.78 and 0.996, respectively.

Statement one, electronic medical reports support evidence-based decision-making. The results are indicated as follows; 35.3% indicated strongly agree, 39.7% indicated agree, 7.4% indicated neutral, 7.4% implied disagree and 11.0% infer strongly disagree while having a mean of 3.65 and std.dev of 1.004. The composite mean (3.78) that is greater than the statement line-item mean indicates that the statement had differing responses on EMR supporting evidence-based decision making.

The study obtained responses on whether implementation of HMIS enhances performance among healthcare workers, the results indicate that 45.6% strongly agree, 38.2% agreed, 8.1% were neutral and 4.4% indicated disagree and 3.7% infer strongly disagree while having a mean of 3.84 and a std.dev of 0.998. When comparison was made to composite mean 3.78, infers those respondents had convergent opinions as recorded by 83.8% of the participants.

The third statement purposed to discover whether implementation of HMIS influences enhanced treatment, generation of reports and patient follow-up. The study gathered the following results; 53.7% indicated strongly agree, 36.8% indicated agree, and 5.1% indicated disagree and 4.4% inferred strongly disagree while having a mean of 4.21 and std.dev of 0.733. This infers that the statement had many participants with convergent views about the line item.

The results for the fourth statement indicated that EMR implementation improves the security of medical data. The descriptive findings tabulated in Table 4.11 indicate that 39.7% strongly agree, 41.9% indicated agree, 10.3% neutral, 3.7% indicated 4.4% inferred strongly disagree. The statement recorded a mean and std.dev of 3.86 and 0.981, respectively. This infers that 81.6% of the respondents agreed had similar sentiments concerning the statement.

Statement number 5, local health facilities are prepared for implementation of HMIS. The results indicate that 36.0% indicated strongly agree, 31.6% infer agree, 8.8% were neutral, 11.8% and 11.8% strongly disagree having a mean of 3.44 and a std.dev of 1.264. The composite mean was greater than line item (M=3.78>M=3.44) denoting that there were several divergent opinions from the respondents.

Statement number six, healthcare workers struggle to use the modern technology on HMIS. The results obtained were as follows; 31.6% strongly agree, 29.4% indicated agree, 1.5% were neutral, 17.6% disagree and 19.9% strongly disagree. This statement had a mean of 3.15 and std. dev of 1.457. This infers that the responses to the statement had differing views as supported by 61.0% of the respondents.

On whether adequate technological preparation enhances healthcare workers on the process of change and utilization, findings indicate that out of 136 responses, 48.5% SA, 38.9% infer agree, 2.9% indicated neutral, 5.1% disagreed and 4.4% strongly disagree with a mean of 4.03 and std. dev of 0.750. This infers that the statement drew convergent opinions from the

respondents. This is evident since the statement mean was greater than composite mean (M=4.03>M=3.78).

The last statement, development of plans and assessment of resources determine the success and failure of implementing HMIS. Findings obtained were 50.0% SA, 33.1% were those who agree, 9.6% were neutral, 3.7% disagree and 3.6% indicated strongly disagree. The statement gained a mean of 4.08 and a std. deviation of 0.784. It infers that the responses about the statement had convergent opinions indicated by 83.1% of participants.

4.6 Leadership Skills and Implementation of Electronic Medical Records

Objective One purposed to establish the extent to which leadership influences implementation of Electronic Medical Records in Government HIV Clinics in Nairobi City County. Leadership skills were determined by the following indicators: teambuilding skills, collaborations, deliberate decision-making, and communication. Responses were measured employing the Five-point Likert scale where 1= Strongly Disagree (SD), 2= Disagree (D), 3= Neutral (N), 4= Agree (A) and 5= Strongly Agree (SA).

Table 4.9: Leadership Skills and Implementation of Electronic Medical Records

Statements		**5**	**4**	**3**	**2**	**1**		
	n	**F (%)**	**F (%)**	**F (%)**	**F (%)**	**F (%)**	**Mean**	**Std. Dev.**
1. Health-care systems require stronger leadership to be sustainable and also responsive to future health needs.	136	73 (53.6)	57 (41.7)	0 (0.0)	4 (2.9)	2 (1.5)	4.42	0.808
2. Leadership style influences organization culture in implementation of HMIS.	136	81 (59.6)	42 (30.9)	5 (3.7)	3 (2.2)	5 (3.7)	4.56	0.661
3. Leaders support emerging physicians in understanding implementation of HMIS.	136	50 (36.8)	32 (23.5)	13 (9.6)	17 (12.5)	24 (17.6)	3.50	1.024
4. Training in leadership skills such as	136	64 (47.1)	47 (34.6)	8 (5.9)	10 (7.4)	7 (5.1)	3.88	0.946

	financial, business planning and personnel management.							
5.	Collaboration and partnership between healthcare workers is vital in the implementation of HMIS.	136	66 (48.5)	68 (50.0)	0 (0.0)	2 (1.5)	0 (0.0)	4.44	0.680
6.	Transformational leadership encourages innovation.	136	77 (56.6)	40 (29.4)	8 (5.9)	5 (3.7)	6 (4.4)	3.92	0.836
7.	Healthcare workers possess a wide variety of management and leadership skills	136	56 (41.2)	43 (31.6)	10 (7.4)	15 (11.0)	12 (8.8)	3.68	1.001
8.	Professional credibility remains the most important quality to succeeding	136	88 (64.7)	41 (30.1)	0 (0.0)	7 (5.1)	0 (0.0)	4.70	0.516
Composite mean and SDV								**4.14**	**0.809**

Table 4.9 presents the statements on the dependent variable. The means of 8 on the response variable were used to generate data were summed up and utilized in computing the composite mean and standard deviation (std.dev) that resulted to 4.14 and 0.809, respectively.

The descriptive statistics were utilized in obtaining information on whether health-care facilities need stronger leadership to be responsive and sustainable to cater for future health needs. Out of 136 participants who took part in the study, 53.6% strongly agreed, 41.7% agreed, none agreed nor disagreed, 2.9% disagreed and 1.5% strongly disagree, respectively. The responses realized a mean of 4.42 and std. deviation of 0.808 greater than the composite mean (4.14) and SD = (0.809). Thus, strong leadership is required for health facilities to have better health systems for sustainability as supported by 95.3% of the respondents.

Leadership style influences organization culture in implementation of HMIS, the study unveiled the following results: 59.6% SA with the statement, 30.9% indicated agree, 3.7%

indicated neutral and 2.2% disagreed while 3.7% were strongly disagree realizing a mean of 4.56 and std. deviation of 0.661. It infers that majority of participants agreed that leadership styles influence organizational culture as supported by 90.5% of the respondents.

Leaders support emerging physicians in understanding implementation of HMIS, the findings were as follows; 36.8% infers strongly agree, 23.5% infer agree, 9.6% drew neutral responses, 12.5% infers disagree and 17.6% infers strongly disagree having a mean and std. dev of 3.50 and 1.024, respectively. Results indicate that the statement had several divergent views about the statement. More than half, 60.3% of the respondents felt that they were well supported by the facility leaders.

The fourth statement under the study variable; training in leadership skills such as financial, business planning and personnel management, the results indicate that 47.1% strongly agreed that training is important in management, 34.6% indicated agree, 5.9% indicated neutral, 7.4% infers disagree while 5.1% infers strongly disagree having a mean of 3.88 and std. dev of 0.946. The composite mean was greater than the line-item mean indicating that there were conflicting views concerning the statement.

Under the fifth response on whether collaboration and partnership between healthcare workers is vital in implementation of HMIS, the responses were as follows; 48.5% indicated strongly agree, 50.0% indicated agree and 1.5% disagreed. The mean line item was 4.44 that was greater than composite mean (4.14) and std. dev of 0.680, respectively. The outcome suggested that collaborations and partnerships are vital in HMIS as supported by 96.4% of the responses.

Opinion on whether transformational leadership encourages innovativeness was positively suggested by 56.6% respondents who agreed while 5.9% were neutral and did not take either side while 5.9% were neutral, while 3.7% disagreed and 4.4% strongly disagreeing while having a mean of 3.92 and std. dev of 0.836. The statement mean was lesser than the composite mean (M=4.14) and std. deviation 0.809 indicating that there were significantly more divergent views from the responses.

The seventh statement of the first predicator variable purposed to investigate whether healthcare workers have a wider variety of leadership and managerial skills. The findngs are presented as follows; 41.2% infers strongly agree, 31.6% infers agree, 7.4% infers neutral,

11.0% infers disagree while 8.8% infers SD. The statement recorded a mean of 3.68 and std. deviation of 1.001. When comparing to the composite mean 4.14, the findings infers that majority of participants had divergent views about health workers possessing variety of skills in leadership and management.

On whether professional credibility is the most important quality to succeeding. The findngs are deduced as follows; 64.7% infers strongly agree, 30.1% infers agree, none of the respondents were neutral and 5.1% infers disagree. The statement reported a mean of 4.70 and std. dev of 0.516. When comparing to the composite mean 4.14, the findings infers that majority of participants had convergent views concerning the importance of professional credibility as supported by 94.8% of the respondents.

4.6.1 Correlational Analysis on the Relationship between Leadership Skills and Implementation of Electronic Medical Records

The researcher aimed to establish the link between leadership skills and implementation of Electronic Medical Records by using Pearson Correlation. The technique helps in investigating the association between leadership skills and implementation of Electronic Medical Records in Government HIV Clinics. The correlations are as shown in Table 4.10.

Table 4.10: Correlation Analysis between Leadership Skills and Implementation of Electronic Medical Records

Variable		Leadership Skills	Implementation of Electronic Medical Records
Leadership Skills	Pearson Correlation	1	0.324**
	Sig. (2-Tailed)		0.000
	n	136	136
Implementation of Electronic Medical Records	Pearson Correlation	0.324**	1
	Sig. (2-Tailed)	0.000	
	n	136	136

**. Correlation is significant at the 0.05 level (2-tailed)

Table 4.10 captures the results to determine the relationship between leadership skills and implementation of Electronic Medical Records. There existed a weak and positive association of 0.324 between leadership skills and implementation of Electronic Medical Records indicating a substantial link having a p-value of 0.000. The value was less than the test statistic

of 0.05. This indicated that leadership skills influence the implementation of EMRs. This study's findings verify those of Ajami and Bagheri-Tadi (2013) who found that leaders need to be sensitized on the nature of EMR implementation process. The study concluded that participation and collaboration during the initial stages of implementation is key between leaders and healthcare technicians in implementation of electronic medical records.

4.6.2 Qualitative Analysis of Leadership Skills and Implementation Electronic Medical Records

The research obtained data on qualitative information regarding leadership skills and implementation of Electronic Medical Records in Nairobi County, Kenya. Information on whether leadership skills were contributed to health management information systems implementation was sought from the participants. From the analysis of the data collected, there existed a weak and positive correlation of 0.324 between leadership skills and implementation of Electronic Medical Records indicating a substantial link with p-value of 0.000. This can further be qualified by some of the key informant's opinion on leadership skills as recorded the following.

> *Leadership in the healthcare system is important keeping in mind that they are dealing with people's lives. The primary concern for all health institutions is to provide quality care to their clients. This is only possible with adequate data and information captured in the various forms of Health Information Systems. From experience, the facilities that thrive best in system use usually have a lot of backing from the facility in charge.*

When asked about the influence of leadership skills in electronic medical records, a medical officer mentioned.

> *Initially when the HIV program started in Kenya, the drive was for basic data collection to aid in reporting. As the campaign to achieve the 90 90 90 UNAIDS goal has intensified over the years, there has been a push from the ministry and county to ensure adequate data is captured. EMRs have not only made it easier and faster to capture and retrieve data but also, they have aided in providing efficient patient care. As it currently the ministry of health through NASCOP have intensified the campaign towards ensuring all HIV patients data is captured in the EMRs at the facilities. Without the ministry's support and leadership, it would be difficult to have as many EMR implementations as we have now.*

Findings from the quantitative and qualitative data information infer that there was a weak and positive link between leadership skills and implementation of Electronic Medical Records among. This justified the benefit of using a mixed method research approach in Nairobi County, Kenya.

4.7 Human Capacity and Implementation of Electronic Medical Records

The second objective purpose is to find out how human capacity influence implementation of Electronic Medical Records in Government HIV Clinics in Nairobi City County. Human capacity was measured by the following indicators to develop statements in the Likert scale, skill and competence, perceived benefits and incentives, attitudes towards change and capacity building.

Five-point Likert scale where 1= Strongly Disagree (SD), 2= Disagree (D), 3= Neutral (N), 4= Agree (A) and 5= Strongly Agree (SA).

Table 4.11: Human Capacity and Implementation of Electronic Medical Records

Statements	n	5 F (%)	4 F (%)	3 F (%)	2 F (%)	1 F (%)	Mean	Std. Dev.
1. Healthcare top management influence positive attitude towards implementation of electronic medical records.	136	100 (73.5)	31 (22.8)	5 (3.7)	0 (0.0)	0 (0.0)	4.79	0.467
2. Frontline health workers are involved in the process of decision-making of the health facilities.	136	103 (75.7)	30 (22.1)	3 (2.2)	0 (0.0)	0 (0.0)	4.85	0.457
3. Health professionals would prefer manual operations to the use of computers.	136	93 (68.4)	37 (27.2)	3 (2.2)	2 (1.5)	0 (0.0)	4.64	0.572
4. Retrieval and access of patient records takes few seconds as compared to accessing paper records which takes a longer time	136	80 (58.8)	44 (32.4)	12 (8.8)	0 (0.0)	0 (0.0)	4.50	0.655
5. Health facility staff are engaged in training and refresher courses on electronic medical records management.	136	88 (64.7)	33 (24.3)	5 (3.7)	5 (3.7)	5 (3.7)	4.23	0.684
6. Public health facilities have sufficient trained human capacity trained in practices	136	91 (66.9)	44 (32.4)	1 (0.7)	0 (0.0)	0 (0.0)	4.77	0.657
7. EMR implementation improves workload management in public health facilities.	136	86 (63.2)	40 (29.4)	8 (5.9)	2 (1.5)	0 (0.0)	4.50	0.655
8. Retrieval and access of patient records takes few seconds as compared to accessing paper records which takes a longer time	136	77 (56.6)	50 (37.8)	2 (1.5)	3 (2.2)	4 (2.9)	4.22	0.694
Composite mean and SDV							**4.36**	**0.605**

Table 4.11 presents the statements on the dependent variable. The means of 8 on the response variable were used to generate data were summed up and utilized in computing the composite mean and standard deviation (std.dev) that resulted to 4.36 and 0.605, respectively.

The first statement of the third variable on whether healthcare top management influence positive attitude towards implementation of electronic medical records obtained the following descriptive findings; 73.5% agreed, 22.8% indicated agree whereas only 2.6% were neutral while the statement recording a mean of 4.79 and std. dev of 0.467. Research findings infers

that majority of participants agreed that healthcare top management influence positive attitude towards implementation of electronic medical records as supported by 97.4% of the respondents.

Frontline health workers are involved in the decision-making of the healthcare facilities. As indicated on Table 4.17, the composite mean of the variable was 4.36 which was lower than the line-item statement at 4.85. The descriptive findings obtained were that 75.7% strongly agreed, 22.1% indicated agree while 2.2% neither agreed nor disagreed drawing a mean of 4.85 and std. deviation of 0.457. It infers that the statement had substantial participants with convergent views as compared with the composite mean of 4.36, which was recorded by 97.8% of participants who agreed.

Health professionals would prefer manual operations to the use of computers drew the following results; out of 136 responses, 68.4% strongly agreed, 27.2% indicated agree, 2.2% indicated neutral while 1.5% indicated disagree with a mean and std. dev of 4.64 and 0.572. Findings suggest that most of responses and views were positive and supporting that health professionals prefer manual operations as compared to the use of computers in their daily operations as supported by 95.6% of responses.

The fourth statement purposed to establish whether retrieval and access of patient records takes few seconds as compared to accessing paper records which takes a longer time. Findings in Table 4.11 suggest that 58.8% infers strongly agree, 32.4% infers agree and 8.8% indicated neutral with no respondent indicating disagree about the statement having a mean of 4.50 and a std. dev of 0.655. While comparing to the composite mean (4.36), denotes that the line item had convergent views resulting from the participants. This is supported by 91.2% of the respondents.

Respondents further gave their view on health facility staff are engaged in training and refresher courses on electronic medical records management. The following findings were: 64.7% indicated strongly agree, 24.3% indicated agree, 3.7% were neutral, while 3.7% disagreed. The statement obtained a mean of 4.23 which was slightly lesser than the line item means.

In terms of whether public health facilities have sufficient trained human capacity trained in practices, the findings obtained reflected the following: 66.9% of the respondents strongly agreed, 32.4% indicated agreed while 0.7% indicated neutral. The mean and std. dev of the line item were 4.77 and 0.657 respectively inferring that there were a considerable number of participants with convergent views regarding sufficiency of trained personnel at the health facilities as supported by 99.3% of the respondents.

On whether EMR implementation improves workload management in the public health amenities. The findings are as follows; 63.2% infers SA, 29.4% denotes agree, 5.9% indicated neutral and 1.5% indicated SD, respectively. The statement recorded a mean of 4.50 and std. dev of 0.655. Comparing the statement mean to the composite mean indicates that most participants opined that EMR implementation improves workload.

The final statement under the variable; retrieval and access of patient records takes few seconds as compared to accessing paper records which takes a longer time. From findings 56.6% inferred SA, 37.8% denotes agree, 1.5% denotes neutral and 2.2% denotes disagree and 2.9% SD, respectively. The statement recorded a mean of 4.22 and a std. dev of 0.694. Comparing the statement mean to the composite mean indicates that most respondents opined that EMR implementation improves workload.

4.7.1 Correlational Analysis on the Relationship between Human Capacity and Implementation of Electronic Medical Records

The research purposed to establish the association between human capacity and implementation of Electronic Medical Records using Pearson Correlation which helps in uncovering the strength as well as the direction of relationship between human capacity and implementation of Electronic Medical Records in Government HIV Clinics. The correlation is tabulated in Table 4.12.

Table 4.12: Correlation Analysis between Human Capacity and Implementation of Electronic Medical Records

Variable		Human Capacity	Implementation of Electronic Medical Records
Human Capacity	Pearson Correlation	1	0.842**
	Sig. (2-Tailed)		0.000
	n	136	136
Implementation of Electronic Medical Records	Pearson Correlation	0.842**	1
	Sig. (2-Tailed)	0.000	
	n	136	136

**. Correlation is significant at the 0.05 level (2-tailed)

Correlation results are in Table 4.12 between human capacity and implementation of HMIS II project. The results showed a moderate positive correlation of 0.842 between human capacity and implementation of Electronic Medical Records, indicating a substantial link with p-value of 0.000 less than the significance level of 0.05. It infers that human capacity influences the implementation of Electronic Medical Records. Ford et al, (2010) agrees that for better implementation of hospital IT, healthcare organizations ought to invest in their existing workforce to develop the needed skills relating to information technology, training, support, change management and an understanding of clinical workflows. Similar findings by Fragidis and Chatzoglou (2018) validate this study's findings, indicating that human resources are important during implementation of EMRs.

4.7.2 Qualitative Analysis for Human Capacity and Implementation of EMRs

The study further gathered qualitative information regarding human capacity and implementation of EMRs. Results from the quantitative analysis showed that there is a moderately positive correlation of 0.842 between human capacity and implementation of Electronic Medical Records, indicating a significant link with p-value of 0.000. Responses obtained from the interviews with the key informants on the degree to which human capacity influenced implementation of Electronic Medical Records were captured. A respondent shared the following sentiments.

> *Without human capacity, the system crumbles. Healthcare practitioners in the system are very vital. They influence the implementation of HMIS. The first*

point of contact for a patient is with a provider. This may be a one-off encounter or a continuous encounter. Adequate patient management information should be captured and stored for future references. The willingness of health care providers to document all patient information in the Health Information Systems provided is key.

At the beginning of implementation of KHMIS, the system uptake was slow. One of the key contributing factors was lack of formal training on system use for most of the providers in the HIV clinics. The project invested heavily in training both within the facility and at county level. One thing that was apparent was the county team needed to understand the functionality of the EMR to be able to support it better. With intensive sensitizations and training there has been a tremendous improvement in system uptake and use. This has also impacted on the quality of data captured.

Results from quantitative data and qualitative data indicated that there is a link between human capacity and implementation of Electronic Medical Records in Government HIV clinics. This gives a positive indication of the significance of triangulating instruments in conducting a mixed method research approach.

4.8 Information Communication and Technology and Implementation of Electronic Medical Records

The third objective purposed to establish the extent to which information communication technology influence implementation of Electronic Medica Records in Government HIV Clinics in Nairobi City County. The variable information communication technology was measured by Likert using indicators, availability of ICT equipment, level of ICT adaptability and infrastructural capacity.

Five-point Likert scale where 1= Strongly Disagree (SD), 2= Disagree (D), 3= Neutral (N), 4= Agree (A) and 5= Strongly Agree (SA).

Table 4.13: Information Communication and Technology and Implementation of Electronic Medical Records

Statements	n	5 F (%)	4 F (%)	3 F (%)	2 F (%)	1 F (%)	Mean	Std. Dev.
1. Paper-based recording of patient information are still in use in healthcare facilities.	136	76 (55.9)	42 (30.9)	10 (7.4)	8 (5.9)	0 (0.0)	4.26	0.652
2. The use of information technology equipment requires high level technical expertise	136	34 (25.0)	28 (20.6)	9 (6.6)	35 (25.7)	30 (22.1)	3.04	1.777
3. Reports generated from the HMIS are accurate	136	42 (30.9)	38 (27.9	7 (5.1)	28 (20.6)	21 (15.4)	3.40	1.621
4. Use of ICT enhances confidentiality with patients	136	77 (56.6)	52 (38.2)	7 (5.1)	0 (0.0)	0 (0.0)	4.40	0.793
5. Healthcare workers consider implementation of EMR to be challenging.	136	79 (58.1)	49 (36.0)	8 (5.9)	6 (4.4)	4 (2.9)	4.36	0.983
6. ICT utilization improves HMIS's efficiency and effectiveness.	136	85 (62.5)	43 (31.6)	2 (1.5)	4 (2.9)	2 (1.5)	4.42	0.765
7. Availability of Local Area Network connectivity in all service areas increases the level of HMIS implementation	136	80 (58.8)	38 (27.9)	6 (4.4)	7 (5.1)	5 (3.7)	4.09	0.811
8. Availability of proper ICT security measures, enhances patients' confidence in case of fear of theft and loss of data	136	88 (64.7)	40 (29.4)	8 (5.9)	0 (0.0)	0 (0.0)	4.30	0.909
Composite mean and SDV							**3.91**	**1.039**

Table 4.13 presents the statements on the dependent variable. The means of 8 on the response variable were used to generate data were summed up and utilized in computing the composite mean and standard deviation (std.dev) that resulted to 3.91 and 1.039, respectively.

Paper-based recording of patient information is still in use in healthcare facilities. The findings obtained indicated that 55.9% of the participants strongly agreed, 30.9% indicated agree, 7.4% indicated neutral who neither agreed nor disagreed whereas 5.9% disagreed with a mean of 4.26 and std. dev of 0.652, respectively. Results show that the line item recorded convergent views from public health practitioners.

On whether the use of information technology equipment requires high level technical expertise, the data gathered as follows; 25.0% infers SA, 20.6% infers agree, 6.6% indicated neutral, 25.7% infers disagree and 22.1% infers SD with a mean of 3.04 and std. deviation of 1.777. It infers that most of the participants were of a contrary opinion on the statement drawing divergent opinions from a substantial percentage of participants.

The findings in the third statement on reports generated from the HMIS are accurate. The findings were as follows; 30.9% strongly agree, 27.9% agree, 5.1% were neutral, 20.6% infers disagree and 15.4% infers SA having a mean of 3.40 and a std. deviation of 1.621. Results show that those who disagreed accounted for 36% of participants. Comparing the statement to the composite mean (M=3.91) signifies that the statement possessed a substantial number of responses that had divergent views.

The fourth statement under the variable; use of ICT enhances confidentiality with patients. Findings tabulated in Table 4.21 show that 56.6% denotes agree, 38.2% denotes disagree and 5.1% indicated neutral. When comparison is made to the composite mean (3.91), infer that majority participants agreed that use of ICT enhances confidentiality with patients as supported by 94.8% of participants.

The aspect on whether healthcare workers consider implementation of EMR to be challenging; the research obtained results as follows; 58.1% showed SA, 36.0% infers agree, 5.9% were neutral, 4.4% infers disagree and 2.9% infers SD having a mean of 4.36 and a std. deviation of 0.983. When comparison is made to the composite mean (3.91), it shows that respondents consider implementation of EMR to be challenging.

In the case of ICT utilization improves HMIS's efficiency and effectiveness, the descriptive findings obtained were 62.5% indicating strongly agree, 31.6% agree, 1.5% were neutral, 2.9% indicated disagree whereas responses that strongly disagreed represented 1.5% with a mean of 4.42 and std. dev of 0.765. The line-item statement was greater than composite mean (M=3.91) implying that most of the responses had convergent opinions as backed by 83.9% of participants.

The aspect number seven on whether availability of Local Area Network connectivity in all service areas increases the level of HMIS implementation obtained the following results: 58.8% infers SA, 27.9% infers agree, 4.4% infers neutral and 5.1% shows disagree and 3.7% SD. The statement on the line item recorded a mean of 4.09 and a std. dev of 0.811. When comparison is made to composite mean (M=3.91), shows that there were responses that agreed upon the statement line item.

The last statement of the variable indicates that availability of proper ICT security measures enhances patients' confidence in case of fear of theft and loss of data. The results are presented as follows; 64.7% strongly agree, 29.4% indicated agree, 5.9% neutral while none of the responses either agreed nor disagreed with a mean of 4.30 and std. dev of 0.909. This implies that most responses were in congruent with that of ICT security.

4.8.1 Correlational Analysis on Information Communication and Technology and Implementation of Electronic Medical Records

The researcher purposed to establish the association between information communication technology and implementation of Electronic Medical Records using the Pearson Correlation. This helps evaluate the strength and direction of the association between information communication technology and implementation of Electronic Medical Records in Government HIV Clinics. The correlation is presented in Table 4.20.

Table 4.14: Correlation Analysis between Information Communication and Technology and Implementation of EMRs

Variable		Information Communication and Technology	Implementation of Electronic Medical Records
Information Communication and Technology	Pearson Correlation	1	0.578**
	Sig. (2Tailed)		0.000
	n	136	136
Implementation of Electronic Medical Records	Pearson Correlation	0.578**	1
	Sig. (2-Tailed)	0.000	
	n	136	136

**. Correlation is significant at the 0.05 level (2-tailed)

Correlation results between information communication technology and implementation of HMIS II project are presented on Table 4.14. Findings showed that there is a moderately positive connection of 0.578 on the link between information communication technology and implementation of Electronic Medical Records, indicating a substantial association with p-value of 0.000 lesser than the significance level 0.05. The findings indicate that information communication technology influence implementation of Electronic Medical Records. These findings agree with the study done by Gatotoh et al, (2018) who claimed low adoption of e-Health to lack of ICT skills amongst clinicians. However, findings by Qureshi et al, (2013), indicate that implementation of HMIS was due to sluggish internet use among healthcare workers. The cost of implementation was also a major factor which long affects healthcare quality.

4.8.2 Qualitative Analysis for Information Communication and Technology and Implementation of Electronic Medical Records

For comprehensive understanding of the variable, qualitative information was gathered in opinions through key informant interviews. The participants were required to give their opinion on the importance of various aspects of ICT and its contribution to efficient utilization of EMRs. Findings from the quantitative analysis uncovered that there is a moderately positive correlation of 0.578 on the link between information communication technology and implementation of Electronic Medical Records, indicating a substantial association with p-value of 0.000. This was further qualified by some information provided by the key informants. A key informant provided the following narrative about Local Area Network and EMRs.

> *The availability and accessibility of Local Area Network within a facility is key in the success of implementation of systems. For systems within the facility to communicate, they need to be connected to one network. For smaller facilities this is easy and cheaper to install, for larger facilities this sometimes can be a resource-intensive activity and might not be achieved easily. Some departments end up not being connected, which is detrimental to the implementation of systems. Additionally, the purchase of equipment like computers for all service areas has been a challenge for some facilities thus ending up entering data in the few computers provided.*

When quantitative data was corroborated with qualitative data information, it was revealed that there was a substantial association between information communication technology and

implementation of EMRs. Data triangulation was significant in providing objective results in justifying the relationship between ICT and implementation of Electronic Medical Records in Government HIV clinics in Nairobi County.

4.9 Stakeholder Involvement and Implementation of Electronic Medical Records

The fourth objective sought to examine how stakeholder involvement influences implementation of Electronic Medica Records in Government HIV Clinics in Nairobi City County. The variable stakeholder involvement was measured by likert including the following indicators: inclusivity in decision making, patient contribution in health research, level of orientation in EMR.

Five-point Likert scale where 1= Strongly Disagree (SD), 2= Disagree (D), 3= Neutral (N), 4= Agree (A) and 5= Strongly Agree (SA).

Table 4.15: Stakeholder Involvement and Implementation of Electronic Medica Records

Statements		**5**	**4**	**3**	**2**	**1**		
	n	**F (%)**	**F (%)**	**F (%)**	**F (%)**	**F (%)**	**Mean**	**Std. Dev**
1. Stakeholders within the county conduct joint supervisions on implementation of HMIS.	136	81 (59.6)	42 (30.9)	5 (3.7)	3 (2.2)	5 (3.7)	4.56	0.661
2. Stakeholder inclusion in implementation of HMIS cultivates community oriented critical thinking and synergy	136	50 (36.8)	32 (23.5)	13 (9.6)	17 (12.5)	24 (17.6)	3.50	1.024
3. Stakeholders' contributions are fundamental to the prosperity of a healthcare facility.	136	77 (56.6)	52 (38.2)	7 (5.1)	0 (0.0)	0 (0.0)	4.40	0.793
4. Stakeholders are involved in the process of healthcare budgeting and technical expertise in public healthcare facilities.	136	93 (68.4)	37 (27.2)	3 (2.2)	2 (1.5)	0 (0.0)	4.64	0.572
5. Reluctance to involve stakeholders' especially healthcare workers in decision-making is a setback to EMR implementation.	136	80 (58.8)	44 (32.4)	12 (8.8)	0 (0.0)	0 (0.0)	4.50	0.655
6. There is active engagement between patients and researchers as stakeholders in implementation of HMIS.	136	73 (53.7)	50 (36.8)	0 (0.0)	7 (5.1)	6 (4.4)	4.21	0.733
7. Stakeholders are frustrated with the level of training and length of orientation in HMIS implementation.	136	81 (56.6)	52 (38.2)	3 (5.1)	0 (0.0)	0 (0.0)	4.43	0.793

8. Patient contribution in health and research is a vital component for effective and efficient health records.	136	66 (48.5)	53 (38.9)	4 (2.9)	7 (5.1)	6 (4.4)	4.03	0.750
Composite mean and SDV							**4.28**	**0.748**

Table 4.15 presents the statements on the dependent variable. The means of 8 on the response variable were used to generate data were summed up and utilized in computing the composite mean and standard deviation (std.dev) that resulted to 4.28 and 0.748, respectively.

Stakeholders within the county conduct joint supervisions on implementation of HMIS. The results were as follows; 59.6% strongly agreed, 30.9% indicated agree, 3.7% were neutral and 2.2% disagreed while 3.7% strongly disagreed. The mean and std. dev of the line items 4.56 and 0.661 respectively were greater than the composite mean (M=4.28) indicating that the statement drew responses that were convergent and supported by majority of the respondents 90.5%.

The second statement highlighted whether stakeholder inclusion in implementation of HMIS cultivates community oriented critical thinking and synergy. The research gathered the following findings: 36.8% indicated strongly agree, 23.5% indicated agree, 9.6% were neutral, 12.5% denoted disagree and 17.6% denoted SD with a mean and std. dev of 3.50 and 1.024, respectively. Results imply that there were differing views of most of the respondents on the statement.

Stakeholders' contributions are fundamental to the prosperity of a healthcare facility. The responses obtained were as follows; 56.6% indicated strongly agree, 38.2% agreed, and 5.1% indicated neutral about the statement. The mean and std. dev of the statement (M=4.40, SD = 0.793) was greater than composite mean 4.28 and 0.748, respectively. Results show that the statement recorded positive impact on the variable signifying that the stakeholders' contributions are vital for healthcare prosperity.

On the data pertaining stakeholders being involved in the process of healthcare budgeting and technical expertise in public healthcare facilities; 68.4% indicated strongly agree, 27.2% indicated agree, 2.2% were neutral, 1.5% indicated disagree with a mean of 4.64 and std. dev of 0.572. When comparison was made to the composite mean (4.28), signify that stakeholder

involvement is usually conducted in the processes of healthcare budgeting and technical expertise.

Response number 5 showed that; 58.8% SA, 32.4% indicated agreed and 8.8% indicated neutral while statement recorded a mean and std. dev of 4.50 and 0.655. Findings show that reluctance to involve stakeholders' especially healthcare workers in decision-making is a setback to EMR implementation. This is apparent when making comparison in the line item (M=4.50) mean compared to composite mean (M=4.28) with lesser than the line item mean. It was backed by 91.2% of participants.

Statement six purposed to uncover whether there is active engagement between patients and researchers as stakeholders in implementation of HMIS. The results indicate that 53.7% show SA, 36.8% agree, none indicated neutral, 5.1% disagreed and 4.4% infer SD with a mean of 4.21 and a std. dev of 0.733. When comparison was made to the composite mean (4.28), it signifies that a substantial proportion of participants were not actively engaged in implementation of HMIS.

Statement 6: stakeholders are frustrated with the level of training and length of orientation in HMIS implementation. The findings presented indicate that 56.6% agreed, 38.2% indicated agreed, 5.1% were neutral drawing a mean of 4.43 and std. dev of 0.793. This shows that the statement possessed convergent opinions on the frustration with the level of training during orientation process. This was supported by majority of participants 94.8%, who agreed with the aspect.

The final statement gathered data on whether patient contribution in health and research a vital component for effective and efficient health records is. The findings presented indicate that 48.5% strongly agree, 38.9% indicated agreed, 2.9% were neutral whereas 5.1% disagreed while 4.4% indicated SD drawing a mean of 4.03 and Std. dev of 0.750. This shows that the statement possessed differing opinions on the contribution of patients in health and research considering the composite mean was much greater than the line item mean.

4.9.1 Correlational Analysis on the Relationship between Stakeholder Involvement and Implementation of Electronic Medical Records

Research purposed to find out the association between stakeholder involvement and Implementation of Electronic Medical Records utilizing the Pearson Correlation which helped in evaluating the strength as well as direction of the association between stakeholder involvement and implementation of Electronic Medical Records in Government HIV Clinics. The results were tabulated in Table 4.29.

Table 4.16: Correlation between Stakeholder Involvement and Implementation of Electronic Medical Records

Variable		Stakeholder Involvement	Implementation of Electronic Medical Records
Stakeholder Involvement	Pearson Correlation	1	0.501*
	Sig. (2-Tailed)		0.008
	n	136	136
Implementation Electronic Medical Records	Pearson Correlation	0.501*	1
	Sig. (2-Tailed)	0.008	
	n	136	136

**. Correlation is significant at the 0.05 level (2-tailed)

From Table 4.16 results show that there is a moderately positive association of 0.501 between stakeholder involvement and implementation of Electronic Medical Records, this infer a substantial association with p-value of 0.000 being lesser than test level of significance 0.05. The findings indicate that stakeholder involvement influence implementation of Electronic Medical Records and agrees with literature which states that, stakeholder contribution is characterized as an early and progressing procedure of building and keeping up connections in view of common trust and regard through discourse with assorted groups of onlookers about complex issues (Jones, 2015). Stakeholder inclusion cultivates vital advancement of organizations, brings about community oriented critical thinking and synergy. According to Freeman and McVea (2012), the help of all stakeholders is fundamental to an organization's prosperity and sustenance of projects. To ensure that this kind of setting is effective, organizations need a practical plan in place to meet all stakeholders' requirements and mobilize support for collective project initiation.

4.9.2 Qualitative Analysis for Stakeholder involvement and Implementation of Electronic Medical Records

From interviews with health care providers results show that stakeholder involvement influenced implementation of Electronic Medical Records. The results from the quantitative analysis uncovered that there was a moderately positive association of 0.501 between stakeholder involvement and implementation of Electronic Medical Records, indicating a substantial relationship with p-value of 0.000. This meant that stakeholder involvement and the implementation of EMRs. This was qualified by the feedback from the Key Informants. One of the participants in an interview recount.

> *How will the healthcare system understand the emerging needs of the population without involving stakeholders? The project engages stakeholders from various levels. These are the donors, the ministry, the counties, and the facility users. At various levels each stakeholder requires their needs to be met. It is important to meet all the stakeholders' needs without downsizing another's' needs. At the end of the day, everyone's goal is to ensure the patients are provided efficient care. This can only be achieved by ensuring the systems provided are up to date and user friendly with all requirements.*

Opinion was also sought on whether stakeholder involvement contributes to implementation of health management information systems. A respondent had this to say.

> *To achieve universal healthcare coverage as espoused in the Big 4 Agenda, involving stakeholders especially in a world that has emerging health issues is important. Government needs to contribute significantly in channeling funds to lower-level healthcare facilities since they are easily accessible. There has been a continuous need to have facilities well equipped. Some of the funds come from donors. There is an increasing need to also have the ministry source funds locally. The engagement of various stakeholders is key to drive the HIS agenda in Kenya.*

The results from qualitative and quantitative data show that there was a relationship between stakeholder involvement and implementation of Electronic Medical Records in Nairobi County, Kenya. The adoption of a mixed method approach justified the importance of data triangulation in research.

CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

The chapter relays summary of the findings, conclusions, discussions, recommendations, and suggestions for further studies.

5.2 Summary of Findings

The summary focused on the findings obtained from the variables in the fourth chapter.

5.2.1 Leadership Skills and Implementation of Electronic Medical Records

The first objective purposed to find out the extent to which leadership skills influence the implementation of Electronic Medical Records (EMRs) in Government HIV clinics in Nairobi County. The composite mean and std. dev of the variable were 4.14 and 0.809, respectively. There existed a weak and positive association of 0.324 between leadership skills and implementation of HMIS II project indicating a substantial link having a p-value of 0.000. The value was less than the test statistic of 0.05. This indicated that leadership skills influence the implementation of Electronic Medical records.

5.2.2 Human Capacity and Implementation of Electronic Medical Records

The second objective purposed to establish the extent to which human capacity influence implementation of Electronic Medical Records in Government HIV clinics in Nairobi County. The composite mean and std. dev of variable were 4.36 and 0.605, respectively. The results showed that there is a moderate positive correlation of 0.842 between human capacity and implementation of Electronic Medical Records, indicating a substantial link with p-value of 0.000 that is lesser than significance level of 0.05. It infers that human capacity influences the implementation of Electronic Medical records.

5.2.3 Information Communication Technology and Implementation of Electronic Medical Records

The third objective purposed to unveil the extent to which information communication technology influence implementation of Electronic Medical Records in Government HIV clinics in Nairobi County. The mean and the std. dev of the variable were 3.91 and 1.039,

respectively. Study findings showed that there is a moderately positive connection of 0.578 on the link between information communication technology and implementation of Electronic Medical Records, indicating a substantial association with p-value of 0.000 lesser than the significance level 0.05. The findings indicate that information communication technology influence implementation of Electronic Medical Records.

5.2.4 Stakeholder Involvement and Implementation of Electronic Medical Records

The fourth objective purposed to unveil the extent to which stakeholder involvement influence implementation of Electronic Medical Records in Government HIV clinics in Nairobi County. The mean and the std. dev of the variable was 4.28 and 0.748, respectively. Study findings revealed that there is a moderately positive connection of 0.578 on the link between information communication technology and implementation of Electronic Medical Records, indicating a substantial association with p-value of 0.000 lesser than the significance level 0.05. The findings indicate that information communication technology influence implementation of EMRs.

5.3 Conclusions

The research focused on establishing institutional determinants of implementation of Electronic Medical Records in Government HIV clinics in Nairobi County. The first variable sought to find out the influence of leadership skills on implementation of Electronic Medical Records in Government HIV Clinics within Nairobi County. The findings established a weak positive association between leadership skills and implementation of EMRs in Government HIV Clinics in Nairobi County. This was supported by statements developed from the variable; Health-care systems require stronger leadership to be sustainable and responsive to future health needs, leadership style, collaboration and partnership between healthcare workers is vital in implementation of HMIS.

The second variable of the research established that influence of human capacity on implementation of EMRs in Government HIV Clinics within Nairobi County. Results unveiled the existence of a strong positive correlation between human capacity and implementation of EMRs in Government HIV Clinics within Nairobi County. This implied that human capacity influencing positive attitude, involvement of health workers in decision making, retrieval and

access of electronic records, sufficient trained personnel and EMR implementation improves workload management in health facilities contribute to the variable human capacity and influence implementation of HMIS II project within Nairobi, Kenya.

The third objective of this study purposed to examine the influence of information communication technology on implementation of Electronic Medical Records in Government HIV Clinics in Nairobi County. Findings unveiled a moderate positive association between information communication technology and implementation of EMRs in Government HIV Clinics within Nairobi County. The study concluded there still exists the use of paper-based recording of patient information, utilization of ICT enhances patient confidentiality, EMR still remains a challenge among health workers, and availability of Local Area Network connectivity in all service areas increases the level of HMIS implementation and availability of proper ICT security measures, enhances patients' confidence and prevents the loss of data. These statements conclude that information communication technology influence implementation of EMRs in Government HIV Clinics within Nairobi County.

Variable number four of the study sought to examine the influence of stakeholder involvement on implementation of Electronic Medical Records in Government HIV Clinics in Nairobi County. The results unveiled that there was a moderately positive correlation of 0.501 between stakeholder involvement and implementation of Electronic Medical Records in Government HIV Clinics in Nairobi County. The study further concluded that the conducting joint supervisions on implementation of HMIS, contributions to the prosperity of HMIS, involvement in the budgetary and technical expertise in healthcare facilities, decision making and level and length of training as statements under stakeholder involvement as a variable influence implementation of implementation of Electronic Medical Records in Government HIV Clinics in Nairobi County.

5.4 Recommendations

The study recommended the following.

1. Facility leaders should be on the frontline advocating for system use to encourage the care providers to adopt and use the systems provided.

2. There is a need to continuously offer refresher training on system use to ensure users are knowledgeable of the system features.
3. It is necessary to always involve system users in decision making involving system use. This builds their confidence in the role they play in ensuring proper systems are provided.
4. There is a need to sensitize the system users on the benefits of system use, for instance easy retrieval of records and generation of reports. Most of the users still find system use to be challenging and an extra job. Paper records are still preferred to systems use.
5. To improve on accessibility of systems for all departments offering HIV care, there is need for stakeholders to think of other better ways to implements systems i.e., purchase of tablets which are smaller and handy and can be moved from one area to another within the facility compared to computers which are bulky.
6. On stakeholder involvement and implementation of EMR, there is need to continually have joint supervisions by different stakeholders within the county as it has proven to be useful in encouraging system use.

5.5 Recommendations for Further Research

Suggestions for future research are as follows.

1. There is need to study why, despite the gains of HMIS systems project implementation, uptake and adoption remains low, as most providers still prefer paper records.
2. A study of EMR implementation and the unique factors affecting the different regions in the country on systems uptake and use. There is need to determine whether the challenges are unique for each region/ county or cuts across.
3. A study on the effects of a distributed model of implementation better referred to facility hosted EMR on the success of system uptake and use. An analysis on the pros and cons and what is the best way forward for future implementations.

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APPENDIX

Appendix I: Introduction Letter

Shalin Moraa Kibwage
University of Nairobi
Nairobi

Dear Respondent

RE: REQUEST FOR DATA COLLECTION

I am a Master of Arts in Project Planning and Management student at the University of Nairobi currently conducting a research study entitled ***"Institutional factors influencing implementation of Health Management Information System II Project in Government HIV Clinics in Nairobi County, Kenya."***. You are kindly invited to take part in the Questionnaire admission exercise by providing crucial data and information meant to serve the purpose of this research.

The information you shall give will be used for academic purposes only, will be treated with utmost confidentiality and will not be shared with anyone whatsoever. Do not write your name anywhere on the questionnaire.

Thank you for your participation and effort in completing the questionnaire.

Yours Sincerely,

Shalin Moraa Kibwage

Appendix II: Questionnaire

This questionnaire seeks to find out a few things about your knowledge in implementation of Electronic Medical Records in Government HIV Clinics. Please answer each question as honestly as you can. This process is confidential, and the instruments will only be used for the purposes of this research study.

Section A: Demographic information

1. Please indicate your gender

   Male [ ] Female [ ]

2. Kindly specify your age bracket

   Below 20 years [ ]

   20 – 25 years. [ ]

   26 – 30 years. [ ]

   31 – 35 years. [ ]

   36 – 40 years. [ ]

   Above 41 years [ ]

3. Kindly indicate your level of formal education?

   Certificate [ ]

   Diploma [ ]

   Degree [ ]

   Master's Degree [ ]

   PhD [ ]

   None [ ]

4. Please indicate your position in this health facility

   Administrator [ ]
   IT officer [ ]
   Clinician [ ]
   Nurse [ ]
   Data clerk [ ]
   Counsellor [ ]

5. How long have you worked here in this facility?

   Less than 3 years [ ]

   3- 5 years [ ]

   Above 5 years and above [ ]

Section B: Facility Profile

1. How many EMR systems do you have in your facility?

   i. 1 [ ]
   ii. 2 [ ]
   iii. More than 3 [ ]

2. If 2 or more systems are in use, do they communicate/ interoperate?

   Yes [ ] No [ ]

3. Specify the mode of use of the system currently in use in the HIV clinic.

   i. Point of care (POC) [ ]
   ii. Retrospective data entry (RDE) [ ]
   iii. Hybrid (RDE+ POC) [ ]

4. Do all departments offering HIV care have access to the EMR?

   Yes [ ] No [ ]

5. What services are offered through the EMR in the HIV clinic?

   i. HTS [ ]
   ii. HIV Care and treatment [ ]
   iii. ANC [ ]
   iv. PNC [ ]
   v. Maternity [ ]
   vi. TB [ ]

Section C: Implementation of Electronic Medical Records

The following statements require your response on how much EMRs enhance service delivery in public hospitals. Use the following scale:

Use scale: 1 – Strongly Disagree (SD), 2 – Disagree (D), 3 – Neutral (N), 4 – Agree (A) and 5 – Strongly Agree (SA) to indicate your response

Statements	5	4	3	2	1
1. Electronic medical reports support evidence-based decision-making					
2. Implementation of HMIS enhances performance among healthcare workers					
3. Implementation of HMIS influences enhanced treatment, generation of reports and patient follow-up					
4. EMR implementation improves the security of medical data					
5. Local health facilities are prepared for implementation of HMIS					
6. Healthcare workers struggle to use the new technology on HMIS					
7. Adequate technological preparation enhances healthcare workers on the process of change and utilization					
8. Development of plans and assessment of resources determine the success and failure of implementing HMIS					

9. Does implementation of HMIS enhance service delivery in public health facilities?

……

……

……

Section D: Leadership Skills

The statements that follow require your response on the extent to which leadership styles influence implementation of HMIS by hospitals. Use the following scale:

Use scale: 1 – Strongly Disagree (SD), 2 – Disagree (D), 3 – Neutral (N), 4 – Agree (A) and 5 – Strongly Agree (SA) to indicate your response

Statements	5	4	3	2	1
1. Health-care systems need strong leadership to be sustainable and responsive to future health needs					
2. Leadership style influences organization culture in implementation of HMIS.					
3. Leaders support emerging physicians in understanding implementation of HMIS.					
4. Training in leadership skills such as financial, business planning and personnel management.					
5. Collaboration and partnership between healthcare workers is vital in implementation of HMIS.					
6. Transformational leadership encourages innovativeness.					
7. Healthcare workers possess a wide variety of management and leadership skill					
8. Professional credibility is the most important quality to succeeding.					

9. Is there any contribution of leadership skills on implementation of health management information systems?

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Section D: Human Capacity

The statements that follow require your response on the extent to which human factors influence implementation of HMIS by hospitals. Use the following scale:

1 – Strongly Disagree (SD), 2 – Disagree (D), 3 – Neutral (N), 4 – Agree (A) and 5 – Strongly Agree (SA) to indicate your response

Statement	5	4	3	2	1
1. Healthcare top management influence positive attitude towards implementation of electronic medical records.					
2. Frontline health workers are involved in the decision-making process of the health facilities.					
3. Health professionals would prefer manual operations to the use of computers.					
4. Retrieval and access of patient records takes few seconds as compared to accessing paper records which takes a longer time					
5. Health facility staff are engaged in training and refresher courses on electronic medical records management.					
6. Public health facilities have sufficient trained human capacity trained in practices					
7. EMR implementation improves workload management in the public health facilities.					

8. To what extent does human capacity influence implementation of health management information systems?

……

……

……

……

……

Section E: Information, Communication and Technology

The following statements require your response on how much infrastructural capacity influences HMIS implementation by hospitals. Use the following scale:

1 – Strongly Disagree (SD), 2 – Disagree (D), 3 – Neutral (N), 4 – Agree (A) and 5 – Strongly Agree (SA) to indicate your response

Statements	5	4	3	2	1
1. Paper-based recording of patient information are still in use in healthcare facilities.					
2. The use of information technology equipment requires high level technical expertise.					
3. Reports generated from the HMIS are accurate					
4. Use of ICT enhances confidentiality with patients.					
5. Healthcare workers consider implementation of EMR to be challenging.					
6. ICT utilization improves HMIS's efficiency and effectiveness.					
7. Availability of Local Area Network connectivity in all service areas increases the level of HMIS implementation.					
8. Availability of proper ICT security measures enhances patients' confidence in case of fear of theft and loss of data.					

9. How do hardware components of ICT influence implementation of health management information systems?

……

……

……

……

Section F: Stakeholder Involvement

The statements that follow require your response on the extent to which stakeholder involvement influence implementation of EMRs by hospitals. Use the following scale:

1 – Strongly Disagree (SD), 2 – Disagree (D), 3 – Neutral (N), 4 – Agree (A) and 5 – Strongly Agree (SA) to indicate your response

Statements	5	4	3	2	1
1. Stakeholders within the county conduct joint supervisions on implementation of HMIS.					
2. Stakeholder inclusion in implementation of HMIS cultivates community oriented critical thinking and synergy.					
3. Stakeholder's contributions are fundamental to the prosperity of a healthcare facility					
4. Stakeholders are involved in the process of healthcare budgeting and technical expertise in public healthcare facilities.					
5. Reluctance to involve stakeholders' especially healthcare workers in decision-making is a setback to EMR implementation.					
6. There is active engagement between patients and researchers as stakeholders in implementation of HMIS.					
7. Stakeholders are frustrated with the level of training and length of orientation in HMIS implementation.					
8. Patient contribution in health and research is a vital component for effective and efficient health records.					

10. Does stakeholder involvement contribute to implementation of health management information systems?

……

……

……

Appendix III: Interview Guide

(Administered to key personnel in the facility)

Background Information

Kindly indicate your gender .....

Kindly indicate your age in years ....

Implementation of Electronic Medical Records

1. Does implementation of HMIS enhance service delivery in public health facilities?
2. Is the ratio of healthcare workers to patients sufficient?

Leadership Skills

3. How do leadership skills influence implementation of electronic medical records?
4. Is there any contribution of leadership skills to influence implementation of health management information systems?

Human Capacity

5. To what extent does human capacity influence implementation of health management information systems?
6. How do health facilities involve both internal and external customers in health projects?

Information Communication Technology

7. How do hardware components of ICT influence implementation of health management information systems?
8. In your opinion does the use of the internet contribute to efficient utilization of electronic medical records?

Stakeholder Involvement

9. Do you think stakeholder involvement in public health facilities is necessary in implementing health management information systems?
10. Does stakeholder involvement contribute to implementation of health management information systems?