

EFFECT OF HOSPITAL MANAGEMENT INFORMATION SYSTEM
FUNCTIONALITIES ON THE PERFORMANCE OF HEALTH CARE
INSTITUTIONS IN KENYA: A CASE OF THE NAIROBI HOSPITAL

by

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A thesis presented to the School of Business and Economics

of

Daystar University
Nairobi, Kenya

In partial fulfilment of the requirements for the degree of

MASTER IN BUSINESS ADMINISTRATION
in Strategic Management

August 2020

APPROVAL

EFFECT OF HOSPITAL MANAGEMENT INFORMATION SYSTEM
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DECLARATION

EFFECT OF HOSPITAL MANAGEMENT INFORMATION SYSTEM
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I declare that this thesis is my original work and has not been submitted to any other college or university for academic credit.

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ACKNOWLEDGEMENTS

Firstly, I would like to express my gratitude to the Almighty God for giving me the wholeness of spirit, soul and body throughout this thesis writing process. He has strengthened me and given me the grace and good health to go through school, especially when writing this thesis. I am thankful for His provision and protection throughout my academic journey.

Secondly, I would like to appreciate my supervisors, Ms. Celestine Musau and Mr. Joseph Munyao, for the support they have given me while undertaking this thesis. Last but not least, special thanks to my loving husband, Rommel Shangala, my children, my mum, and my parents in-law for their moral support, love and encouragement. Without them, I could not have successfully completed this thesis.

May God bless you all.

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LIST OF ABBREVIATIONS AND ACRONYMS

ANOVA	Analysis of Variance
EHC	Electronic Health Card
EHIT	Electronic Health Information Technology
EHR	Electronic Health Record
EMRS	Electronic Medical Record Systems
ER	Emergency Rooms
HIS	Health Information Systems
HMIS	Hospital Management Information Systems
HR	Human Resource
HRR	Hospital Readmission Rate
HRRP	Hospital Readmissions Reduction Program
ICT	Information and Communications Technology
IPPS	Inpatient Prospective Payment System
IT	Information Technology
NWH	Nairobi Women's Hospital
PWT	Patient Wait Time
QSR	Quality System Requirements
RDT	Resource Dependency Theory
SPSS	Statistical Package for the Social Sciences
TAM	Technology Acceptance Model
TRA	Theory of Reasoned Action
WHO	World Health Organization

ABSTRACT

The essence of this research was to determine the effect of hospital management information system (HMIS) functionalities on the performance of The Nairobi Hospital. The specific objectives were to determine the HMIS functionalities of The Nairobi Hospital, determine the performance of The Nairobi Hospital, and determine the effect of the HMIS functionalities on the performance of The Nairobi Hospital. The study employed a descriptive research design, and the target population comprised 1,200 staff members. The sample size was 120 respondents who were selected through stratified random sampling. Data was collected using a questionnaire and analyzed using the Statistical Package for the Social Sciences (SPSS) version 22.0. The study revealed that the hospital had adopted medical record management functionality at 90(97.8%), laboratory information management functionality at 84(91.3%), procurement management functionality at 90(97.8%), pharmacy management functionality at 47(51.1%), doctor/nursing functionality at 70(76.1%), and management/management information system (MIS) reporting functionality at 31(33.7%). It further revealed that the hospital had over the years improved its performance and that HMIS functionalities had led to improved patient turnaround time and efficient service delivery at 76(82.6%). The study concluded that The Nairobi Hospital had over the years achieved both growth in revenue and also improvement in patient satisfaction. The study recommends that the management of The Nairobi Hospital should work towards ensuring that all the HMIS functionalities in all its departments are fully integrated so as to enhance efficiency in operations and, in turn, reduction of patient costs while at the same time maintaining the quality of healthcare.

CHAPTER ONE

INTRODUCTION AND BACKGROUND OF THE STUDY

Introduction

Globally, HMIS functionalities have become an essential constituent of technological innovation in hospitals. This is because several dimensions control performance of hospitals and a big number of stakeholders are involved, thus, interests are either overlapping or conflicting (Munga, 2013). Data management and automation have contributed towards fast improvements across the globe. Nearly all fields that human beings operate on already engage computers (Weick, 2014). The use of Management Information Systems (MIS), in the sector of health has remarkably increased across the globe for a big number of reasons, including saving of labor, advanced inspection of hospitals' functioning, improved planning and care for patients (Gordon, 2014). Hospitals make very essential centers for delivery of proper healthcare to clients, healthcare technology, and the medical care organization of systems of delivery has transformed (Wang, 2015).

Strengthening the health systems is a worldwide primacy and amongst the major constituents is the essence of improving HMIS functionalities. World Health Organization (WHO, 2014) described health systems as a combined effort towards collecting, processing, reporting, and using health knowledge and information for effective making of policies, research, and programming action (Toss, 2013). Towards fulfillment of that task, HMIS functionalities are supposed to borrow on data that is of high quality and complete from health facilities and population grounded sources. Making sure that patients get medical care of good quality has turned out a significant objective for national, district and county systems of health in the developing and the developed nations alike (Tadinen, 2015).

The HMIS functionalities are a key interest for the government together with its associates, and already a core constituent of public health restructuring (Sussman, 2013). Nonetheless, application of HMIS in Nigeria has constantly struggled with application of MIS towards supporting its private and public strategies on health with some degree of success (Guinan, 2014). Inter-alia nations that plan for programs and make decisions in the health sector as well as associated fields cannot be devoid of establishment of a successful HMIS (India's National Policy on Health, 2015). Countrywide, organizational structure is supposed to be developed towards procuring vital information on health, which may offer aid to the national medical care management and operative activities' decentralization (Shehab, 2015). About 90% of doctors in Kenyan hospitals use a manual process, such as telephones, mobiles, fax, and paper cards among others of exchanging clinical health information about patients during a referral process from one hospital to another for specialized/advanced healthcare services (Otieno, 2013). As a result, the doctors working in the Referral Hospital have just limited access to information about the referred patients (Mutuma, 2014).

In reaction to various researches and highlighting by the media on deprived quality, growing expectations of the stakeholders and patients, managers of the hospitals are facing increased pressure towards providing quality medical care (Ashraf, 2014). There is a growing pressure on monitoring service quality grounded on the feedback from consumers. Scientific success, satisfaction of patients, and accessibility are components of value health care (Pinto, 2015). To monitor, control, coordinate, and supervise a big health organization has its hardships as result of delayed, incomplete, and sometimes incorrect availability of data. For purposes of delivering proper medical care, scientific, and fast policy-making is critical which directly depends on

relevant, valid, and reliable information present in an identified span of time (Motwani, 2015). In this case, an individual has to utilize computer grounded approaches to store, handle, process, and retrieve information.

Already there exists a necessity of developing a reactive HMIS for health division to manage the load of information and facilitating effective making of decisions at different levels (Kuang, 2013). An increase in HMIS technology internationally is elevating the efficacy of delivery of health services, reduction of medical mistakes, refining care quality, and giving proper information for physicians and patients (Lorch & Pollar, 2014). The general goal of the function of management of information is obtaining, managing and using information towards improving medical and health care services, governance, performance, and support and management processes (Dong, 2014). Safety and the quality tend to be the topmost priorities for specialists in the management of a hospital. The made decisions and the taken actions by the managers of hospitals impacts directly on the care of a patient.

Based on the argument by Shortliffe and Cimino (2016), HMIS functionalities is an integrated and comprehensive information system structured towards managing the clinical, financial and administrative hospital aspects and involves processing of information that's paper-based and also storage and processing equipment. HMIS functionalities entails people, software and hardware handling the systems. HMIS functionalities standardizes reporting by management towards supporting patient care and administrative applications and reducing effort and time used on health knowledge employees like nurses, pharmacists, and doctors (Bajwa, 2013).

Hospitals in particular are very composite institutions, having unique features, that entail large units and departments coordinating patients' care (Amoaka, 2014). For

preventing readmissions, managers of hospitals are required to establish an all-rounded method for following up with patients who are already discharged. Hospital personnel are supposed to be knowledgeable of the whole medical background of a patient, especially in case a patient tables a highly risky case. Based on research above 25 per cent of readmissions in thirty days of discharge include conditions not related to the original admission, it is important for managers of hospitals to develop protocols for personnel that entail looking for more conditions which would result to re-hospitalization (Ayodele, 2014).

Background to the Study

Hospital Management Information System Functionalities

Hospital management information system entails integrated software structured for capturing data in various hospital sections and ensuring that the systems function effectively (Garrido, 2014), handling workflow of regular health services and supporting clinical, administrative and financial data management. On the other hand, HMIS functionalities entails the hospital management information system appropriateness and effectiveness in data acquisition, processing and data quality so as to ensure smooth flow and efficiency of operations in the hospital (Chand, 2015). HMIS functionalities aim to support high-quality, efficient, patient-centered care with integrated support for the administrative and management tasks needed to support such care (Jerome, 2015). HMIS functionalities have been shown to decrease the cost of quality care and the accessibility time to patient records (Winch, 2014).

Hospital management information system functionalities should ensure availability of correct information to the relevant individuals at appropriate timing (Ogunyade, 2014). Enhancing healthcare quality is a global matter, just as the use of HMIS

functionalities as a possible way of accomplishing it (Lorenzi, 2013). Health care may be a need in guaranteeing the social well-being and ensuring the public interest is maintained across the country. Within the introduction of preventive and curative health services, it is seen that data frameworks give more prominent comfort to patients and doctors through an electronic database (Lau, 2013). The role and significance of information systems within the health sector has gained prominence since information systems facilitate the efficiency and effectiveness of administrating health care to the public.

Hospital management information system functionalities clearly appear the results of organization execution of healthcare teach within the division as well as malady measurements (Jerome, 2015). It is conceivable to form different judgments of the information given by the information systems approximately the success rate of the organization service delivery. HMIS give a built up system involving different data concerning managerial, financial and medical operations of a certain health sector institution (Cheelo, 2013). The first use of the systems tend to be restricted to, recording the information of a patient and billing of the offered health services (Geri, 2014).

Presently, fresh operations have been included to management information systems of patients like having an appointment on the internet, following up on the patients, requesting analysis as well as displaying outcomes (Lipinge, 2013). Therefore, doctors are now capable of transmitting their needs straight to the laboratories through the automation systems as well as monitoring outcomes online. Further, HMIS can be classified into outputs, processes and inputs. Inputs allude to the resources; processes involve the manner in which sources of data and indicators tend to be selected and

data are gathered as well as managed. Outputs involve generation, dissemination, and utilization of information.

There is a division between health services' consumers (patients), persons paying those services (taxpayers) and services providers (hospitals) amongst others. In addition, institutions of health care encounter even more pressure on implementing success tools of management today (Chand, 2015). Thus, the HMIS application on organizations of health care can give essential aid on tracking activities that do not create and value, controlling expenses as well as enhancing the effective use of limited resources.

Hospital management information system functionalities enable the capturing and information dissemination to the makers of decisions for proper healthcare coordination at population and personal levels (Turbit, 2013). There exists 6 HMIS functionalities; HMIS resources: planning, regulatory and legislative frameworks needed to make sure of a wholly operational health information system, as well as resources needed for ensuring that kind of system is operational (Winch, 2014). The resources engaged are ICT, financing, personnel, logistics support, and mechanisms of coordinating in and amongst the six constituents (Vitale, 2016).

Indicators refers to a basic combination of indicators and associated targets for the three areas of health information like respecting persons' dignity, autonomy towards participating in decisions related to health and confidentiality tends to be ground for a strategy and a plan for an information system of health. Indicators are supposed to entail health determinants, health system outputs, inputs, and results; and status of health (Sahay, 2012). Sources of data may be classified into two major divisions: approaches based on population (population surveys, civil registration, censuses) and

data from institutions (records of persons, records of service and records on resources). Nonetheless, some other sources and approaches of collecting data like random health research, surveys and information generated by community-based institutions don't fit any of the 2 major categories though can give essential information which might not be available anywhere else Lorch and Pollar (2014).

Data management looks at all factors of handling data like gathering, storing, quality-assurance, flow, processing, compilation, and analysis. Specific necessities for timeliness and periodicity are set where essential for instance in disease surveillance cases (Vimla, 2014). Information products refers to transformation of data to information which is going to be the grounds for knowledge and evidence towards shaping health activities (Meyers, 2011). Use and dissemination is health information value and may be improved by readily availing it to the makers of decisions through giving focus to organizational and behavioral constraints as well as giving incentives for use of information (Pinto, 2015).

Performance of Health Care Institutions

Performance refers to the work outcomes since it gives the robust connection to an organization's strategic, satisfaction of customers and contributions to the economy (Tangen, 2015). The performance concept as well alludes to the transformation that the organization's governing agency and managers apply and control a programme that measures present organizational performance levels and afterwards produces ideas to modify the behaviour of human beings in the organization (Armstrong, 2015). Performance defines the results of different procedures and practices of an organization, which happen during everyday activities. The basic performance goals include increasing the efficiency and the effectiveness of the organization towards

improving the organization's capacity for delivering services or goods (Richard, 2015).

Performance of an organisation is affected by different aspects like the employee's skills, systems of the organization and joint values (March & Sutton, 2017).

Performance' significance is creating value (Carton, 2014). Wherein the received value from provided assets by shareholders tends to be more than substitute options for investments, those assets as capital will constantly be given to that particular organization ending in the constant survival of that organization. To sum, an organization's viability is to be measured by if or if not the customers are gratified or profits are sustainable economically (Bavik, 2016). The performance of an organization entails three particular areas of a company outcomes, which include; financial performance (return on investment, return on assets, profits); Product market performance (share of the market, sales) and return to shareholders (total return to shareholders, economic value added) (Richard, 2015).

During this research, performance was assessed through performance of the health system. Performance of the health system has various factors including the health of the population, outcomes of health after treatment, quality of healthcare and the relevance of care, productivity, equity and responsiveness (Obasan, 2014). Generally, measurement of performance aims at monitoring, evaluating and communicating the level by which different health system aspects fulfill their main objectives general. Heller (2014) described performance as achievement of a certain job measured in contrast to pre-set recognized standards of speed, cost, completeness and accuracy, completeness.

For instance, in many developing nations in the continent of Africa, in Kenya, diseases that are preventable and deaths that are premature continue to inflict a big rise in communities and their people as a result of insufficient accessibility to primary services of health affecting different social groups, areas, regions and communities in these nations (Lenzi, 2014). A big number of public hospitals have previously encountered dissatisfaction of employees presented on the basis of denial over offering services as a result of failing to pay the dues, poor environment of work, insufficient infrastructure as well as no managerial commitment towards engaging workers (Mwaki, 2013). The gap on delivery of services in public and private hospitals has resulted to patient's unjustified suffering who depend heavily on the provided services by hospitals (Ajayi & Tokon, 2015). Medical specialists need up-to-date information where they want to keep speed with fresh information on healthcare and application of HMIS becomes significant. There's less proof of any that a big number of health specialists in the nation of Kenya have proper accessibility to reliable and adequate information therefore Kenya is constantly being harassed by preventable communicable diseases like HIV/Aids, mortality of children, nutritional deficiency, tuberculosis, deteriorating facilities of health amongst others (Gatero, 2014).

Performance indicators in institutions of healthcare entail patient-wait-time, savings on cost, the hospital readmission rate, and safety of patient. Patient-wait-time is amongst the very significant factor of contentment of a patient. It determines how much time one takes from registration on visiting the hospital to when you see the doctor and obtain treatment. In particular, it may be exciting to determine in Emergency rooms (ER) for purposes of evaluating how ready a hospital is towards delivering services that are urgent to the patients (Ochieng, 2015). This metric of

healthcare is highly related to the score of patient contentment, since nobody really is pleased at staying in hospital for many hours. As well, it may show some more challenges faced by the fact, where the figures are very high, that needs attention and subject to address (Peil, 2013).

Cost control are key metrics for tracking since they impact directly on the finances of a hospital, the margin of contribution made by the facility of health care and the capability of that facility sustaining itself (Rajula, 2016). The objective is not reducing it greatly for making profit, but spotting exaggerated or abnormal expenses and addressing them. HMIS can subdivide it into different categories -per age groups, per operations or per units. Through acknowledgement of those costs, a facility may as well budget and enable the appropriate amount of funds to head to the appropriate category (Sakai, 2014).

The readmission rate of a hospital gives the information concerning how many patients come back to the facility in a short duration of time after they are released from that hospital. It's amongst the very significant metrics of healthcare since it gives good preview on the care quality given in the concerned hospital but may not be employed as the only indicator of quality (Shortliffe & Cimino, 2016). Rates of readmission can as well show other defects that the management of the hospital is facing like lacking personnel, relevant material, overloaded personnel neglecting details, units that have unique needs, and might aid in proper cost control because it focuses on decreasing unnecessary and expensive readmissions (Shortliffe & Cimino (2016).

Safety of patients is described as a subject in the sector of healthcare, which utilizes methods of safety since to achieve the go of a system that is trustworthy towards

delivering healthcare. Safety of patients is as well a feature of systems of health care, it reduces the occurrence and boosts recovery from unfavorable occurrences (Emanuel et al., 2008). In addition, safety alludes to harm prevention to the patients. Hughes (2008) also stated that the safety of patients may be accomplished by emphasis focused on the delivery system of healthcare that mitigates errors and capacity to learn from occurring errors

Hospital Management Information System Functionalities and Performance

Chand (2015) described an institution of health care as a nonprofit or public organization which offers medical care and services related to health, counting provision of outpatient and inpatient care, therapeutic or diagnostic services, laboratory services, nursing care, medicinal drugs, supported living, housing and elderly care, counting the retirement generations and the applied equipment or important for healthcare provision and services related to the same. There exists four major participants in the sector of healthcare: patients, who are persons receiving health care offered by the providers; providers - these are organizations that offer care to the concerned patients, charge those who pay for the care given, and purchase products from the vendors; payers - organizations paying providers of healthcare for services give, which entails private employers, insurance carriers, government as well as persons and the sellers:- selling medical devices, pharmaceutical services, products and answers to the providers.

Hospital management information system gives the advantages of streamlined operations, improved control and administration, superior care to the patient, strict control on cost and enhanced profitability (Ndetei, 2013). There is a belief that enhancing quality of services of medical care, Schreiweis and Heilbronn (2016) stated

that in the modern day world, HMIS tends to be an important component of care to patients. It gives appropriate information, to appropriate individuals and at ideal place. The HMIS are the answers to care for patients and aids them in making appropriate decisions (Patrice & Vimla, 2014). HMIS has turned out quite important to the system of healthcare, partly stimulated by development of technologies in communication and digital applications over the previous 2 decades. That is the reason the system of HMIS is the fresh advancement of the system of healthcare (Chamorro, 2013).

Health Care Institutions in Kenya

The system of health care for Kenya describes six hierarchy levels, that is: level 1 – community services; level 2 - clinic and dispensaries, level 3 - nursing homes, maternity and health centres, level 4 - medium-sized private hospitals and sub-county hospitals; level 5 - large private hospitals and county referral hospitals and large; level 6 - large private teaching hospitals and national referral hospitals (Waweru, 2014). According to the Kenya Health Policy of 2016, the country has made remarkable progress in improving key health indicators over recent years. The government's health goal is attainment of universal health care coverage for key services, including maternal, neonatal and child health services. These priorities are reflected in the country's budget for 2016/2017 (Okelo, 2015).

The private sector market is huge and plays an important role in improving people's health in most parts of the country. They ensure that they have the best doctors to offer the services as they are required (Njau, 2014). The private sector has almost 70% control of the doctors in the market and it limits people as only those who can

afford the private fees are in a position to access the facilities. The concentration of the hospitals is mainly in the urban areas with the majority of the hospitals located in Nairobi (Kioi, Cowden, & Karodia, 2017). The private hospitals in Kenya are considered to be developed and are an important source in the care of patients.

According to Burger (2017), at least 47% of Kenyans seek the use of private facility when they are unwell and the importance of their role in the hospitals is seen by the government that has sought to ensure that the private sector is developed as the nation forge forward to the achievement of Vision 2030. Private hospitals play a big role in the provision of services in health care and improvement of efficiency and offering better quality care (Ndeti, 2013). The sector helps as it competes with the public sector that makes them improve on delivery of their services. The reforms in the private health sector has helped in improving growth that saw it as an alternative in ensuring that provision of services was effective. The growth of the sector is spurred by deteriorating performance in the public hospitals and lack of resources.

There are more than 25 known private hospitals in Kenya where most of them are located in Nairobi (Mwaki, 2013). The health system in Kenya is greatly affected by the private hospitals available although many that have access to the hospital are members of a scheme in their different places of work. The private hospitals are known to be short stay, as they do not encourage stay for long periods. It is evident through the pricing of the different services that they offer (Auka, 2017).

The Nairobi Hospital

The Nairobi Hospital is a world-class referral hospital in the heart of Nairobi, which has excelled in medical expertise and services provision and has deservedly earned recognition throughout East Africa and beyond (The Nairobi Hospital, 2019). The

mission of the hospital is to offer patients the best care, using advanced technology in an atmosphere of trust, safety and comfort. Expansive investment in latest technology and medical equipment has enabled the Nairobi Hospital to establish leadership in medical procedures both in Kenya and outside (Kazanchi, 2014). The Nairobi Hospital takes pride in their highly qualified professionals who deliver their mission every day, translating their knowledge and expertise to internationally compliant practices in healthcare provision (The Nairobi Hospital, 2019). The Nairobi Hospital has for over eight years, been using Care 2000 system supplied by Symphony a limited liability company with partnerships locally and internationally. With an objective of meeting the stated requirements of The Nairobi Hospital, symphony proposed a complete suite of integrated applications covering the enterprise needs of the Nairobi Hospital. They had offered a turnkey applications solution approach. They offered not only the integrated suite of healthcare applications, but also optional interfaces with biomedical equipment and other devices and an integration option with Care 2000 (The Nairobi Hospital, 2019).

Symphony had offered all the associated services that The Nairobi Hospital needed for a successful implementation (The Nairobi Hospital, 2016). However, with this setup the hospital continued to experience problems relating to lack of integration of information and in some areas manual processes were the order of the day (Mailu, 2015). Due to system downtimes and instability, errors continued to be experienced and the posting of patient charges in some areas was incomplete (Mutuma, 2014). There was, therefore, a high incidence of reversion to manual processes when system disruptions occurred which resulted in increased inefficiencies, customer complaints, inaccuracies, increased staff costs, and increased time taken to process transactions (Mailu, 2015).

In 2017 the hospital made a decision to implement an integrated hospital management system whereas the previous system did not succeed and the need for a system that will help improve efficiency was paramount. The key business requirements expected from the integrated HMIS functionalities include: improved patient care, improved work efficiency, improved financial control, improved capture and reporting of financial information to aid in decision-making, improved system security to eliminate chances of any pilferage and savings on costs through identification of primary cost drivers at hospital level (The Nairobi Hospital, 2019).

Statement of the Problem

To manage all information related to the patient record and hospital inventory, all hospitals rely on HMIS functionalities (Wang, 2015). The use of hospital management information systems enhances the performance of hospitals through patient satisfaction, health care cost saving, efficient service delivery and growth in revenue. Despite the importance of HMIS functionalities, hospitals in Kenya face the challenge of successful application of HMIS functionalities due to the lack of resources to engage in user-education and inability to employ experts who suitably accomplish the information technology activities (Kiluu, 2014).

Research has been carried out regarding HMIS functionalities and performance. Demokaan (2018) focused on HMIS functionalities in the sector of health and Turkey's development. However, the above study focused on HMIS functionalities and didn't address the issue of performance whereas the present study seeks to focus on the effect of HMIS functionalities on the performance. Kyalo and Otieno (2019) focused on the transformation of the health sector in Kenya by adopting integrated HMIS. Nonetheless, a gap exists as the above study focused on transformation of the

health sector in Kenya by adopting integrated HMIS whereas the extant study seeks to focus on the effect of HMIS functionalities on the performance. This study was, thus, timely in determining the effect of hospital management information system functionalities on the performance of health care institutions in Kenya: A case of The Nairobi Hospital.

Purpose of the Study

The purpose of this study was to determine the effect of hospital management information system functionalities on the performance of The Nairobi Hospital.

Objectives of the Study

The research addressed the specific objectives that follow:

1. To determine the hospital management information system functionalities at The Nairobi Hospital.
2. To establish the performance of The Nairobi Hospital's management information system functionalities.
3. To identify the effect of the hospital management information system functionalities on the performance of The Nairobi Hospital.

Research Questions

The study aimed to answer the following questions:

1. What were the hospital management information system functionalities at The Nairobi Hospital?
2. What was the performance of The Nairobi Hospital's management information system functionalities?
3. What was the effect of the hospital management information system functionalities on the performance of The Nairobi Hospital?

Justification for the Study

Guaranteeing that patients get quality medicinal services has turned into an essential target for the wellbeing frameworks in both developed and developing nations. Earlier research has placed that fruitful application of hospital management information systems in health care seems, by all accounts, to be a troublesome assignment (Magutu, 2015). Hospital management information systems is extremely basic for innovative decade since social insurance organizations present a sector where performance management is organized by numerous measurements since they have numerous partners with clashing or conflicting interests.

Significance of the Study

The study's findings may be very significant to many stakeholders, including the management of the hospital, makers of policies and researchers. The management of the hospital can use the study's findings for the project of HMIS functionalities. Makers of policies and planners, the Health Ministry and some hospitals can benefit from the study's findings because the research provides the knowledge gaps and bottlenecks encountered in the course of HMIS functionalities application in the sector of health, and state strategies to make the system more ideal. The knowledge might aid the management of the hospital in fashioning better HMIS functionalities for purposes of their performance enhancement.

Scope of the Study

This study looked at what the HMIS functionalities did and how it influenced performance. The study was carried out at The Nairobi Hospital, which had a staff population of 1,800 (The Nairobi Hospital, 2019). The study, however, focused on a target population of 1,200 staff members that work with HMIS functionalities on a

daily basis and they had sufficient information on HMIS functionalities in the hospital as well as the level of performance after HMIS functionalities was introduced which helped in addressing the research objectives. The following departments comprised the target population; management, finance, procurement, ICT, doctors, nurses, laboratory, pharmacy and medical records. The sample size was composed of 120 staff members from the above departments that was chosen through stratified random sampling.

Limitations and Delimitations of the Study

This research might had some limitations. To start with, the researcher anticipated that some of the respondents might not have provided the complete information because of having the distress that their information might have been used against them or their institution. The researcher assured them of confidentiality and that there would be no sharing of any information provided.

Other respondents declined to fill the questionnaires for distress that their information might be used to intimidate them. The researcher handled the challenge by attaching an introduction from the university to the questionnaire and guaranteeing them that the information gathered was to be put confidential and purely employed for purposes of academics.

The study anticipated difficulties in getting information from participants. The researcher minimized this by ensuring that the questions remained objective.

Definition of Terms

Performance: The achievement of a provided task determined against set recognized standards of speed, cost, completeness and accuracy (Saleh, 2013).

Management: Entails interlocking operations of establishing policies for the organization, directing, controlling, planning and organizing the resources of an organization for purposes of achieving the policy's objectives (Srinivas, 2015).

Systems: A purposeful, organized structure, which entails interdependent and interrelated elements, established for carrying out a certain activity, performing a duty or solving a challenge (Nowduri, 2013).

Hospital management information system: This entails integrated software structured for capturing data in various segments of the facility, handling workflow of regular health services and supporting clinical, administrative and financial management of data (Garrido, 2014).

Hospital management information system functionalities: These are the hospital management information system appropriateness and effectiveness in data acquisition, processing and data quality to ensure smooth flow and efficiency of operations in the hospital (Chand, 2015).

Summary

Chapter one has presented the introduction of the study, the background to the problem and stated research questions, the purpose statement, the objectives, the significance of the study, assumptions, the limitations and delimitations of the study, scope of the study and the definitions key terms used in the study. The next chapter present a review of literature concerning hospital management system and performance.

CHAPTER TWO

LITERATURE REVIEW

Introduction

This chapter contains a comprehensive literature review of past studies and arguments from journals related to the current topic. The chapter examines what various scholars and authors had documented about the effect of implementing hospital management system on the performance. The chapter concludes with a conceptual framework, which is a diagrammatic representation of the relationship between the independent variable and the dependent variable.

Theoretical Framework

Theoretical frameworks are the structure through which research is interpreted, thus, a theoretical framework seeks to comprehend, predict and explain phenomena (Cooper & Shindler, 2013). There are various technology approval and utilization theories that explain the effect of information technology system on performance. The study was guided by four theories/models, namely the theory of DeLone and Mclean information system success model, theory of the innovative firm, technology acceptance model (TAM), and resource dependence theory.

McLean and DeLone Information System Success Model

McLean and DeLone initiated McLean and DeLone information system success model in the year 1992. This model has been discovered as an important framework to organize information system measurements of success. This model has broadly been employed by researchers of information systems for comprehending and determining the success of information systems, every variable defining the information systems' success was in line with either of the six main dimensions of

success of the advanced model. The pursued model by McLean and DeLone on the success of information systems is that it aims at offering a comprehensive and total comprehension of the success of IS. This model performs that by identification, description and explanation of associations amongst the very essential success dimensions besides which the evaluation of the information systems is done. McLean and DeLon's model described 6 interdependent variables employed towards measuring the success of the information systems, including; quality of the system, quality of information, quality of service, intention or use, satisfaction of the user and the overall benefit (McLean, DeLone & Petter, 2014).

Quality of the system is the expected features of a certain system towards creating information which is supposed to be used by makers of decisions and users. Quality of service may be determined based on the performance of the service and the extent of anticipated service (McLean, DeLone, & Petter, 2014). The incorporation of use being a way of measuring success needs consideration and a reply to these questions; how much is the system utilized, what's the quality and the nature of the system on. The displayed attitudes by the consumers during their interaction with the intranet are key towards measurement of failure and success of anticipated outcomes. The constructs of satisfaction of the user, utilization and overall benefits are interrelated in that expected benefits that the system offers inspires the system usage and thus satisfaction to the user (Zigurs, 2014).

Despite that McLean and DeLone stayed that the usage of the system is the best variable to measure the effectiveness of information system (IS), nonetheless, the intent for using is as well a key part of the success of the system because psychologically the user may not utilize the system where she or he doesn't have the intent to use already. The theory was appropriate in this research since the success of

information systems relies on if there existed quality of information, quality of service, usage or intent for usage, satisfaction of the user and overall benefits. This was key in making sure of the execution of the hospital management information system, which as a result improve how the institutions of healthcare performs in the nation of Kenya.

Theory of the Innovative Firm

Based on this theory, the firm's function is transforming resources that are productive into services and goods which may be commercialized. A company may achieve this through innovation. Likewise, superior performance of an organization come from enterprises that are innovative and create goods of greater quality at affordable or lower costs (Davidsson, Sapienza, & Zahra, 2006). Innovative companies have the capacity of transforming resources that are productive into less costly and high quality services and good resulting to an advantage for the clients as well as other economy players (Noe, Hollenbeck, Gerhart, Wright, 2017). Based on this theory, a company has the capacity of gaining and sustaining it's competitive edge to effectively compete within its sector by innovation. A firm that is innovative might as well innovate towards retaining the share of the market in contrast to an innovative rival or gaining a strategic position in the market (Teece, Heaton, & choemaker, 2018).

Innovative companies have the capacity of competing by innovation in comparison to quantity and price. Innovative companies turn out competitive through investing on quantity and quality productive resources. That allows the companies to grow superior services, products and quite efficient approaches, that is, marketing, organizational and production approaches. On the short-run, a firm that is innovating is not defined by a rose in costs but generates products of high-quality resulting to a

decline in the cost of a unit with a rise in the share of the market (Matray & Hombert, 2016). Innovation allows the firm that is innovating to gradually penetrate different segments of the market grounded on the various buyers' economic powers. This gives a ground on which companies can build capacity of accessing other segments of the market (Teece, Heaton, & Schoemaker, 2018). The theory was important in describing the impact of HMIS on how the institutions of healthcare perform in Kenya, particularly the Nairobi Hospital.

Technology Acceptance Model

According to Davis (1989), this model intends to give an explanation of the behavioral intention of a prospective user to apply a technology automation. TAM is grounded on Reasoned Action Theory, which aims at explaining behavior and involving two basic predictors; apparent convenience of usage and apparent usefulness and dependent variable behavioral intention, which TRA presumed as closely connected to real behavior. This theory contends that the acceptance of individuals to the fresh technology is measured by two technology perceptions; perceived convenience of system usage and perceived system usefulness (Kithaka, 2014). Perceived convenience of usage as well impacts in a noteworthy way an individual's attitude through two major approaches: instrumentality and self-efficacy. Perceived convenience of usage can as well instrumentally contribute to enhancing the performance of a person. Because of the reality that a user is going to have to use less energy with a tool, which is convenient to employ, he is going to have the capacity of sparing efforts to achieve other jobs (Davis, 1989).

The fundamental objective of the TAM is providing an outline of aspects that affect acceptance of technologies of self-service generally. Additionally, the model assists

practitioners and the researchers in identifying the reason for unacceptability of a certain system (Davis, 1989). Utilizing a system of information is openly measured by the intention of using it, that then is affected by the attitudes of the users to usage of that system and apparent system usefulness ((Davis, 1989). Apparent usefulness and attitude tend to be effected by apparent convenience in usage. The theory is relevant to this study since the important role played by the apparent convenience in usage in adoption of hospital management information system renders it vital in contributing to organizational performance. The theory happens to be significant to the research as it sought to ascertain the economic value anticipated by the hospital management information system adopters and helped in ensuring that hospital management information system enhances performance of health care institutions in Kenya.

Resource Dependence Theory

This theory was initiated by Salancik and Pfeffer (2010) and states that power is grounded on resources control which is deemed strategic in the institution. Resource dependence theory originated from the theory of open systems as companies have different levels of Reliance's on the outer environment, in particular the resources needed for them to function. Thus, poses a challenge to the company that is encountering uncertainty on acquisition of resources and brings about the concern of dependency of a firm on the surrounding for essential resources (Pfeffer & Salancik, 2010). An insufficiency in tactical resources (which are, core competencies) is viewed as a stimulus for collaboration and way of cutting down uncertainty and controlling the dependency (Barney & Hesterly, 2014). Resource dependence perspective (RDP) sufficiently identifies the interior-exterior connection as well as its integration. Based on this perspective, a firm is supposed to be seen as an open system and not deemed

as a unit targeting just the interior affairs as a closed system (Pfeffer & Salancik, 2010).

The fundamental assumption of the RDP is that overall resources are limited, and the survival and prosperity of a given organization relies on input from other organizations. Organizations do not have sufficient resources to be independent and, therefore, must form coalitions to survive (Yuchtman & Seashore, 2007). This perspective explains why RDP considers organizations as coalitions of internal and external groups seeking mutual benefit. The more an organization depends on the limited resources from the external settings, the higher is its instability. Necessary resources, new technologies, accumulated expertise and experiences need to be integrated in order to overcome this instability. Consequently, the more it depends on the resources from the environment, the higher the rate of interactions between the organization and its environment. However, the environment does not bind organizations passively. Organizational systems should act proactively to manage the environmental conditions (Pfeffer & Nowak, 2006).

Information systems is itself critical resource for organizations. In case of the hospitals, the way information is coordinated, controlled, or disseminated is even more important because small changes can have profound effects on the inter-dependence relationships for all parties involved (Yuchtman & Seashore, 2007). The theory happens to be significant to the research since part of hospital management information systems depends on the resources available for implementation and ensuring the service quality of the system so as to ensure the system reliability. In essence, resource dependency will assist strategic managers have in place a good HMIS and good infrastructures within which the system components interact and

hence it was relevant in determining the effect of hospital management information system on the performance of health care institutions in Kenya.

General Literature Review

Hospital Management Information System Functionalities

Hospitals need information systems to allow them capture and disseminate information to decision makers for better coordination of healthcare at both the individual and population levels (Fichman, 2016). Comprehensive and precise HMIS is vital for several reasons. Patient details that are captured from various physicians, labs, clinics, and hospitals not only provide a complete understanding of the patient's healthiness past, but it also offers lots of evidence that can be used to increase patient's attention and results. For purposes of managing all the information that relates to the record of a patient and the inventory of the hospital, every hospital depends on HMIS functionalities (Wang, 2015). In the multi-specialty hospitals, a big number of patients visit or leave daily and that is quite challenging in maintaining all the patients records manually (Neuman, 2014). To cut down their load and managing hospital clinical, financial and administration aspects, smart HMIS is supposed to be considered (Hosoi, 2014).

Hospital management information system is a framework that hospitals utilize to gather and prepare all essential data through utilization of technology in the form of information systems so as to enhance the wellbeing and health of the patients through facilitation of the efficiency and effectiveness of the systems. This information can be exchanged between the units by means of the HIMS within the hospital IT department. It plays a coordinated role as it integrates all the key departments in the hospital so as to enable them function as one (Akkoc, 2009). HMIS is an institutional asset for the hospitals that has been used and expanded in quality concurring to

desires of the national health sector guidelines (Ozogul, Karsak, & Tolga, 2009). HMIS is key to hospital performance as it facilitates the maintenance of bulk information and data, which can also be easily retrieved when needed. The role played by HMIS requires that hospitals have sufficient staffs and personnel experts in different fields to facilitate the effectiveness and efficiency of the system (Saka, 2003). The system is essential in the hospitals as it facilitates the provision and delivery of information regarding patient care in a timely and a confidential manner. Thus there is need to provide the necessary resources to ensure that the system is effective so as its key role of enhancement and improvement of patient care is upheld (Yılmaz & Aloğlu, 2002).

The relevance of hospital management information system functionalities was measured in terms of HMIS quality. The quality of a system is the experience of a user on the system from an operational, design and technical perspective. That is mirrored in the evaluation of a user of the attributes of a system say convenience in usage, time taken to respond and reliability. The attributes are recognized as key to IT acceptance in healthcare in various contexts (Zuboff, 2015). Slow time for response and hardships using HMIS functionalities can end up in total discontent and lastly result to HMIS functionalities shutdown (Cohen & Coleman, 2016). Quality of the system is interested with the features of HMIS functionalities. Quality of the System which is prospectively contributed to incidents of safety of patients is described on the basis of reliability, usability, time for response and usability, compatibility (Salahuddin & Ismail, 2015). The essence of the system's quality, which assesses the system of processing data, and measures like consumer friendly, responsibility duration, reliability of the system, flexibility of the system, and usability are provided (Ghazisaeidi & Safdari, 2014).

The HMIS time for responses is deemed as a key feature to the quality of a system, which is concerned with time used by health IT towards responding accordingly (Salahuddin & Ismail, 2015). Quick time for response is important in the environment of healthcare for purposes of avoiding safety occurrences. Practitioners of Healthcare stated that applying HMIS tended to be consuming a lot of time because of the computers' slow speed or delays in network and slow procedures for the practitioners of healthcare to engage with those systems. Reliability of the system is linked with the quality of the system and alludes to the capacity of HMIS to constantly function effectively. Conversely, it is the level by which the functions of HMIS with no failure under the provided basic conditions in a given duration of time. Frequent malfunctioning of the system is linked to adverse reliability. Adverse reliability of the system ended in missing of data that was keyed in HMIS, delay of accessed information, and caused disruption the operation of the whole clinical department (Safdari & Ghazisaeidi, 2014). The operations that are to be incorporated entail the management of the medical record, pharmacy and procurement management.

Medical Record Management Functionality

This operation entails care for patients since it operates as a core information source for communication amongst providers of health care, handling the history of the patient, observing, diagnosing and the and therapeutic conclusions and a broad range of unstructured information and documents. This function is involved in capturing, storing, managing of transmitting information that relates to individuals' health or organizational activities working in the sector health. Convenience of entering data is where a patient table an acute episode, vitals and primary information of the patient must be entered rapidly in HMIS for enabling effective cooperation and following making of decisions (Cohen & Coleman, 2016). This operation enables patients to

have a look at their data on health. They have the capacity of accessing: information on appointment, medications, which they might be getting, and their results from the lab through internet (Jung & Padman, 2014).

Part of this function as well enables patients to enjoy active interactions with professionals of healthcare counting the physician and the pharmacist concerning their dosage refill needs and appointments scheduling (Fix, Stewart, & Mishuris, 2015). A patient has the capacity of accessing their history on health, appointments scheduling, messaging the doctor, viewing bills and paying their bills online. As well this function enables patients to be having general control on their treatment. The patients may employ their individual devices like tablet or phone, for creating and saving individual notes and receiving notifications and alerts from providers of healthcare (Ancker, Osorio, & Cheriff, 2015). Instead of waiting on phone in the course of working hours for purposes of setting appointment, the patiently just log in, view the availability of the doctor and schedule the period which is favourable for them both (Paan & Jung, 2014).

Laboratory Information Management Functionality

This functionality belongs to the category of the application software purposed for information management and storage during the laboratory work (Paszko & Turner, 2018). These systems are employed for controlling and managing reports, test outcomes, standards, instruments, laboratory personnel, samples and automation of workflow. Integrating the systems of laboratory information management with information systems of the management is going to facilitate prompt transmission of data required to land and administration of the enterprise. This function can provisionally be classified into these fundamental stages: The first one entails samples enrollment, which the laboratory has received. Sample enrolment might be carried out

either in automatic or manual mode, and for purposes of facilitating input of information this stage might be undertaken with application of certain relevant templates (Ileri, 2016).

The second stage includes sample assignment to analysis. A list is displayed by the system on every test, which may have been carried out according to the needs of standard documents and information regarding the material quantity for every test. The third stage involves proper analysis, which entails a host of actions and subjects. These entail sample preparation, performing measurements, counting the ones that engage samples use for controlling quality and information generation and gathering. The fourth entails input of outcomes of measurements in the model of laboratory information management (Belachew et al., 2018). Subsequent to implementation of sample analysis, the obtained results are keyed to the system in automatic or manual mode. The fifth stage entails inspecting outcomes and reports compilation. Operations for scanning the outcomes and approving them (validation and verification procedures) are supposed to be grounded on the model of laboratory information management. Operations for confirming authorization to make decisions, approving or rejecting test outcomes and indicators of quality are supposed to be adopted in the system (Ileri, 2016).

Procurement Management Functionality

The procurement management system functionality in hospitals remains a strategic and proactive function that needs a continuous improvement throughout each stage. It starts from the recognition of need to end with its fulfilment and by respecting essentially the five Rs of purchasing, which include; the right quality of product, at the right time in the correct quantity, from correct sources at correct prices, all that leading to increased efficiency as well as satisfaction of the patient (Yingkun, Zhang,

Shen, & Liu, 2016). This function is a joint term for various solutions on software, which use modern communication and information technologies particularly the mobile networks that may be used for automating external and internal processes linked with strategic purchasing and sourcing (Pestana, 2017).

Procurement management system functionality entails catalogue searching, requests on item requisition, approving, buying order, delivering, receiving, paying, identifying opportunities for sourcing, evaluation of supplier, negotiation and contract. This function focuses on hammering out uncertainties that are linked with systems of procurement that are manual. This function needs technologies that five aid for flexibility, integration and adaptability of applications of business for purposes of meeting rapid transformations in the environment of business. This function makes sure there exists an efficient and effective process for identifying possible material sources to be bought, monitoring existing partners or suppliers and evaluating their capacity before delivering the need products, and ensuring efficiency and effectiveness of the whole process of purchasing in the facility (Yingkun et al., 2016).

Pharmacy Management Functionality

The pharmacy management system functionality is linked directly with people's health, therefore it's quite difficult choosing an ideal method. Control of the inventory is supposed to be computerized and maintenance of every system to be done by the systems of a software like the System analyses and Data Processing (SAP) software. Input that is computerized is supposed to be fed in the SAP where drugs get inside or outside the inventory. Therefore, any person authorized can be involved in tracking a drug at any period and may get to see the amount of inventory that has left in a day (Davis et al., 2017). Systems that are analog are supposed to be withdrawn because they consume a lot of time and at times difficult finding out every data since chances

of losing the data are high. This functionality entails a digital system of keeping records for diagnostics, drug and the patients. Then, the pharmacist has the capacity of getting that information concerning their patterns on diagnostics and the disease. Pharmacists may do comparison of the drugs chosen and may undertake decision if correct or wrong. Through the system, there is a capability of reducing harmful impacts and also the prescription of the right medicine may be done easily (Saha et al., 2016).

It is quite a common thing in the health facilities that a certain patient receives treatment with a number of drugs. Often, the drugs are adjusted prior to the completion of the drugs for much better results. For instance, a physician gives a one-month drug prescription, but when one week is over the physician does a drug change for the patient for better alternative. Patients suffer since they already had purchased drugs for a month. To the patients, it is a monetary loss. Therefore, the system of returning drugs may be initiated. In that kind of system, a patient may do a drugs return that the physicians had described of that particular hospital and whether a particular criterion has been followed. For that, it is necessary to have drugs categorization grounded on the condition of storage. Drugs return does apply in cases where the condition of storage is not a big concern. Return is not supposed to apply for insulin, vaccine and injections etc. and the drugs, which do not have the date of expiry and the packet for dispensing (Brown et al., 2016).

Hospital Performance

Maatlin (2015) stated that the performance of a hospital can be described based on the accomplishment of defined targets, administrative or clinical. Importantly, healthcare purposes to provide good health though there exist various measures in

between of the outcome and the process. Targets might link to the functions of traditional hospital, like treatment, diagnosis, rehabilitation, care and also research and teaching. Nonetheless, both functions and description of health facilities are transforming, as pressure goes to ambulatory care, care of inpatient, networks of healthcare and community outreach programmes (Saarinen, 2014).

Murphy (2015) stated that health facilities require favourable incentives for providing complete, accurate and timely data to the exterior programmes of assessment. Where those programmes are believed to have a significant impact to the institution say, in motivation of personnel, team building; professional and clinical development or management of risk, hospitals do not have much necessity for market or financial incentives for participating (Vegoda, 2014). In other words, neither hospitals nor persons pay attention to providing information, that may result to blaming the public, litigation, losing staff, trade and authority. This research is going to be looking at 4 performance areas, which includes reduction of cost on healthcare, satisfaction of patients, efficient delivery of service and revenue growth.

Health Care Cost Reduction

Reduction of the cost on healthcare methods provide information for effectively controlling the healthcare costs and that is determined through affordability (Nicholson & Sahay, 2014). Affordability measures the capacity of certain consumer classes on paying for a certain service or good and is major in comprehending accessibility for care to populations that are underserved. Stakeholders tend to be keen on affordability since where services and products have price tags beyond individuals' reach, there is an unlikeliness of them becoming clients and hence no realization of health privileges. Where giving a look at services and products costs, it is significant

considering the client's expenditure (patient) and obtained revenues by the facility (Solt, 2015). In cases where the clients get services or products free of charge, there exists many cases where the facility is going to get zero revenues (the service or the product is offered free of charge) and for many cases where the facility will obtain funds from 3rd parties including the government and insurance (Huka, 2013).

Patient Satisfaction

Thompson and Sunol (2015) described satisfaction of a patient as the relationship interlinking perceived experiences, expectations and needs of a patient. It is deemed to be a major variable that affect health results, and majorly examined towards determining quality of care given. Having said that, there is no proper distinction between satisfaction of a patient and the perceptions of a patient on the health quality that they have obtained. Widely, it is agreed that assessing the satisfaction of a patient is an important tool towards determination of the delivery of healthcare and the healthcare quality given (Iddrisu, Mumuni, Ahmed, Mohammed, & Yahawa, 2019). In addition, it tables the weakness areas in the system of healthcare, and through that enables rectification to be done. Patients tend to be the major stakeholders across the wide ranging or complex field of contemporary medicine. There is a remarkable move from that which was deemed as passive receiver to the current active partaker since the services of health have become quite patient-centric (Atta-Mensah, 2016). That is then restated by Aduo-Adjei (2015) suggesting that to measure the satisfaction of a patient is quite a significant tool within the growing patterns on the way to accountability amongst the providers of healthcare, and general results in the equation of quality of care.

Patient Turn-around-time

Making sure that the services of health are available which meet the standard quality and guarantee accessibility to them tend to be major health system functions (WHO, 2017). The flow of patients mirrors the capacity of the system of healthcare to give service to the patients efficiently and quickly as they undergo through care stages. Blockage within that flow may escalate waiting and with time building an adverse impact on the standard of services delivered (Van den Berg et al., 2015). Where the flow of patients is properly handled, it is mirrored by short duration of waiting when registering, examining, diagnostic testing, pharmacy and discharging the patient (Belson, 2017). Therefore, enhancing the flow of patients is a means of enhancing services of healthcare. Wanyenze and Barrett (2019) various aspects can inspire efficiency and the occurrence of blockages in the operations of health care operations. These aspects entail the number of patients that are attended to every day, the kind of patients treated based on illness or care stages, clinic policies on how frequent a patient pays a visit, the provider that they are supposed to see, the composition and the size of providers and the model of staffing.

Growth in Revenue

Revenue growth is the increase (or decrease) in a company's sales from one period to the next (Alkins & Binka, 2015). This would be because of rise in prices of products and or vending many products. Growth of revenue because of increase in price would be because of adjustment in inflation and thus not because of actual growth in sales though if the costs continue to be low, it then results to actual sales growth. A rise in the volume of good sold as well mirrors the growth in sales, which would be because of a topographical expansion, development in fresh branches, or a rise in the volume of services and goods (Pop, Coldea & Gavrea, 2019). The revenues flow may impact not just how care for patients is administered but as well the hospital's health. The

volume of patients, their sources of insurance, the service type that are offered by a hospital and usage frequency of various services are only some several aspects that affect hospital expenses and revenues. As many health systems expand their portfolio of services stability of hospital-based net revenue becomes more important to financial decisions. With adoption of HMIS, there will be patient satisfaction and efficient service delivery, which will in turn increase the number of patient's being served and ultimately growth in revenue (Gutierrez & Nishtar, 2015).

Organization Culture

Magee (2012) stated that the culture of an organization is the combination of assumptions, which an organization's members hold onto. Mainly, these assumptions tend to be values and beliefs. Beliefs center on actuality and tend to arise from experience whereas values concern ideals, which are worth and desirable to strive for. It's the precise mix of principles, which are communal to everybody within a particular organization. As a result, this regulates the manner in which the individuals intermingle amongst themselves and those who are outsiders. Sharing the values and the beliefs establishes a culture for the business (Azhar, 2013). On the same note, Robbins (2012) described the culture of an organization as an organization's homogeneous acumen grounded on exceptional uniqueness that separates an organization from another.

The culture of an organization has a ubiquitous impact on any organization since it describes who its pertinent workers, competitors, suppliers and customers are, and the manner of interacting with those major actors (Barney, 2012). The strength or intensity of a culture, and the adaptiveness of that culture are the constituents enabling organizations satisfy the two demands of exterior flexibility and interior consistency (Schein, 2015). Where workers are knowledgeable of their company's culture, they

are going to be appreciative of the present and past operation system of the organization. This provides direction concerning the manner to conduct itself in days to come and as well promoting the culture of an organization through enhancement of mutual feelings. Thus, an organization which owns a culture that is properly stipulated mostly functions towards mutual goals and may accomplish efficiency since employees share ideals that are based on success (Wang, 2015). The culture of an organization assisted in determination of the restraining impact of HMIS on how the Nairobi Hospital performed.

Organization Leadership

Bass (2015) stated that leadership may be viewed as a set process, a personality attribute, the act of persuading compliance, exercising effect, a certain type of conduct, some kind of power relationship, persuasion a tool for achieving goals, the outcome of an engagement, a distinguished role or structure initiation. Creating outcomes in an environment that is changing and progressively competitive firms need quite a different leadership type based on studies done previously. With the globalization today and firms adopting with environments that are fast changing, leaders encounter a fresh reality. Operating in contexts that are flexible and with transformation in IT, progressively mobile workers have also become a major organizational resource (Reger, 2015). Presently, leaders must instantaneously be change agents and gravity centers keeping interior focus and enabling the organization and people to be effective and adapt, be focused on the customer and have an exterior viewpoint (Alimo-Metcalfe, 2014).

Leadership is a key role in management, which entails employees' motivation towards a joint objective. Leadership stresses followers' establishment and the demands of the followers. Managers using transformational styles of leadership pay focus on creating

an employees' value system, their moralities and level of motivation with their skills development (Ismail et al., 2017). Leadership has the capacity of directly stimulating businesses to achieve effectiveness (Alimo-Metcalf, 2014). Leaders establish culture, values, tolerance of change and motivation of employee. They model the plans of the organization counting their effectiveness and execution. Leaders undertake various roles at each level of an organization counting management. Leadership of an organization aided this study in determination of the impact of HMIS on how Nairobi Hospital performed.

Effect of Hospital Management Information System Functionality on Performance

Hospital management information system functionality in organizations of healthcare is supporting the processes of doing business, viable strategies as well as operation of business, that affect the workforce performance of the organization in specific (Ochieng, 2015). An organization's investment on HMIS functionality may aid it on central competencies, as well it aids in the process of production, records of human resource, monitoring and controlling different activities and financial records, that as a result impact on the development and growth of the organization and give sound grounds for tactical process of decision-making. Basu (2013) found that good application of the HMIS functionality in organizations of healthcare may aid in three ways; one includes management information system, worker's act, payroll systems or structure, monitoring and control of workers, and general activities of the organization.

The use of HMIS functionality enhances the performance of hospitals in that all data and information regarding the patient's bio data in the hospital is well recorded, maintained and its easily accessible and can be updated when required since the data

is stored in an electronic form. All hospital information is also easier to maintain as it is well taken care of by the computer system and this data is available when needed (Akbolat, 2018). HMIS has a lot of benefits since there is elimination of repetitiveness of some functions within the hospital as the functions are well integrated from one department to the other. All medical data can also be easily retrieved in the system and the information as kept as confidential as possible since only few authorized personnel have access to the data. Thus patient's privacy which is key to their satisfaction and hence hospital performance is maintained. The supply chain is also enhanced since there is easier request of purchases of drugs and other medical equipments when required (Ozyurt, 2009).

Kaynak (2013) stated that when hospital organization makes an investment in management information system or IT is not just an investment only but as well creates various opportunities types in that organization that impacts directly on the efficiency and performance of an employee and also the organization's profitability. One distinguished observation within Europe is every nation does have a distinguished method in its path to enable technologies within medical care. For example, France has developed the idea of hospitals that are digital through the technologies of telemedicine (Currie & Finnegan, 2013). Germany happens to be operating on an electronic health card which enables physicians to be checking the patient's administrative data and writing prescriptions on a system. Delone (2014) stated that the system is going to as well have volunteer medical operations for instance the record of emergency data and afterwards the electronic record of the patient which may be checked at anyplace by use of relevant card readers.

A study done by Chappell (2015) contended that HMIS functionality have allowed rapid processing, storing and transferring clinical information amongst the providers

of services in the developing nations. Melone (2013) stated that in incorporation of electronic health information technology (EHIT) has turned out to be a central part in the state medical care system of delivery. Dependence on EHIT looks composed to keep growing in the future as a result of the countless advantages gotten from capturing, storing, retrieving and analyzing big capacities of protected data on health, and from numerous sources, that's spread on a long duration. Alkins and Binka (2015) stated that among the various benefits of HMIS effectiveness, the role of work outcomes has been acknowledged.

Cohen and Coleman (2016), noted that hospital management information system enhances performance of hospitals through ensuring service quality. Dean, Mikic & Little (2006) described the quality of service as ways of telling how properly the level of service by clients fits their anticipations. Quality of service has been deemed as apprehensions with aid given by the providers of IT services on health. The model of quality of service shows that the perception of a consumer on quality are impacted by four distinct gaps happening in organizations. The loopholes on the side of providers of the services, that hinder services delivery, which consumers believe as being of great quality. They include differences amongst the expectations of patients and perception of management on the expectations of patients. Differences amongst the perception of the management and specification of quality of service. Differences amongst specification on quality of service and the delivered service in actual sense. Differences amongst delivery of service and that, which is communicated concerning the service to the clients (Jusoff & Rashid, 2009).

Empirical Literature Review

Cheruiyot (2019) focused on implementation of hospital management information systems on service delivery: a case of Moi Teaching and Referral Hospital. The

research employed cross sectional descriptive research design and analysed using Pearson correlation analysis and multiple regression analysis. The study concluded that the HMIS was a familiar system and that its implementation and utilization in the hospital was more pronounced in records and least in consulting doctor domains. The HMIS had made service delivery in all service points effective and timely provision of information at every stage was also an HMIS implementation force. The consultation module provided core clinical functionalities including patient triage, patient clerking, ward procedures, telemedicine, patient follow up and doctors' consultation. However, a gap exists as the above study focused on implementation of hospital management information systems whereas the extant study sought to focus on the effect of HMIS functionalities on the performance.

Kyalo and Otieno (2017) focused on the transformation of the health sector in Kenya by adopting integrated health management information system. A mixed method research design was adopted to determine the significance of the drivers identified in influencing the IHMIS. Both a semi-structured questionnaire and a key informant guide were used to collect data. The study concluded that operationalization of the management functions (planning, organizing, staffing, leading, controlling and coordination), leadership style adopted, technical factor (staff skills, availability of computers, internet connectivity, power, and system design) and behavioral factor of care providers and seekers were critical factors in the success of health management information system integration. Nonetheless, a gap exists as the above study focused on transformation of the health sector in Kenya by adopting integrated health management information system whereas the extant study sought to focus on the effect of HMIS functionalities on the performance.

While focusing on HMIS functionalities in the sector of health and Turkey's development, Demokaan (2018) employed empirical research where a desktop review was used with an aim of examining the types and developments of HMIS functionalities in the country of Turkey. It was noted that information system played a key role to produce, hare, store and transmit information within different fields. HMIS functionalities employed in the sector of health actively satisfied the necessities of patients, administrators and physicians in established processes. HMIS functionalities made sure that the correction of data was done in an interdependent, complete and correct way. HMIS functionalities development in the country of Turkey was grounded on HMIS functionalities project, which was aided by World Bank in year 1990 and carried out by the Health Ministry. Nevertheless, a gap exists as the above study focused on HMIS functionalities and did not address the issue of performance whereas the extant study sought to focus on the effect of HMIS functionalities on the performance.

Marete (2018) studied the impact of EMRS on how the services offered in a hospital are offered in the nation of Kenya, a perspective of operational efficiency. The research incorporated a descriptive design of research where correlational and descriptive analyses were employed. They concluded, EMRS usage resulted to enhanced delivery of services in the facility and enhanced efficiency of operations. Various impacts were discovered that resulted to efficiency of operations, they entail, proper support approach of decision for management of patient, faster accessibility of information of patients, decrease of time used in waiting for customers, enhancement of management of commodity and quicker lab outcomes observing for clinicians. Also it was discovered that the administrations of hospitals are supposed to work towards improving and leading EMRS usage ensuring that workers of healthcare are

given with management aid. They are supposed to be given training on EMRS, they are also supposed to have champions of EMRS at hospitals to strengthen training of EMRS and communication of the EMRS objectives through leading paper-less initiatives. However, a gap exists as the above study focused on the impact of EMRS on services offered whereas the present study sought to focus on the effect of HMIS functionalities on the performance.

Ambrose (2017) looked at performance of the electronic health record (EHR) within a healthcare amenity in a secondary in Nigeria. The research employed an explanatory case study method, collection of empirical material obtained from the doctors. The survey's findings showed that problems linked with EHRs execution in Nigeria's general hospitals entail infrastructure concerns like supply of power and insufficient equipment of ICT. Human aspects concerns like insufficient computer skills amongst non-clinical and non-medical personnel and political concerns like financial problems, corruption, poor administration were key hardships. Whereas the actors perceived that the doctor's willingness to incorporate the system of EHR and proper computer usage knowhow amongst doctors tended to potentials towards HER execution. The actors agreed, advantages like enhanced accessibility and improved safety and confidentiality of data for patients and improved delivery of service were obtained from executing EHR at the hospitals they served. However, a gap exists as the above study focused on performance of the electronic health record and was in the regional context whereas the existing study sought to focus on the effect of HMIS functionalities on the performance.

Tonnymuzaale and Ssekitooleko (2017) assessed aspects that influenced performance of HMIS functionalities in Uganda, a case for Lubaga hospital. A descriptive cross-sectional survey design was incorporated for this research. Triangulation was

incorporated in order to get data in questionnaire form as well as interview guide. They discovered that cultural aspects, strategic aspects and the tactical aspects affected the execution of HMIS functionalities scheme. They also discovered that HMIS functionalities execution had gone on to face various problems on its path to fulfilling its operation. That is mirrored based on cost increase, failure on commissioning other modules. Effectively executing HMIS functionalities can have a remarkable effect on a hospital, comparing to failure of the project can have a big adverse effect on every stakeholder. However, a gap exists as the above study focused on aspects that influenced performance of HMIS functionalities and was in the regional context whereas the current study sought to focus on the effect of HMIS functionalities on the performance.

While focusing on the use of routine health information for decision making among health workers at coast general hospital, Mombasa County, Kenya, Mboro (2017) used a descriptive cross-sectional research design. Self-administered questionnaire, key informant interview guide and focus group discussion guide were tools used to collect data. Quantitative data was analyzed using Statistical Package for Social Science (SPSS) version 20 and qualitative using QSR international NVivo11. It was noted that poor access to functional equipment's like computer and internet jeopardized routine health information utilization. There were concerns about poor data quality in terms of inaccurate, untimely, incomplete and unreliable data. The results also highlighted low staff morale as an obstacle to use of health information that was attributed to the poor data quality and network problems. Nevertheless, a gap exists as the above study focused on health information for decision making among health workers whereas the present study focused on the effect of HMIS functionalities on the performance.

While focusing on establishing a well-functional computerized health management information system in Mbagathi County Hospital, Kenya, Kyalo and Otieno (2017) a descriptive case study research design was conducted in the month of August 2015. Questionnaires were used to collect data and was analyzed using descriptive statistics and multiple regression analysis. The study concluded that Medboss as an HMIS functionality was designed to collect both administrative and clinical data for purposes of effective and efficient decision making as well as planning for the hospital. However, the hospital had not implemented all the functionalities such as bed management, nursing, human resource management and drug management. Findings also indicated that Mbagathi County hospital lacked policy documents that guide successful implementation of the system. Inadequate ICT infrastructure, in terms of power, connectivity, backups, storage leading to hanging or slow operation on the system and missing data fields were also identified as constrains of utilisation of the system. Nevertheless, a gap exists as the above study focused on computerized health management information system whereas the present study focused on the effect of HMIS functionalities on the performance.

Saeed, Fereshteh and Abbas (2016), while investigating on the status of implementation of HMIS functionalities in Khorasan Razavi Hospitals in Iran, used a descriptive survey design where collection of data was in form of questionnaires. For purposes of analyzing data the t-test and ANOVA were employed. They discovered the standards of HMIS functionalities were appropriate in Khorasan Razavi hospitals, nonetheless, their usage needed increased hospitals' efforts. Standards execution and actualization in the hospital needed increased hospitals' efforts. Standards execution and their actualization within hospitals needed definite infrastructures like proper knowledge for managers concerning tools and principles of enhancement of quality,

training staff on those standards, execution of models of management of quality and excellence of the organization, strengthening the hospital's public affairs and employing HMIS functionalities all this impacted on the realization process for quality enhancement standards and the safety of patients. However, a gap exists as the above study focused on the status of implementation of HMIS functionalities and was in the global context whereas the present study focused on the effect of HMIS functionalities on the performance.

Najem (2016) studied the impact of HMIS functionalities quality on quality of health care in European Gaza Hospital in Palestine. A descriptive analytical and survey method was employed where questionnaires were applied. Correlation and regression analysis were also used as forms of analysis. The research discovered that there existed a noteworthy relation amongst the dependent and independent variables (quality of performance, quality of information and quality of service). As well, it was discovered there was a positive relation significant statistically between the hospital information system quality and patient's quality of healthcare. The outcomes showed that, quality of HIS did have a positive substantial impact on healthcare quality. The study outcomes indicated that a need for increasing awareness existed on advantages of information system towards enhancing training on HIS fields and developing HIS selection multidisciplinary staff. However, a gap exists as the above study focused on the impact of HMIS functionalities quality on quality of health care and was in the global context whereas the present study focused on the effect of HMIS functionalities on the performance.

Gacheri (2015) looked at the usage of HMIS functionalities amongst the healthcare personnel at Mater and Kenyatta National Hospitals in the nation of Kenya. Descriptive research design was used entailing qualitative and quantitative methods

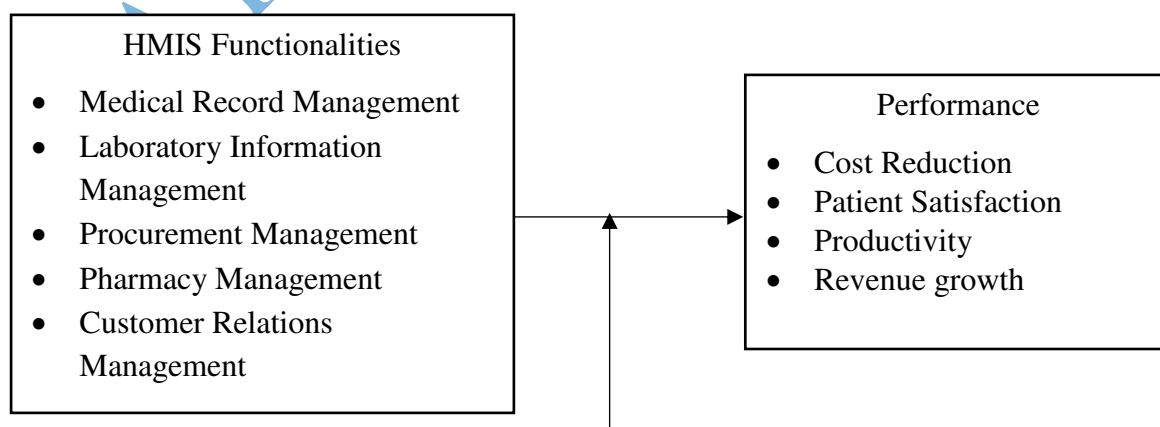
in which a structured questionnaire was employed for purposes of gathering data. The author discovered that HMIS functionalities handle quality of data and is featured by data completeness, accuracy, timeliness and relevance whereas the performance of health system focuses explicitly on makers of decisions keeping into consideration information on management, delivery of service, planning and policymaking. The study findings showed the two hospitals coincided HMIS functionalities gave relevant and accurate information of a patient and other relevant data required for effective management of care for patients and proper governing the facility of health. However, a gap exists as the above study focused on HMIS functionalities amongst the healthcare personnel whereas the present study focused on the effect of HMIS functionalities on the performance.

Conceptual Framework

A conceptual framework is an analytical tool that diagrammatically portrays the relationship between the research variables. It shows mainly the relationship between independent variables and dependent variable while it may also show the link between the moderating variables (Kumar 2011).

Independent Variable

Dependent Variable



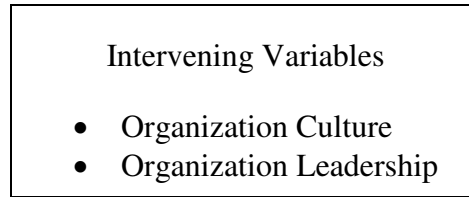


Figure 2.1: Conceptual Framework

Source: Author (2020)

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Summary

In summary, this chapter covered four theories of hospital management information system on the performance. DeLone and McLean's model identified six interdependent variables used to measure information systems success, namely; system quality, information quality, service quality, use or intention to use, user satisfaction, and net benefit. Theory of the innovative firm indicates that a firm's function includes transforming resources that are productive into services and goods which may be commercialized. Technology Acceptance Model contends that the acceptance of individuals to the fresh technology is measured by two technology perceptions; apparent usefulness and the apparent convenience of usage. The Resource Dependence Perspective is that overall resources are limited, and the survival and prosperity of a given organization relies on input from other organizations. The study as well took care of empirical and general literature from a number of studies. At last, conceptual framework was done that illustrated the relationship amongst independent variables, intervening variable and the dependent variable.

CHAPTER THREE

RESEARCH METHODOLOGY

Introduction

Research methodology refers to the study of the general approach to inquiry in a given field. It focuses on the process of developing information and knowledge in a study (Ethridge, 2004). This chapter presents the research design, location of the study, target population, sampling techniques, data collection methods, data collection procedures and data analysis. Ethical considerations applicable to the study were also outlined.

Research Design

As per Kothari (2014) research design is a roadmap, a plan and a draft strategy of the conceived investigation for purposes of obtaining solutions to questions under research. The purpose of a research design is to provide a plan of study that permits accurate assessment of cause and effect relationships between independent and dependent variables (Saunders, Lewis & Thornhill, 2012). There are three major research design types, which involve; exploratory, explanatory and descriptive design (Saunders, Lewis, & Thornhill, 2012). Exploratory research design focuses on exploring the questions under research and its intention is not to provide conclusive and final answers to the problems at hand. The primary purpose of explanatory research is to explain why phenomena occur and to predict future occurrences. Descriptive research is applied in describing a population's features under research (Kothari, 2014). Research design help to describe the data, which were necessary for an adequate test of the hypotheses and

explain how such data was obtained and analyzed for the purpose of achieving the objective of the study (Kothari, 2014).

The present study used descriptive research design. Kothari (2014) explained that descriptive research is used in a study, which is concerned with describing the characteristics of a particular individual, or of a group. The design is appropriate because the study aims to determine the effect of hospital management information system on the performance of the Nairobi hospital. The design is applicable in the study because it enabled the study to determine the effect of hospital management information system on the performance.

Population

Population refers to a full set of objects, cases or individuals that have some similar observable features (Mugenda & Mugenda, 2008). As well, Kombo and Tromp (2006) stated that a population alludes to a properly defined group of things, events, households, people, elements and services under investigation for generalizing outcomes. In statistics, a population is an entire group about which some information is required to be ascertained (Kwese, 2013). The total population at the Nairobi Hospital is 1,800 staff members (Nairobi Hospital Human Resource, 2019).

Target Population

Target population alludes to the whole group or a person, objects or events with common observable characteristics (Mugenda & Mugenda, 2003). The population targeted by this study was 1,200 staff members that were from the following categories: Management; Finance Team; Procurement Team; ICT Department, Doctors; Nurses; Laboratory Department; Radiology Department and Medical Records Team. The reason for these categories is that they work with the Hospital

management information systems and they have sufficient information on the HMIS in the hospital as well as the level of performance after HMIS, which helped in addressing the research objectives.

Table 3.1: Target Population

Target Population	Population Frequency
Management	40
Finance Team	100
Procurement Team	20
ICT Department	20
Doctors	150
Nurses	700
Laboratory Department	110
Pharmacy Department	30
Medical Records Team	30
Total	1,200

Source: The Nairobi Hospital Human Resource (2019)

Sample Size

A sample is the number of units or persons that are chosen from which data was gathered (Mugenda & Mugenda, 2012). For descriptive research above 10% of the overall population is adequate and a higher sample size gives more reliability (Mugenda, 2008) and, thus, from the population a sample of 120 staff members were obtained. From each stratum the study selected 10% of the overall population to achieve the 120 staff members as the sample size as shown in Table 3.2.

Table 3.2: Sample Size

Target Population	Target Population	Sample Size (10%)
Management	40	4
Finance Team	100	10
Procurement Team	20	2
ICT Department	20	2
Doctors	150	15
Nurses	700	70
Laboratory Department	110	11
Pharmacy Department	30	3
Medical Records Team	30	3
Total	1,200	120

Source: The Nairobi Hospital Human Resource (2019)

Sampling Techniques

Sampling design is defined as a formation or a blueprint that helps in determining the sample size for a given examination (Derrickson, 2015). Sample frame for this study was carefully selected to form a representative of the whole population with the relevant characteristics. The researcher utilized a stratified random sampling strategy since the study population is not homogenous and, in this way, it is conceivable to isolate this population into strata to induce a representative sample. Kothari (2014) pointed out that stratified random sampling methods is preferred as it is able to give an estimate of the population under study with better precision and provides a sample that is more representative of the population.

Data Collection Instruments

There exist various approaches of gathering primary data particularly in descriptive studies. These includes observation, interview, and questionnaires among others. The present research employed a questionnaire being the main instrument for primary collection of data. This is as per another examination done by Newton (2015) which found that questionnaires give a more noticeable opinion afterward inspiring open responses to fragile questions and is not biased, promising accuracy and significant data. In addition, a questionnaire is going to be suitable for this examination considering that the researcher can accumulate information from a greater sample size.

Data Collection Procedure

The questionnaire was designed in a manner that it contained open and close ended questions to bring out definite replies for qualitative and quantitative examinations. A

bit of the closed ended questions required an answer on a 4-point Likert scale, demonstrating to what degree each independent variable effect HMIS on the performance of Nairobi hospital. Furthermore, the questionnaire is to be prepared in two subsections. The first one inquired on demographic features like; sex, age, and tenure at the Nairobi hospital. The second section had questions from the three specific objectives.

Pretesting

To ensure constancy and consistency of the instrument of research, a pre-test was coordinated using a subjective sample of ten persons from the Nairobi Women's Hospital (NWH). The motivation behind selecting NWH is because, the healthcare facility were then undergoing transition due to expansion and hence calling for a new strategy to enhance information management and overall hospital administration. In addition, NWH had the same HMIS as the one implemented in the Nairobi Hospital. 10 persons for the pretest were picked in perspective of Kathuri and Pals' (2013) proposal that it is the most unobtrusive number, which generates essential results in data analysis in any research. Moreover, Sekeran (2013) found that a pretest is central for testing the legitimacy and unwavering quality of data gathering instruments. In this study, pretest aimed at assessing the sensibility of study questions, the interview time, the questions' wording and responses' consistency.

Validity and Reliability of Data Collection Instruments

Validity deals with precision of study answers to the study question or the strength of the study conclusions. There exist three validity types, which are; face validity, content validity, and construct validity. In validity testing, one needs to find out whether the set of questions asked amply address the study objectives (Erik & Marko, 2011). For data validity purposes, this study applied face validity.

This was done by asking participants to give suggestions regarding the nature of the questions in relation to the specific objectives. Construct and content validity are to be employed for purposes of evaluating inferences grounded on the outcomes from the instrument of research. Therefore, for purposes of establishing construct and content validity, an opinion from an expert was sought.

Reliability alludes to the measure of if or if not one gets a similar answer through the use of an instrument for measuring a thing more than one time (Bryman & Bell, 2015). Simply, reliability of a research is the level by which a method used in research gives consistent and stable outcomes. A specific measure is considered to be reliable if its application on the same object of measurement number of times produces the same results (Bryman & Bell, 2015). The test retest method was used to test the reliability of the research instruments.

Data Analysis Plan

Analysis of data entails giving sense to the collected data (Gliner & Morgan, 2000). Both descriptive and inferential data analysis were used in this study. The raw data obtained from the study area is hard to be interpreted hence the data must undergo cleaning, coding, and keying into the computer for analysis (Mugenda & Mugenda, 2008). There was collection, tabulation and analysis of the data, to ensure clarity where the SPSS software version 22 was used. This is a program in the computer applied for analyzing and has a capacity for handling the statistical presentation with group of formulas in order to interpret easily. The researcher conducted a Pearson correlation analysis to determine the strength of the relationship between the independent variables and the dependent variable. Pearson correlation analysis is the statistical tool, which was employed towards determining

the association level of the independent variables and dependent variable (Cooper & Schindler, 2011). Presentation of this data was through the deployment of tables.

Ethical Considerations

Ethics entails studying the right and wrong behavior (Dooley, 2007). The study ensured confidentiality of the participant's information. Research permission was pursued from the appropriate authorities before actual data collection commenced. Such authorities included; the permission from the National Commission for Science, Technology and Innovation (NACOSTI) and the Nairobi Hospital Management.

The study clearly informed the respondents of the purpose of the study and gave them a written assurance that the collected data was only for academic purposes and utmost confidentiality was heeded to. For purposes of increasing the confidence levels amongst participants, no individual details of identification were needed for the questionnaire's purposes. Permission from the participants was as well sought. The data sources as well as more information for literature review were effectively acknowledged in this research. Mugenda and Mugenda (2003) pointed out that it is a must for a researcher to check the voluntary consent principle in which the participants by they own engaged in the study. Well-versed consent was supposed to be ground on information concerning: the research' purpose, researcher's identification, any advantages which might be obtained.

Summary

This chapter has outlined the technics and methods to undertake the study. The research applied descriptive research design whereby a questionnaire was the key method of data collection. Pretesting was undertaken before the main study commenced to determine the validity and reliability of the research instruments. Both

descriptive and inferential data analyses were conducted. The next chapter presents the study findings, the analysis, and the interpretation.

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CHAPTER FOUR

DATA PRESENTATION, ANALYSIS, AND INTERPRETATION

Introduction

This chapter presents the analysis, presentation and interpretation of data acquired from the field with an aim of achieving the objectives of the study.

Analysis and Interpretation

Response Rate

The targeted sample size for this study was 120 employees working at the Nairobi Hospital, consisting of management employees at the senior level, middle level as well as the non-management employees. The study response rate was as presented in Table 4.1.

Table 4.1: Response Rate

Category	Frequency	%
Responded	92	76.7
Did not respond	28	23
Total	120	100

In Table 4.1, out of the 120 questionnaires that were administered, 92 of them were returned duly which translated to a response rate of 76.7%. This implies that the response rate of 76.7% was satisfactory and good for analysis, drawing conclusions and making inferences. Mugenda and Mugenda (2012) maintained that for a response rate to be satisfactory it has to be 50% and the chance it comes to 70% is good enough.

Background Information

Gender of the Respondents

The study sought to determine the gender of the respondents. Table 4.2 presents the study findings.

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Table 4.2: Gender of the Respondents

Gender	Frequency	%
Female	52	56.5
Male	40	43.5
Total	92	100

Table 4.2 show that 52(56.5%) of the respondents were female while 40(43.5%) of the respondents were male. These findings depict that most of the respondents in this research were female. However, the proportion of male respondents was also relatively significant owing to the fact that the ratio of female to male respondents were close to 1:1.

Age Bracket of the Respondents

The study sought to examine the age bracket of the respondents. Table 4.3 presents the results.

Table 4.3: Age Brackets of the Respondents

Age bracket	Frequency	%
20 to 30 years	24	26.1
31 to 40 years	28	30.4
41 to 50 years	16	17.4
Above 51 years	24	26.1
Total	92	100.0

According to Table 4.3, there were 28(30.4%) respondents who were 31-40 years old, followed by 24(26.1%) who were aged between 20 to 30 years or above 51 years while 16 (17.4%) respondents were aged between 41 to 50 years. These results infer that the Nairobi Hospital had diverse staff population with majority being between 20 and 50 years. Kithaka (2014) maintained that age is a key factor to be observed while undertaking a study so as to ensure that all people across the age brackets are used in the study and thus the representativeness of all people is used in the study.

Respondents' Work Department

This section highlighted the department of work that participants worked with and the results were as presented in the Table 4.4.

Table 4.4: Respondents' Work Department

Department	Frequency	%
Management Department	2	2.2
Finance Department	4	4.3
Procurement Department	2	2.2
ICT Department	2	2.2
Doctor's Department	11	12.0
Nursing Department	59	64.1
Laboratory Department	8	8.7
Pharmacy Department	2	2.2
Medical Records Department	2	2.2
Total	92	100.0

According to Table 4.4, the results show that 2(2.2%) respondents were from the management department, 4(4.3%) were from finance department, 2(2.2%) were from procurement, and 2(2.2%) were from ICT department. Further, 11(12%) were from doctor's department, 59(64.1%) were from nursing department, 8(8.7%) were from laboratory department, 2(2.2%) were from pharmacy and medical records department. It is, thus, clear from these findings that most participants were drawn from the nursing department. This further depicts fair response since the Nairobi Hospital population is made up of more nurses compared to other employees.

Position in the Organization

The participants were asked to indicate the position they held in the Nairobi Hospital and the results were as per Table 4.5.

Table 4.5: Position in the Organization

Position	Frequency	%
Managers	2	2.2
Finance officer	4	4.3
Procurement officer	2	2.2
ICT officer	2	2.2
Doctor	11	12.0
Nurse	59	64.1
Lab technician	8	8.7
Pharmacists	2	2.2
Medical records officers	2	2.2
Total	92	100.0

The study revealed that the respondents held various positions. It was noted that 2(2.2%) of the respondents were managers, 2(2.2%) were procurement officers, 2(2.2%) were ICT offices, 2(2.2%) were pharmacists, and 2(2.2%) were medical records officers. Further, 4(4.3%) of the respondents were finance officers, 11(12%) were doctors, 59(64.1%) were nurses, while 8(8.7%) were lab technicians. It is, thus, clear from the above that most participants were nurses. This further depicts fair response based on targeting procedures adopted by this study in that the Hospital population is made up of more nurses compared to other employees.

Period of Service

Participants were required to indicate the period, which they had served in the organization. Table 4.6 presents the findings.

Table 4.6: Period of Service

	Frequency	%
0-5 years	20	21.7
6-10 years	36	39.1
Above 11 and years	36	39.1
Total	92	100

As shown in the Table 4.6, most of the respondents at 36(39.1%) had served for more than 11 years, another 36(39.1%) had served for a period of 6-10 years, while 20(21.7%) had served for not more than 5 years. Based on their vast experience with most of the participants, it is evident that they were in a better position to give credible information relating to this study subject.

Hospital Management Information Systems Functionalities

The study sought to determine the extent to which HMIS functionalities had been implemented. In particular, the study included the medical record management functionality, laboratory information management functionality, procurement management functionality, pharmacy management functionality, doctor/nursing functionality, management/MIS reporting functionality.

Medical Record Management Functionality

On medical record management functionality, the participants were asked to indicate the extent in which it had been implemented and the results are presented in Table 4.7.

Table 4.7 Medical Record Management Functionality

	Frequency	%
Partially	0	0.0
Fully	2	2.2
Not sure	90	97.8
Total	92	100.0

Results presented in Table 4.7 show that most of the participants 90(97.8%) were not sure whether the medical record management functionality had been implemented, 2(2.2%) respondents indicated that the functionality had been fully implemented while none indicated that the functionality had been partially implemented. Lack of awareness by 90(97.8%) demonstrates lack of system integration between

departments thus making it difficult for employees to comment on other departmental way of operations. According to Demokaaan (2018), digitizing patient records and adopting a document management system Improves efficiencies and lower health care costs by promoting preventative medicine and improved coordination of health care services, as well as by reducing waste and redundant tests.

Laboratory Information Management Functionality

The respondents were required to indicate the extent in which the laboratory information management functionality had been implemented in the hospital and the results are presented in Table 4.8.

Table 4.8: Laboratory Information Management Functionality

	Frequency	%
Partially	2	2.2
Fully	6	6.5
Not sure	84	91.3
Total	92	100

Results presented in Table 4.8 showed that most of the participants at 84(91.3%) were not sure whether the laboratory information management functionality had been implemented, 6(6.5%) indicated that the functionality had been fully implemented, while 2(2.2%) indicated that the functionality had been partially implemented. Drawing from the above evidence, the laboratory information management functionality had not been fully implemented and integrated in all the departments in the hospital. Lack of awareness by 84 (91.3%) demonstrates lack of system integration between departments thus making it difficult for employees to comment on other departmental way of operations. These findings support the contention by Alimo-Metcalf (2014) that electronic health records eliminate the need to store documents in bulky file cabinets, which frees up more space in the office for medical supplies and equipment and other essentials.

Procurement Management Functionality

The respondents were required to indicate the extent in which procurement management functionality had been implemented in the hospital and the results are presented in Table 4.9.

Table 4.9: Procurement Management Functionality

	Frequency	%
Partially	0	0.0
Fully	2	2.2
Not sure	90	97.8
Total	92	100.0

From Table 4.9, most of the participants 90(97.8%) were not sure whether the procurement management functionality had been implemented, 2(2.2%) respondents indicated that the functionality had been fully implemented while none indicated that the functionality had been partially implemented. Drawing from the above evidence, the procurement management functionality had not been fully implemented and integrated in all the departments in the hospital. Lack of awareness by 90(97.8%) respondents demonstrates lack of system integration between departments thus making it difficult for employees to comment on other departmental way of operations, according to Bajwa (2013), procurement technology allows for electronic document storage, which simplifies a number of processes.

Pharmacy Management Functionality

On the extent that the pharmacy management functionality had been implemented, the results were as per Table 4.10.

Table 4.10: Pharmacy Management Functionality

	Frequency	%
Partially	18	19.6
Fully	29	31.5
Not sure	45	48.9
Total	92	100

Results presented in Table 4.10 indicated that 45(48.9%) of the respondents were not sure whether the pharmacy management functionality had been implemented, 29(31.5%) respondents indicated that the functionality had been fully implemented, while 18(19.6%) indicated that the functionality had been partially implemented. Drawing from the above evidence, most of the respondents were not sure whether the pharmacy management functionality had been fully implemented, which indicates that the system has not been integrated with all other departments in the Hospital. According to Saarinen (2014), processing medical records electronically allows healthcare facilities to move faster and function more efficiently, reducing administrative costs.

Doctor/Nursing Functionality

The participants were requested to indicate the extent in which the Doctor/Nursing management functionality had been implemented in the hospital and the results are as per Table 4.11.

Table 4.11: Doctor/Nursing Functionality

	Frequency	%
Partially	38	41.3
Fully	32	34.8
Not sure	22	23.9
Total	92	100

Results presented in Table 4.11 showed that majority of the participants 38 (41.3%) indicated that the facility had partially implemented doctor/nursing functionality, 32(34.8%) of the participants indicated that the functionality had been fully implemented while 22 (23.9%) could not clarify on the current status. Drawing from the above evidence, the doctor/nursing functionality had been partially implemented

and hence the need to fully implement and integrate it in all the departments in the hospital.

Management/MIS Reporting Functionality

On the extent that management/MIS reporting functionality had been integrated the results are as per the Table 4.12.

Table 4.12: Management/MIS Reporting Functionality

	Frequency	%
Partially	13	14.1
Fully	18	19.6
Not sure	61	66.3
Total	92	100

Results presented in Table 4.12 indicated that 61(66.3%) of the respondents were not sure whether the management/MIS reporting functionality had been implemented, 18(19.6%) respondents indicated that the functionality had been fully implemented, while 13(14.1%) indicated that the functionality had been partially implemented. These findings imply that the management/MIS reporting functionality had not been fully implemented and integrated with all the other departments in the hospital.

Statements Relating to Hospital Management Information Functionalities

Participants were required to indicate their level of agreement with statements regarding hospital management information. Table 4.13 presents the results.

Table 4.13: Statements Relating to Hospital Management Functionalities

Statement	Strongly disagree		Disagree		Agree		Strongly agree		Mean	Std Dev
	F	%	F	%	F	%	F	%		
The HMIS functions provide accurate information about the patients at the hospital.	0	0	16	17.4	48	52.2	28	30.4	3.00	0.84
The HMIS functions provide up-to-date, information about the patients at the hospital.	0	0	16	17.4	48	52.2	28	30.4	3.13	0.68
The HMIS functions facilitate better coordination of the healthcare services at the hospital.	4	4.3	12	13.0	48	52.2	28	30.4	3.09	0.78
The HMIS functions have enabled provision of feedback on patient care at the hospital.	4	4.3	16	17.4	44	47.8	28	30.4	3.04	0.81
The HMIS functions at the hospital are of high quality.	16	17.4	20	21.7	36	39.1	20	21.7	2.65	1.01
The HMIS functions at the hospital are user friendly.	4	4.3	36	39.1	36	39.1	16	17.4	2.70	0.81
The HMIS functions at the hospital are responsive to user requirements.	4	4.3	32	34.8	48	52.2	8	8.7	2.65	0.70
The HMIS functionalities at the hospital are reliable.	4	4.3	32	34.8	48	52.2	8	8.7	2.65	0.70

According to Table 4.13, it was noted that 48(52.2%) of the respondents agreed that HMIS functions provided up-to-date information about the patients at the hospital, 28(30.4%) strongly agreed to the statement, while 16(17.4%) disagreed with the statement. The overall mean recorded at 3.13 with a low standard deviation of 0.68. This implies that majority of the respondents agreed that HMIS functions provided up-to-date, information about the patients at the hospital. These findings concur with observations made by Fichman (2016) that HMIS provides feedbacks on patient care processes for hospitals.

The results also showed that 48(52.2%) respondents agreed that HMIS functions facilitated better coordination of the healthcare services at the hospital, 28(30.4%) strongly agreed to the statement, 12(13.0%) disagreed with the statement, while 4(4.3%) strongly disagreed with the statement. The overall mean recorded at 3.09 with a low standard deviation of 0.78, which implies that the respondents generally agreed that HMIS functions facilitated better coordination of the healthcare services at the hospital. These findings support the study findings by Ylmaz and Aloglu (2002) that HMIS helps to give medical personnel instant access to reports and timely treatment decisions are made.

Further, the results disclosed that 44(47.8%) respondents agreed that the HMIS functions had enabled provision of feedback on patient care at the hospital. 28(30.4%) strongly agreed to the statement, 16(17.4%) disagreed with the statement while 4 (4.3%) strongly disagreed with the statement. The overall mean recorded at 3.04 with a low standard deviation of 0.81, an indication that the respondents generally agreed that the HMIS functions had enabled provision of feedback on patient care at the hospital. These findings go hand in hand with contention by Safdari and Ghazisaeidi (2014) because processes on HMIS are automated and a lot of tasks are assigned to the software to be performed with utmost accuracy, with minimum human intervention, the scope of error is reduced dramatically.

The findings revealed that 48(52.2%) respondents agreed that HMIS functions provided accurate information about the patients at the hospital. Further, 28(30.4%) strongly agreed to the statement, while 16(17.4%) strongly disagreed with the statement. The overall mean recorded at 3.00 with a low standard deviation of 0.84; this implies that majority agreed that that HMIS functions provided accurate

information about the patients at the hospital. These findings go hand in hand with study findings by Ismail and Salahuddin (2015) that HMIS timeframe for responses is a key feature that enable health officers to respond accordingly.

The study findings revealed that 36(39.1%) respondents either agreed or disagreed that HMIS functions at the hospital were user friendly. Further, 16(17.4%) strongly agreed to the statement, while 4(4.3%) strongly disagreed with the statement, The overall mean recorded at 2.70 with a low standard deviation of 0.81; which implies that the respondents generally agreed HMIS functions at the hospital were user friendly. These findings support the study findings by Zuboff (2015) which found that HMIS is simple to understand and allows every task to be traced to the employee who performed it.

Further assessment revealed that 48(52.2%) respondents agreed that HMIS functionalities at the hospital were reliable, 32(34.8%) disagreed, 8(8.7%) strongly agreed, while 4 (4.3%) respondents strongly disagreed with the statement. The overall mean recorded at 2.65 with a low standard deviation of 0.70, which implies that majority of the respondents generally agreed that HMIS functionalities at the hospital were reliable. These findings concur with study findings by Yilmaz and Aloğlu, (2002) who noted that HMIS gives the kind of accountability that manual processes never manage to give.

The findings also revealed that 48(52.2%) respondents agreed that HMIS functions at the hospital were responsive to user requirements, 32(34.8%) disagreed, 8(8.7%) strongly agreed, while 4(4.3%) strongly disagreed with the statement. The overall mean recorded at 2.65 with a low standard deviation of 0.70; which implies that the respondents generally agreed that HMIS functions at the hospital were responsive to

user requirements. These findings support the study findings by Zuboff (2015) that HMIS is simple to understand and allows every task to be traced to the employee who performed it.

It was revealed that 36(39.1%) respondents agreed that HMIS functions at the hospital were of high quality, 20(21.7%) strongly agreed, 20(21.7%) disagreed, 16(17.4%) strongly disagreed with the statement. The overall mean recorded at 2.65 with a high standard deviation of 1.01, which implies that averagely the respondents agreed that HMIS functions at the hospital were of high quality. These findings support the study findings by Safdari and Ghazisaeidi (2014) which showed that HMIS cuts out a lot of manual work that are performed in hospitals especially documentation and record keeping.

The Nairobi Hospital Performance

Descriptive reports from the participants revealed that HMIS had inter-linked departments to work together, which is an improvement, the hospital over time improved in the quality of services being offered and the systems being used. Further, the study noted that there is drastic improvement in the hospital performance as there has been expansion of hospital facilities and infrastructure and even more so in ICT and that the hospital performance has improved with time at the registration desk, doctor's module has improved and the triage process has improved.

Participants were required to indicate their level of agreement with the following statements regarding hospital performance. Table 4.14 presents the study findings.

Table 4.14: Statements Relating To Hospital Performance

Statement	Strongly disagree		Disagree		Agree		Strongly agree		Mean	Std Dev
	F	%	F	%	F	%	F	%		
The Hospital has over the years achieved growth in revenue from the services it offers.	4	4.3	0	0	64	69.6	24	26.1	3.17	0.64
The Hospital has over the years improved its productivity from the services/procedures undertaken at the Hospital.	4	4.3	0	0	52	56.5	36	39.1	3.30	0.69
The Hospital has had an improvement in patient satisfaction with the services offered at the Hospital over the years.	4	4.3	12	13.0	60	65.2	16	17.4	2.96	0.69
There has been an increase in the number of patients seeking medical services at the Hospital	0	0	12	13.0	52	56.5	28	30.4	3.17	0.64
There has been improvement in the level of patient care at the Hospital over the years	0	0	12	13.0	48	52.2	32	34.8	3.22	0.66
There has been improvement in the processes and turnaround time at the Hospital over the years	4	4.3	32	34.8	44	47.8	12	13.0	2.70	0.75
There has been better and efficient delivery of the services offered at the Hospital over the years	0	0	24	26.1	56	60.9	12	13.0	2.87	0.62
There has been improved work coordination and teamwork at the Hospital over the years	8	8.7	16	17.4	44	47.8	24	26.1	2.91	0.89
Staff morale has improved over the years	16	17.4	16	17.4	52	56.5	8	8.7	2.57	0.88
Patient and staff safety has improved over the years	8	8.7	12	13.0	64	69.6	8	8.7	2.78	0.72

The findings shown in Table 4.14 show that 52(56.5%) respondents agreed that the Nairobi Hospital had over the years improved its productivity from the services/procedures undertaken at the hospital, 36(39.1%) strongly agreed, while 4(4.3%) strongly disagreed with the statement. The overall mean recorded at 3.30

with a low standard deviation of 0.69, meaning that the respondents generally agreed that the Hospital had over the years improved its productivity from the services/procedures undertaken at the Hospital. These findings support the study findings by Maatlin (2015) that HMIS should enhance effectiveness since units can communicate directly to the respective departments by just a click on the system.

The results further show that 48(52.2%) respondents agreed that there had been improvement in the level of patient care at the hospital over the years, 32(34.8%) strongly agreed, while 12(13.0%) disagreed with the statement. The overall mean recorded at 3.22 with a low standard deviation of 0.66, an indication that respondents generally agreed that there had been improvement in the level of patient care at the Hospital over the years. These findings confirm the assertion by Murphy (2015) that HMIS should enhance procurement of materials to be used in the hospital for example the processing of LPOs and the tendering process.

Table 4.14 show that 52(56.5%) respondents agreed that there had been an increase in the number of patients seeking medical services at the Nairobi Hospital, 28(30.4%) strongly agreed, while 12 (13.0%) disagreed with the statement. Overall, the mean recorded at 3.17 with a low standard deviation of 0.64, which means that the respondents generally agreed that there had been an increase in the number of patients seeking medical services at the Hospital. These findings support the study findings by Gutierrez and Nishtar (2015) that HMIS is instrumental in enhancing the flow of patients who seek for services at the healthcare.

From the study findings in Table 4.14, it was noted that 64(69.6%) respondents agreed that the Nairobi Hospital had over the years achieved growth in revenue from the services it offers, 24(26.1%) strongly agreed, while 4(4.3%) strongly disagreed

with the statement. The overall mean recorded at 3.17 with a low standard deviation of 0.64; which implies that majority of the respondents generally agreed that the Nairobi Hospital had over the years achieved growth in revenue from the services it offers. These findings support the study findings by Sahay and Nicholson (2014) that HMIS increases incomes through billing and official document preparation processes are performed in a reliable manner.

The findings also show that 60(65.2%) respondents agreed that the Hospital has had an improvement in patient satisfaction with the services offered at the Hospital over the years, 16(17.4%) strongly agreed, 12(13.0%) disagreed, while 4(4.3%) strongly disagreed to the statement. The overall mean was 2.96 with a low standard deviation of 0.69; this implies that majority of the respondents were agreed that the Nairobi Hospital had an improvement in patient satisfaction with the services offered at the Hospital over the years. These findings support the study findings by Huka (2013) that satisfaction of a patient is quite a significant tool within the growing patterns on the way to accountability amongst the providers of healthcare.

The results also indicated that 44(47.8%) respondents agreed that there had been improved work coordination and teamwork at the Hospital over the years, 24(26.1%) strongly agreed, 16(17.4%) disagreed, while 8(8.7%) strongly disagreed to the statement. The overall mean was 2.91 with a low standard deviation of 0.89, an indication that majority of the respondents agreed that there had been improved work coordination and teamwork at the Hospital over the years. These findings go hand in hand with research findings by Solt (2015) who found that HMIS produce information on distribution of labor costs, quality control and personnel productivity.

The results show that 56(60.9%) respondents agreed that there had been better and efficient delivery of the services offered at the Nairobi Hospital over the years, 24(26.1%) disagreed, while 12(13.0%) strongly agreed to the statement. The overall mean recorded at 2.87 with a low standard deviation of 0.62; this implies that majority of the respondents generally agreed that there had been better and efficient delivery of the services offered at the Hospital over the years. These findings support the study findings by Vegoda (2014) that HMIS should ensure availability of correct information to the relevant individuals at appropriate timing.

Further, the study revealed that 64(69.6%) respondents agreed that patient and staff safety had improved over the years, 12(13.0%) disagreed, while 8(8.7%) either strongly disagreed or strongly agreed to the statement. The overall mean was 2.78 with a low standard deviation of 0.72, implying that respondents generally agreed that patient and staff safety had improved over the years. These findings support the study findings by Bajwa (2013) that HMIS standardizes reporting by management towards supporting patient care and administrative applications and reducing effort and time used on health knowledge from employees like nurses, pharmacists and doctors.

The study findings show that 44(47.8%) respondents agreed that there had been improvement in the processes and turnaround time at the hospital over the years, 32(34.8%) disagreed, 12(13.0%) respondents strongly agreed, 4(4.3%) strongly disagreed with the statement. The overall mean recorded at 2.70 with a low standard deviation of 0.75, which means that majority of the respondents were in agreement that there had been improvement in the processes and turnaround time at the hospital over the years. Saarinen (2014) also noted that HMIS technology internationally is elevating the efficacy of delivery of health services, reduction of

medical mistakes, refining care quality, and giving proper information for physicians and patients.

The study further established that 52(56.5%) respondents agreed that staff morale had improved over the years, 16(17.4%) of the participants either strongly disagreed or disagreed, while 8(8.7%) strongly agreed with the statement. The overall mean was 2.57 with a low standard deviation of 0.88; implying that respondents were generally agreed. These findings contradict the study findings by Lorenzi (2013) who attributed low staff morale as an obstacle to use of health information and mostly occasioned by poor data quality and network problems.

Effect of Hospital Management Information System Functionalities on Performance

Participants were asked to indicate their level of agreement on the effect of hospital management information system on performance. Table 4.15 presents the results.

Table 4.15: Hospital Management Information System Functionalities on Performance

Statement	Strongly Disagree		Disagree		Agree		Strongly Agree		Mean	Std Dev
	F	%	F	%	F	%	F	%		
HMIS functionalities have led to health care cost reduction at the Hospital	8	8.7	12	13.0	64	69.6	8	8.7	2.96	0.75
HMIS functionalities have led to improved processes/operations at the Hospital	4	4.3	16	17.4	52	56.5	20	21.7	3.00	0.73
HMIS functionalities have led to improved patient turnaround time.	0	0	8	8.7	64	69.6	20	21.7	3.13	0.54
HMIS functionalities have led to improved financial control at the Hospital	16	17.4	24	26.1	40	43.5	12	13.0	2.52	0.93
HMIS functionalities have led to efficient service delivery at the Hospital	0	0	16	17.4	60	65.2	16	17.4	3.00	0.59
HMIS functionalities have led to growth in revenue at the Hospital	4	4.3	8	8.7	64	69.6	16	17.4	3.00	0.66
HMIS functionalities have improved work coordination and teamwork at the Hospital	4	4.3	16	17.4	52	56.5	20	21.7	2.96	0.75
HMIS has led to improved customer experience at the Hospital	4	4.3	24	26.1	40	43.5	24	26.1	2.91	0.83
HMIS has led to improved patient satisfaction at the Hospital	4	4.3	20	21.7	48	52.2	20	21.7	2.91	0.78
HMIS has led to improved staff morale	16	17.4	20	21.7	52	56.5	4	4.3	2.48	0.83
HMIS has led to improved safety of patients and staff	12	13.0	24	26.1	44	47.8	12	13.0	2.61	0.88

Based on Table 4.15, it was established that 64(69.6%) respondents agreed that the Nairobi Hospital management information functionalities had led to improved patient turnaround time 20 (21.7%) strongly agreed to the statement, while 8(8.7%) disagreed with the statement. The overall mean recorded at 3.13 with a low standard deviation of 0.54; this implies that majority of the respondents generally agreed that the Hospital management information system functions had led to improved patient turnaround time. These findings concur with the study findings by Chamorro (2013)

who noted that hospital management information systems had greatly reduced red tape practices in public hospitals today.

The results also show that 60(65.2%) respondents agreed that the Nairobi Hospital management information functionalities had led to efficient service delivery at the facility, while 16(17.4%) either strongly agreed or disagreed with statement. The overall mean was 3.00 with a low standard deviation of 0.59, an indication that most of the respondents agreed that Hospital management information system functions have led to efficient service delivery at the facility. These findings concur with the study findings by Turbit (2013) that healthcare information systems enable the capturing and information dissemination to the makers of decisions for proper healthcare coordination at population and personal levels.

From Table 4.15, 52(56.5%) respondents agreed that the Nairobi Hospital management information functionalities had led to improved processes/operations at the Hospital, 20(21.7%) strongly agreed, 16 (17.4%) disagreed, while 4(4.3%) strongly disagreed with the statement. The overall mean was 3.00 with a low standard deviation of 0.73, which implies that majority of the respondents agreed that the Hospital management information system functionalities had led to improved processes/operations at the Hospital. These findings concur with the study findings by Cheelo (2013) that hospital management information systems provide an established framework entailing various information concerning managerial, financial and medical operations of a certain hospital.

Further, it was established that 64(69.6%) respondents agreed that the Nairobi Hospital management information functionalities had led to growth in revenue at the Hospital, 16(17.4%) respondents strongly agreed, 8(8.7%) disagreed, while 4(4.3%)

strongly disagreed with the statement. The overall was 3.00 with a low standard deviation of 0.66, which implies that majority of the respondents generally agreed that the Hospital management information system functionalities had led to growth in revenue at the Hospital. These findings concur with the study findings by Burger (2017) that Hospital information management functionalities should be able to meet the needs of patients, healthcare staff, the managers, and system designers.

The results also showed that 52(56.5%) respondents agreed that the Hospital management information functionalities had improved work coordination and teamwork at the Hospital, 20(21.7%) strongly agreed, 16(17.4%) disagreed, while 4(4.3%) strongly disagreed with the statement. The overall mean was 2.96 with a low standard deviation of 0.75. This implies that majority of the respondents generally agreed that Hospital management information functionalities had improved work coordination and teamwork at the Hospital. These findings concur with the study findings by Vitale (2016) which established that HMIS gives the advantages of streamlined operations, improved control and administration, superior care to the patient, strict control on cost and enhanced profitability.

The study findings also established that 64(69.6%) respondents agreed that the Hospital management information functionalities had led to health care cost reduction, 8(8.7%) strongly agreed, 12(13.0%) disagreed, while 8(8.7%) strongly disagreed with the statement. The overall mean was 2.96, with a low standard deviation of 0.75. In other words, this implies that majority agreed that Hospital management information functionalities had led to health care cost reduction at the Hospital. These findings support the observations made by Ndeti (2013) that

HMIS is an important component of care to patients as it gives appropriate information, to appropriate individuals and at ideal place.

The study results showed that 48(52.2%) respondents agreed that Hospital management information functionalities had led to improved patient satisfaction at the Hospital, 20(21.7%) strongly agreed or disagreed, while 4(4.3%) strongly disagreed with the statement. The overall mean was 2.91 with a low standard deviation of 0.78. Based on these findings, it implies that majority of the respondents agreed that the Hospital management information functionalities had led to improved patient satisfaction at the Hospital. These findings concur with the study findings by Heilbronn and Schreiweis (2016) which stated that in the modern day world, HMIS tends to be an important component of care to patients.

The results also showed that 40(43.5%) respondents agreed that the Hospital management information functionalities had led to improved customer experience at the Hospital, 24(26.1%) strongly agreed or disagreed, while 4(4.3%) strongly disagreed with the statement. The overall was 2.91 with a low standard deviation of 0.83. This finding implies that majority of the respondents agreed that hospital management information functionalities had led to improved customer experience at the Hospital. The findings concur with the study findings by Mailu (2015) who noted that with adoption of HMIS, there will be patient satisfaction and efficient service delivery which will in turn increase the number of patient's being served and ultimately growth in revenue.

Similarly, the study results show that 44(47.8%) respondents agreed that HMIS functionalities had led to improved safety of patients and staff, 24(26.1%) disagreed, while 12(13%) of the participants either strongly disagreed or strongly agreed with the

statement. The overall mean was 2.61 with a low standard deviation of 0.88. In other words, the study findings imply that majority of the respondents generally agreed that the Hospital management information functionalities had led to improved safety of patients and staff. These findings concur with the study findings by Mutuma (2014) who noted that HMIS functionalities increase in incomes through billing and official document preparation processes are performed in a reliable manner.

The study findings revealed that 40(43.5%) respondents agreed that HMIS functionalities had led to improved financial control at the Hospital, 24(26.1%) disagreed, 16 (17.4%) strongly disagreed, while 12(13.0%) strongly agreed with the statement. The overall mean was 2.52 with a low standard deviation of 0.93. This implies that majority agreed that hospital management information system functionalities has led to improved financial control at the Hospital.

The study findings revealed that 52(56.5%) respondents agreed that HMIS functionalities had led to improved staff morale, 20(21.7%) disagreed, 16 (17.4%) strongly disagreed, while 4(4.3%) strongly agreed. The overall mean was 2.48 with a low standard deviation of 0.83, which implies that the majority of the respondents agreed that the Hospital management information system functionalities had led to improved staff morale. These findings concur with the study findings by Atta-Mensah (2016) who asserted that with HMIS functionalities, all the information on personnel can be followed and made accrual processing, which include modules in the form of staff records, leaves, staff movements, and promotions accrual.

Karl Pearson Moment Correlation Analysis

In order to explain the relationship between HMIS functionalities and performance of The Nairobi Hospital, correlation analysis was conducted. The results were as shown in Table 4.16.

Table 4.16: Karl Pearson Moment Correlation Analysis

		Performance of Nairobi Hospital	Medical record management Functionality	Laboratory information Functionality	Procurement management Functionality	Pharmacy management Functionality
Performance Of Nairobi Hospital	Pearson Correlation	1				
	Sig. (2-tailed)					
	N	92				
Medical Record Management Functionality X1	Pearson Correlation	.414**	1			
	Sig. (2-tailed)	.000				
	N	92	92			
Laboratory Information Management Functionality X2	Pearson Correlation	.431**	.147	1		
	Sig. (2-tailed)	.000	.163			
	N	92	92	92		
Procurement Management Functionality X3	Pearson Correlation	.400**	.305**	.167	1	
	Sig. (2-tailed)	.000	.003	.112		
	N	92	92	92	92	
Pharmacy Management Functionality X4	Pearson Correlation	.379**	.150	.124	.240*	1
	Sig. (2-tailed)	.000	.154	.240	.021	
	N	92	92	92	92	92

The findings in Table 4.16 show that there was a positive correlation between medical record management functionality and performance of Nairobi Hospital as revealed by a Pearson correlation coefficient factor of 0.414. This fair relationship was found to be statistically significant since the p-value was 0.00, which was less than 0.05. These findings support the contention by Alimo-Metcalf (2014) that electronic health

records eliminate the need to store documents in bulky file cabinets, which frees up more space in the office for medical supplies and equipment and other essentials.

The study also found a strong positive correlation between performance of the Nairobi Hospital and adoption of laboratory information management functionality as shown by Pearson correlation coefficient of 0.431 and a statistical significant value (p) of 0.00 that was less than 0.05. These results support the research findings by Vegoda (2014) that computerized notes are often easier to read than a physician's handwriting adding that this reduces the risk of errors and misinterpretations that can negatively impact the quality of patient care.

The study found a positive correlation between procurement management functionality and performance of The Nairobi Hospital as shown by correlation coefficient of 0.400. The significant value was 0.000, which is less than 0.05. The findings support the empirical findings by Bajwa (2013) that procurement technology allows for electronic document storage, which simplifies a number of processes.

The study found a positive correlation between pharmacy management functionality and performance of the Nairobi Hospital as shown by correlation coefficient of 0.379. The significant value was 0.000, which is less than 0.05. The findings support the empirical findings by Saarinen (2014) that processing medical records electronically allows healthcare facilities to move faster and function more efficiently, reducing administrative costs.

Organization Culture

There was established the level of agreement on the effect of organization culture on performance and the results are as per Table 4.17.

Table 4.17: Statements Regarding Organizational Culture

Statement	Strongly disagree		Disagree		Agree		Strongly agree		mean	std dev
	F	%	F	%	F	%	F	%		
The employees at the Hospital maintain core values in the execution of their duties which has eased the use of HMIS and enhanced the performance at the Hospital	4	4.3	4	4.3	56	60.9	28	30.4	3.17	0.70
The employees at the Hospital have a positive attitude towards work which has eased the use of HMIS and enhanced the performance at the Hospital	4	4.3	8	8.7	12	13.0	68	73.9	3.57	0.83
The employees at the Hospital value the organization's mission and vision	4	4.3	8	8.7	44	47.8	36	39.1	3.22	0.78
The organizational culture unites all the employees at the Hospital towards the same goals	4	4.3	12	13.0	60	65.2	16	17.4	2.96	0.69
The Hospital employees value team work as opposed to individualism	0	0	8	8.7	64	69.6	20	21.7	3.13	0.54

According to Table 4.17, the results show that 68(73.9%) respondents strongly agreed that employees at the Hospital had a positive attitude towards work which has eased the use of HMIS functionality and enhanced the performance at the Hospital, 12(13.0%) agreed, 8(8.7%) disagreed, while 4(4.3%) strongly disagreed to the statement. The overall mean was 3.57 with a low standard deviation of 0.83. In other words, this implies that majority of the respondent agreed that employees at the Hospital had a positive attitude towards work which has eased the use of HMIS functionality and enhanced the performance at the Hospital. These findings support the study findings by Magee (2012) that strong organizational structure allows employees to clearly understand the divisions between all levels of management.

The results show that 44(47.8%) respondents agreed that that employees at the Hospital valued the organization's mission and vision, 36(39.1%) strongly agreed, 8(8.7%) disagreed, while 4(4.3%) strongly disagreed with the statement. The overall mean was 3.22 with a low standard deviation of 0.78. This implies that majority of the respondents generally agreed that employees at the Hospital valued the organization's mission and vision. These findings concur with study findings by Robbins (2012) that strong organizational structure allows a facility to better focus on a single set of goals instead of each group working toward its own agenda.

The study also established that 56(60.9%) respondents agreed that employees at the Hospital maintained core values in the execution of their duties which had eased the use of HMIS functionality and enhanced the performance at the Hospital, 28(30.4%) strongly agreed, while 4(4.3%) disagreed or strongly disagreed to the statement. The overall mean was 3.17 with a low standard deviation of 0.70. This implies that majority of the respondents agreed that employees at the Hospital maintained core values in the execution of their duties which had eased the use of HMIS and enhanced the performance at the Hospital. These findings support the study findings by Schein (2011) that a strong culture can improve everything from employee retention to the amount of revenue your organization generates.

The study results showed that 64(69.6%) respondents agreed that Hospital employees valued teamwork as opposed to individualism, 20(21.7%) strongly agreed, while 8(8.7%) disagreed with the statement. The overall mean was 3.13 with a low standard deviation of 0.54. This implies that majority of the respondents agreed that Hospital employees valued teamwork as opposed to individualism. These findings support the research findings by Ismail et al. (2017) that strong organizational culture promotes

an environment that encourages and welcomes knowledge sharing and collaboration, and rewards positive behavior.

The findings further established that 60(65.2%) respondents agreed that organizational culture united all the employees at the Hospital towards the same goals, 16(17.4%) strongly agreed, 12(13%) disagreed, while 4(4.3%) strongly disagreed to the statement. The overall mean recorded at 2.96 with a low standard deviation of 0.69. This implies that majority of the respondents agreed that organizational culture united all the employees at the Hospital towards the same goals. These findings support the study findings by Basu (2013) that culture of an organization is essentially a guiding force for all activities and personnel.

Organizational Leadership

The study sought to establish the level of agreement on the effect on organizational leadership on performance and the results are as per Table 4.18.

Table 4.18: Statement Regarding Organizational Leadership

Statement	Strongly disagree		Disagree		Agree		Strongly agree		Mean	Std Dev
	F	%	F	%	F	%	F	%		
The leadership at the Hospital motivates the employees towards the achievement of the organizations' objectives which has eased the use of HMIS and enhanced the performance at the Hospital	16	17.4	24	26.1	40	43.5	12	13.0	2.52	0.93
The leadership recognize employees' initiatives and creativity which has eased the use of HMIS and enhanced the performance at the Hospital	16	17.4	20	21.7	48	52.2	8	8.7	2.52	0.88
The employees at the Hospital are given leadership opportunities when they arise.	12	13.0	28	30.4	36	39.1	16	17.4	2.61	0.93
The Hospital leadership provides the necessary resources to all employees which has eased the use of HMIS and enhanced the performance at the Hospital	8	8.7	12	13.0	60	65.2	12	13.0	2.83	0.76
The employee's roles and responsibilities at the Hospital are clearly defined which has eased the use of HMIS and enhanced the performance at the Hospital	4	4.3	16	17.4	52	56.5	20	21.7	2.96	0.75

According to Table 4.18, the results show that 52(56.5%) respondents agreed that the employee's roles and responsibilities at the Hospital were clearly defined which had eased the use of HMIS functionality and enhanced the performance at the Hospital, 20(21.7%) strongly agreed, 16(17.4%) disagreed to the statement, while 4(4.3%) strongly disagreed with the statement. The overall mean recorded at 2.96 with a low standard deviation of 0.75. In other words, this implies that majority agreed that the

employee's roles and responsibilities at the Hospital are clearly defined which had eased the use of HMIS functionality and enhanced the performance at the Hospital. These findings support the study findings by Reger (2015) that leaders must instantaneously be change agents and gravity centers keeping interior focus and enabling the organization and people to be effective and be focused on the customer.

Results also show that 60(65.2%) respondents agreed that the Hospital leadership provided the necessary resources to all employees which had eased the use of HMIS functionality and enhanced the performance at the hospital, 12(13%) strongly agreed or disagreed, while 8(8.7%) strongly disagreed to the statement. The overall mean was 2.83 with a low standard deviation of 0.76. Based on the measurement scale the obtained mean score implies that majority of the respondents agreed that the Hospital leadership provided the necessary resources to all employees which had eased the use of HMIS functionality and enhanced the performance at the Hospital. These findings support the study findings by Reger (2015) that leaders must instantaneously be change agents and gravity centers keeping interior focus and enabling the organization and people to be effective and be focused on the customer.

The findings revealed that 36(39.1%) respondents agreed that employees at the Hospital were given leadership opportunities when they arose, 28(30.4%) disagreed, 16 (17.4%) strongly agreed, while 12(13.0%) strongly disagreed to the statement. The overall mean score was 2.61 with a low standard deviation of 0.93. As per the measurement scale, the obtained mean score implies that the majority of the respondents agreed that employees at the Hospital were given leadership opportunities when they arose. These findings support assertion by Alimo-Metcalfe (2014) that leadership has the capacity of directly stimulating businesses to achieve effectiveness.

The study established that 48(52.2%) respondents agreed that the Hospital leadership recognized employees' initiatives and creativity which had eased the use of HMIS functionality and enhanced the performance at the Hospital, 20(21.7%) disagreed, 16(17.4%) strongly disagreed, while 8(8.7%) strongly agreed to the statement. The overall mean score was recorded at 2.52 with a low standard deviation of 0.88. Based on the measurement scale, the obtained mean score translates to agree, which implies that majority of the respondents generally agreed that the Hospital leadership recognized employees' initiatives and creativity which had eased the use of HMIS functionality and enhanced the performance at the Hospital. These findings support the study findings by Akbolat (2018) that leadership is a very key role in management which entails employees' motivation towards a joint objective.

The results showed that 40(43.5%) respondents agreed that the leadership at the Hospital motivated the employees towards the achievement of the organizations' objectives which had eased the use of HMIS functionality and enhanced the performance at the hospital, 24(26.1%) disagreed, 16(17.4%) strongly disagreed, while 12(13.0%) strongly agreed to the statement. The overall mean score was recorded at 2.52 with a low standard deviation of 0.93. Based on the measurement scale, the obtained mean score translates to agree, which implies that majority of the respondents agreed that leadership at the Hospital motivated the employees towards the achievement of the organizations' objectives that had eased the use of HMIS functionality and enhanced the performance at the Hospital. These findings support the study findings by Ozyurt (2009) that leaders provide the direction to the firm on where they need to be & how to get there.

Summary of Key Findings

1. This study found that six respondents felt that the laboratory information management functionality had been fully implemented, two respondents felt that the medical record management functionality had been fully implemented, two respondents felt that the procurement management functionality had been fully implemented, and twenty-nine respondents felt that the pharmacy management functionality was fully functional.
2. The results disclosed that the HMIS functionalities provided up-to-date information about the patients at the Hospital, HMIS functionalities provided feedback on patient care processes and that HMIS functionalities had facilitated better coordination of the healthcare services at the hospital.
3. Results also showed that the Nairobi Hospital had witnessed an increase in the number of patients seeking medical services at the Hospital because of the facility expansion and also that the system had been instrumental in enhancing the flow of patients who seek for healthcare services. Results also showed that there had been improvement in the level of patient care at the hospital over the years.
4. HMIS functionalities were linked with improved work coordination and teamwork at the Nairobi Hospital over the years, significant improvements on cost reduction because some departments like the laboratory had become paperless, which had also enhanced profitability, quality control through streamlined operations and personnel productivity and better and efficient delivery of the services offered at the Nairobi Hospital over the years.
5. There was a positive correlation between medical record management functionality and performance of Nairobi Hospital. The study also found a strong

positive correlation between performance of the Nairobi Hospital and adoption of laboratory information management functionality. The study found a positive correlation between procurement management functionality and performance of the Nairobi Hospital. The study found a positive correlation between pharmacy management functionality and performance of the Nairobi Hospital.

Summary

This chapter focused on the analysis of data, presentation and interpretation of the findings on the effect of hospital management information system functionalities on the performance of health care institutions in Kenya: a case of The Nairobi Hospital. The conclusions, discussions of key findings and recommendations of the study were presented in the next chapter.

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CHAPTER FIVE

DISCUSSIONS, CONCLUSIONS AND RECOMMENDATIONS

Introduction

This chapter presents a discussion of research findings in relation to the research objectives. The objectives of the study were; to determine the hospital management information system functionalities at the Nairobi Hospital, to establish the performance at the Nairobi Hospital, and to reveal the effect of the hospital management information system functionalities on the performance of the Nairobi Hospital. The chapter further presents conclusions, recommendations, and areas for further research based on the study findings.

Discussions of Key Findings

Hospital Management Information System Functionalities

The first objective of this study was to identify the HMIS functionalities adopted at the Nairobi Hospital. It was identified that the Nairobi Hospital had adopted various HMIS functionalities, which include; medical record management functionality at 90(97.8%), laboratory information management functionality at 84(91.3%), procurement management functionality at 90(97.8%), pharmacy management functionality at 47(51.1%), doctor/nursing functionality at 70(76.1%), and management/information system (MIS) reporting functionality at 31(33.7%). On the extent to which the Nairobi hospital had implemented various HIMS functionalities, the study findings showed that most employees were unable to comment on whether the functionalities were fully or partially implemented for other departments apart from those they worked in. Nevertheless, this study found that six respondents felt that the laboratory information management functionality had been

fully implemented, two respondents felt that the medical record management functionality had been fully implemented and two respondents felt that the procurement management functionality had been fully implemented and twenty-nine respondents felt that the pharmacy management functionality was fully functional. These findings support the study assertion by Safdari and Ghazisaeidi (2014) that HMIS cuts out a lot of manual work that are performed in hospitals especially documentation and record keeping.

The Nairobi Hospital Performance

Descriptive reports from the participants revealed that the Nairobi Hospital had over time improved in the quality of services being offered and the systems and equipment being used. The Nairobi Hospital had expanded its services to other areas through the introduction of outpatient centres to access more clients. Further, the study noted that there was drastic improvement in the hospital performance as there had been expansion of hospital facilities and infrastructure, more so in ICT. Further, the findings revealed that the Hospital performance had improved with time, for instance, time spent at the registration desk and the triangle process clients underwent had reduced significantly. Similarly, the introduction of the doctor's functionality had also improved the treatment process.

The Nairobi Hospital had over the years improved its performance from the services/procedures undertaken at the facility. These findings support the study findings by Maatlin (2015) that HMIS should enhance effectiveness since units can communicate directly to the respective departments by just a click on the system. The results also showed that there had been improvement in the level of patient care at the hospital over the years. These confirms findings by Murphy (2015) that HMIS should

enhance procurement of materials to be used in the hospital for example the processing of local purchase orders (LPOs) and the tendering process.

The study findings also showed that the Nairobi Hospital had witnessed an increase in the number of patients seeking medical services at the Hospital. This depicts that HMIS is instrumental in enhancing the flow of patients who seek for healthcare services. Evidence also showed that over the years, the Nairobi Hospital had achieved growth in revenue from the services it offers, for example, reduced turn-around-time enhanced by the system. These findings support the study findings by Sahay and Nicholson (2014) that HMIS increases incomes through billing and official document preparation processes which are performed in a reliable manner.

The study established that the hospital management information system led to better strategic decisions made by increasing the efficiency of the supply chain at the hospital at 72(78.3%). Study results showed that there had been growth in revenue at The Nairobi Hospital over time at 80(87%). From satisfaction surveys, the Hospital had had an improvement in patient satisfaction with the services offered over the years, especially on the turn-around-time of the patients at 68(73.9). These findings support the study findings by Huka (2013) that satisfaction of a patient is quite a significant tool within the growing patterns on the way to accountability amongst the providers of healthcare. Similarly, HMIS was linked with improved work coordination and teamwork at the Nairobi Hospital, significant improvements of cost distribution of labor costs, quality control, personnel productivity, and better and efficient delivery of the services offered at the Nairobi Hospital over the years at 72(77.2%). These findings support the study findings by Vegoda (2014) that HMIS

should ensure availability of correct information to the relevant individuals at appropriate timing.

Evidence presented through descriptive and inferential study results on productivity at the Nairobi Hospital showed that staff safety had improved over the years at 56(60.8%). Consequently, HMIS had standardized reporting by management towards supporting patient care and administrative applications, and reducing effort and time used on health knowledge by employees like nurses, pharmacists and doctors. Further, technology was also linked with improved turnaround time at the Hospital over the years. These findings go hand in hand with the study findings by Saarinen (2014) that HMIS technology internationally is elevating the efficiency of delivery of health services, reduction of medical mistakes, refining care quality, and giving proper information for physicians and patients.

The study found that staff morale had improved over time at 56(60.8%), even though the HMIS was still not integrated and hence information was not easily obtained by a click of a button as it would be expected, it had eased work processes in the different departments. These findings support the study findings by Lorenzi (2013) who attributed low staff morale is an obstacle in using of health information and mostly occasioned by poor data quality and network problems.

Effect of Hospital Management Information System Functionalities on Performance

Drawing evidence from the statistical evidence, it was clear that the Nairobi Hospital management information system functionalities had led to improved patient turnaround time. It had greatly reduced red tape practices in the Hospital currently and that it had led to efficient service delivery at the Hospital. These findings concur with

the study findings by Turbit (2013) that healthcare information systems functionalities enabled the capturing and information dissemination to the makers of decisions for proper healthcare coordination at population and personal levels. The study results also disclosed that HMIS functionalities had led to improved processes/operations at the Nairobi Hospital. It also provided an established framework outlining various information concerning managerial, financial and medical operations. Further, HMIS functionalities had led to growth in revenue at the Nairobi Hospital. These findings concur with the study findings by Burger (2017) that HMIS functionalities should be able to meet the needs of patients, healthcare staff, managers and system designers.

Study results showed that HMIS functionalities had improved work coordination and teamwork at the Nairobi Hospital. HMIS also gave the advantages of streamlined operations, improved control and administration, superior care to the patient, strict control on cost and enhanced profitability. Further, adoption of HIMS had led to health care cost reduction at the Hospital. These findings support the observations made by Ndeti (2013) that HMIS is an important component of care to patients as it gives appropriate information, to appropriate individuals and at ideal place.

Study results also showed that HMIS functionalities had led to improved patient satisfaction at the Nairobi Hospital. Similarly, HMIS had led to improved customer experience at the Hospital, enhanced patient satisfaction, and efficient service delivery, which had in turn increased the number of patients being served and ultimately growth in revenue. Additionally, descriptive results showed that HMIS functionalities had led to; improved safety of patients and staff working at the Nairobi Hospital, increased in revenue because some processes were paperless, and efficient

billing and official document preparation processes, which were performed in a reliable manner.

Conclusion

Based on the study findings, this study concluded that the Nairobi Hospital had implemented various HMIS functionalities, which included: medical record functionality, laboratory management functionality, pharmacy management functionality, procurement management functionality, doctors/nursing functionality and management/MIS reporting functionality. However, the functionalities had not been fully integrated in all departments. Nevertheless, the Hospital had over the years improved its performance from the services/procedures undertaken at the facility. This was through improvement in the level of patient care and growth in revenue. There had been improvement in patient satisfaction with the services offered, improved work coordination and teamwork. There had also been efficiency of delivery of health services, reduction of medical mistakes and giving efficient delivery of information to patients.

The study further concluded that HMIS functionalities had led to improved patient turnaround time at the Nairobi hospital and also greatly reducing red tape practices in the Hospital, which in turn led to efficient service delivery at the hospital. Therefore, HMIS functionalities had improved work coordination, teamwork, health care cost reduction, revenue growth and improved patient satisfaction at the Nairobi Hospital.

Recommendations for Further Research

Given that some of the staff members could not comment on the extent to which other departments had embraced HMIS, this in itself depicts that the sub-systems under all the departments were not integrated. Therefore, the management of the Nairobi

Hospital should work towards ensuring that all the HMIS functionalities in all the departments are fully integrated for maximum benefits to be reaped.

Although the performance of the Hospital had improved over the years, mostly in terms of profitability due to revenue growth, there is need for ensuring that the health care is affordable to many patients. This can be done through ensuring that there is efficiency in operations and in turn reduction of patient costs while at the same time maintaining the quality of healthcare.

Since, there was a positive relationship between implementation of HMIS functionalities and hospital performance, the management at the hospital should ensure that HMIS functionalities are fully integrated in all departments so as to enhance efficiency of operations and further improve the hospital performance.

Areas for Further Research

This study sought to determine the effect of hospital management information system functionalities on the performance of the Nairobi Hospital. This study only featured one hospital, therefore, it would be essential in future for a similar study to be done on the same topic but focus on a number of hospitals and a comparison of the results done. A study can also be done on other factors affecting the performance of hospitals apart from hospital management information system functionalities.

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APPENDICES

Appendix A: Researcher's Letter of Introduction to Respondents

Dear respondent:

I am a Daystar University student pursuing a Master's Degree in Strategic Management. I am carrying out a study on EFFECT OF HOSPITAL MANAGEMENT INFORMATION SYSTEM FUNCTIONALITIES ON THE PERFORMANCE OF HEALTH CARE INSTITUTIONS IN KENYA: A CASE OF THE NAIROBI HOSPITAL. To achieve this, I am kindly requesting you to participate in this academic research by filling out the questionnaire. The information obtained will be used for academic purposes only and will remain confidential.

Your participation will be highly appreciated.

VICTORIA SHANGALA

Appendix B: Questionnaire

Please fill the questionnaire below by ticking in the relevant box and providing the necessary explanation in the open-ended questions.

Section A: Demographic Information

1. Kindly indicate your gender? [] Male [] Female
2. What is your age bracket?
 - [] 20-30 years [] 31-40 years [] 41-50 years [] Above 51 years
3. Please state the department you work in _____
4. Please state your position/title in the department _____
5. For how long have you worked at the Hospital?
 - [] 0-5 years [] 6-10 years [] above 11 years

Section B: Hospital Management Information System Functionalities

6. Please indicate which HMIS functions as stated below are fully or partially implemented:

	Partially	Fully
Medical record management functionality	[]	[]
Laboratory information management functionality	[]	[]
Procurement management functionality	[]	[]
Pharmacy management functionality	[]	[]
Doctor/Nursing Functionality	[]	[]
Management/MIS Reporting functionality	[]	[]

7. Please tick on the following statement regarding the HMIS functionalities.
Rate on a 4- point scale where: 1- Strongly disagree, 2-Disagree, 3- Agree, 4- Strongly agree

	Statement	Strongly disagree	Disagree	Agree	Strongly agree
1.	The HMIS functions provides accurate information about the patients at the hospital.				
2.	The HMIS functions provides up-to-date, information about the patients at the hospital.				
2.	The HMIS functions facilitates better coordination of the healthcare services at the hospital.				
3.	The HMIS functions have enabled provision of feedback on patient care at the hospital.				
4.	The HMIS functions at the hospital are of high quality.				
5.	The HMIS functions at the hospital are user friendly.				
6.	The HMIS functions at the hospital are responsive to user requirements.				
7.	The HMIS functionalities at the hospital are reliable.				

Section C: Hospital Performance

8. Describe the Performance of the Hospital over time. Indicate if it has improved or not. Describe where it has improved and where it needs to improve further.

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9. Please tick on the following statement regarding hospital performance. Rate on a 4- point scale where: 1- Strongly disagree, 2-Disagree, 3- Agree, 4- Strongly agree

		Strongly disagree	Disagree	Agree	Strongly agree
1.	The Hospital has over the years achieved growth in revenue from the services it offers.				
2.	The Hospital has over the years improved its productivity from the services/procedures undertaken at the Hospital.				
3.	The Hospital has had an improvement in patient satisfaction with the services offered at the Hospital over the years.				
4.	There has been an increase in the number of patients seeking medical services at the Hospital				
5.	There has been improvement in the level of patient care at the Hospital over the years				
6.	There has been improvement in the processes and turnaround time at the Hospital over the years				
7.	There has been better and efficient delivery of the services offered at the Hospital over the years				
8.	There has been improved work coordination and teamwork at the Hospital over the years				
9.	Staff morale has improved over the years				
10.	Patient and staff safety has improved over the years				

Section D: Effect of Hospital Management Information System Functionalities on Performance

10. Has the hospital management information system enhanced the performance of the organization? If yes indicate the areas, if not indicate the reasons

.....

11. Please tick on the following statement regarding the HMIS effect on hospital performance. Rate on a 4- point scale where: 1- Strongly disagree, 2- Disagree, 3- Agree, 4- Strongly agree

	Statement	Strongly disagree	Disagree	Agree	Strongly agree
1.	Hospital management information system functionalities have led to health care cost reduction at the Hospital				
2.	Hospital management information system functionalities have led to improved processes/operations at the Hospital				
3.	Hospital management information system functionalities have led to improved patient turnaround time.				
4.	Hospital management information system functionalities have led to improved financial control at the Hospital				
5.	Hospital management information system functionalities have led to efficient service delivery at the Hospital				
6.	Hospital management information system functionalities have led to growth in revenue at the Hospital				
7.	Hospital management information system functionalities have improved work coordination and teamwork at the Hospital				
8.	Hospital management information system has led to improved customer experience at the Hospital				
9.	Hospital management information system has led to improved patient satisfaction at the Hospital				
10.	Hospital management information system has led to improved staff morale				
11.	Hospital management information system has led to improved safety of patients and staff				

Section F: Organization Culture

12. Please tick on the following statement regarding organization culture. Rate on a 5- point scale where: 1- Strongly disagree, 2-Disagree, 3-Agree, 4- Strongly agree

		Strongly disagree	Disagree	Agree	Strongly agree
1.	The employees at the Hospital maintain core values in the execution of their duties which has eased the use of HMIS and enhanced the performance at the Hospital				
2.	The employees at the Hospital have a positive attitude towards work which has eased the use of HMIS and enhanced the performance at the Hospital				
3.	The employees at the Hospital value the organization's mission and vision				
4.	The organizational culture unites all the employees at the Hospital towards the same goals				
5.	The Hospital employees value team work as opposed to individualism				

SECTION G: Organizational Leadership

13. Please tick on the following statement regarding organizational leadership. Rate on a 4- point scale where: 1- Strongly disagree, 2-Disagree, 3-Agree,4- Strongly agree

		Strongly disagree	Disagree	Agree	Strongly agree
1.	The leadership at the Hospital motivates the employees towards the achievement of the organizations' objectives which has eased the use of HMIS and enhanced the performance at the Hospital				
2.	The leadership recognize employees' initiatives and creativity which has eased the use of HMIS and enhanced the performance at the Hospital				
3.	The employees at the Hospital are given leadership opportunities when they arise.				
4.	The Hospital leadership provides the necessary resources to all employees which has eased the use of HMIS and enhanced the performance at the Hospital				
5.	The employee's roles and responsibilities at the Hospital are clearly defined which has eased the use of HMIS and enhanced the performance at the Hospital				

Appendix C: Ethical Clearance

**THE NAIROBI HOSPITAL**

Our Ref. TNH/ADMIN/CEO/20/03/20

20 March 2020

Victoria Njambi Shangala
P. O. Box42 - 00200,
Nairobi

Dear Victoria,

RE: EFFECT OF HOSPITAL MANAGEMENT INFORMATION SYSTEM ON THE PERFORMANCE OF HEALTH CARE INSTITUTIONS IN KENYA: A CASE OF THE NAIROBI HOSPITAL

Reference is made to your request to carry out the above study at The Nairobi Hospital. We are pleased to advise that approval has been granted.

In line with the Research Projects Policy, you will be required to submit quarterly update reports of the study to the Committee. You are also required to submit a copy of the final findings for the Committee's records.

Do note that information/data collected and potential findings shall not be in conflict with the Hospital's Confidentiality Clause which states that "You will not without consent of the Association disclose any of its secrets or other confidential matters to anyone who is not authorized to receive them".

Please note that this approval is valid for the period March 2020 to March 2021, if an extension is required, a fresh application should be done before proceeding with the study.

Yours sincerely,
FOR: THE NAIROBI HOSPITAL

Dr. Allan Pamba
CHIEF EXECUTIVE OFFICER

C.c. Chairman - Bioethics & Research Committee



Healthcare with a difference

P.O. Box 30026 - 00100 Nairobi, Kenya | Tel: +254 020 2845000 | Fax: +254 020 2728003
Email: hosp@nbihosp.org | Website: www.nairobihospital.org

Appendix D: Introduction Letter from Daystar University



Valley Road Campus
P.O. Box 44400 - 00100
Nairobi, Kenya

Athi River Campus
P.O. Box 17, Daystar University,
90145, Athi River, Kenya

Tel: 0716 170 313 / 0748 100 759 /
0724256408-9 OR
0709 972 000 (30 lines)

Email: admissions@daystar.ac.ke
info@daystar.ac.ke

Facebook: daystar-universityofficial

Twitter: daystaruni

www.daystar.ac.ke

25th March 2020

National Council for Science & Technology,
P O Box 30623 – 00100,
NAIROBI.

Dear Sir/Madam,

RE: VICTORIA N. SHANGALA: STUDENT NO:17-0391

The above named person is a fully registered student in the School of Business and Economics at Daystar University. She is seeking a research permit from your office.

Victoria's thesis topic is:

“Effect of Hospital Management Information System on the Performance of Healthcare Institutions in Kenya: A Case of The Nairobi Hospital”.

Kindly accord her the necessary assistance to allow her to collect data.

Thanks in advance for your cooperation.


Yours sincerely,

**Dr. Samuel Muriithi,
HOD, COMMERCE.**




Appendix E: Research Permit

National Commission for Science, Technology and Innovation -




REPUBLIC OF KENYA



NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY & INNOVATION

Ref No: **191928** Date of Issue: **06/April/2020**

RESEARCH LICENSE




This is to Certify that Ms.. Victoria Njambi Shangala of Daystar University, has been licensed to conduct research in Nairobi on the topic: EFFECT OF HOSPITAL MANAGEMENT INFORMATION SYSTEM ON THE PERFORMANCE OF HEALTH CARE INSTITUTIONS IN KENYA: A CASE OF THE NAIROBI HOSPITAL for the period ending : 06/April/2021.

License No: **NACOSTIP/20/4703**

191928
Applicant Identification Number

W. Njambati
Director General
NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY & INNOVATION

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Appendix F: Approval Letter from The Nairobi Hospital

**THE NAIROBI HOSPITAL**

Our Ref. TNH/ADMIN/CEO/20/03/20

20 March 2020

Victoria Njambi Shangala
P. O. Box42 - 00200,
Nairobi

Dear Victoria,

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Please note that this approval is valid for the period March 2020 to March 2021, if an extension is required, a fresh application should be done before proceeding with the study.

Yours sincerely,
FOR: THE NAIROBI HOSPITAL

Dr. Allan Pamba
CHIEF EXECUTIVE OFFICER

C.c. Chairman - Bioethics & Research Committee



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Email: hosp@nbihosp.org | Website: www.nairobihospital.org

Appendix G: Plagiarism Report

EFFECT OF HOSPITAL MANAGEMENT INFORMATION SYSTEM FUNCTIONALITIES ON THE PERFORMANCE OF HEALTH CARE INSTITUTIONS IN KENYA: A CASE OF THE NAIROBI HOSPITAL

ORIGINALITY REPORT

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