INFORMATION AND COMMUNICATION CAPABILITY AND ORGANIZATIONAL PERFORMANCE OF REFERRAL HOSPITALS IN KENYA

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Abstract: The public health sector is essential to the status and stability of national and regional economies by providing quality and universal health services. However, there is limited consensus on how Information and Communication Technology (ICT) capability influence the performance of healthcare facilities. The study sought to determine the relationship between Information and Communication Technology (ICT) capability and organizational performance of referral hospitals in Kenya. This study used a descriptive research design. The unit of analysis comprised of referral hospitals in Kenya both national and county. The unit of observation was 159 individuals that comprised of 47 County referral hospitals' CEOs/Chief administrators, 47 County referral hospitals' Medical/clinical services in charge, 47 County referral hospitals' nursing in charge, 6 national referral hospitals' CEOs/Chief administrators, 6 national referral hospitals' Medical/clinical services in charge and 6 national referral hospitals' Nursing in Charge. Since the target population of the study was small, the study conducted a census, which means the whole population was involved in the study. This study used primary data, which was collected by use of semi-structured questionnaires. A pilot test was conducted to test the validity and reliability of the research instrument. This study generated both qualitative and quantitative data. The quantitative data in this research was analyzed by descriptive statistics and inferential statistics using Statistical Package for Social Sciences (SPSS version 24). Descriptive statistics included frequency distribution, mean (measure of central tendency), standard deviation (measure of dispersion) and percentages. Data was then presented in tables, charts and graphs. Thematic analysis was used in qualitative data analysis from the open ended questions. The results from qualitative data analysis were presented in a narrative form. The study also used a regression analysis to establish the relationship between the independent variable and dependent variables. The study found that ICT capability has a positive and significant effect on the organizational performance of referral hospitals in Kenya. The study established that organizational structure has a statistically significant moderating effect on the relationship between ICT Capability and the organizational performance of referral hospitals in Kenya. The study recommends that Kenyan referral hospitals should prioritize investment in ICT infrastructure, including hardware, software, and network capabilities. This can support the efficient management of patient records, streamline administrative processes, and enhance communication. In addition, the health facilities should develop training programs to enhance the ICT skills of hospital staff.

Key Words: Information and Communication Technology, Capability, Performance, Organizational Structure

Introduction

A good healthcare system is vital, in any country, as it means the population has access quality health care services to combat illness. In turn, this leads to a reliable workforce and hence a thriving economy (Popa & Ștefan, 2019). However, in comparison to developed countries, performance of public health in low-income and developing countries has been poor and slowly developing to meet health needs of populations. In addition, hospitals in most developing countries do not have the money and obtain information system (Giniunienea & Jurksiene, 2015). The need for effectiveness, changes in economy, efficiency, market concerns and performance evaluation call for changes in the healthcare sector through the utilization of Dynamic Capabilities (DC) like Information and Communication Technology (ICT) capability.

Information and Communication Technology (ICT) capability refers to an individual's or organization's ability to effectively utilize, manage, and leverage information and communication technologies (ICT) to achieve specific goals, solve problems, and enhance productivity (Arvanitis, Euripidis & Loukis, 2015). ICT capability in the health sector encompasses a wide range of technologies and systems designed to improve the delivery, management, and accessibility of healthcare services (Nilsson, 2017).ICT capability in the health sector continues to evolve, driving improvements in patient care, healthcare outcomes, and operational efficiency. As healthcare organizations increasingly embrace digital transformation, the role of ICT in healthcare is becoming even more central to delivering high-quality, accessible, and cost-effective healthcare services.

In France, El Morr and Subercaze (2017) indicated that the health care sector relies heavily on Information and Communication Technology capability, which is expected to be implemented in daily health care activities. Bertoncello and Baldo (2018) indicates that ICT capability in terms of electronic consultation, electronic communication and electronic payments among healthcare providers lead to an increase satisfaction levels, reduction in the specialists visits for patients and better integration of consultations and referrals in the United Kingdom. In Pakistan, Rehman and Zafar (2017) observed that dynamic capabilities enable health facilities to respond to technological advancements and emerging healthcare trends. They foster innovation, improve service delivery, enhance operational efficiency, and enable organizations to remain competitive. However, health facilities in Pakistan need to invest in technology infrastructure to enhance their dynamic capabilities.

Africa has been experiencing an increase in the adoption of ICT capabilities in both the private and public sectors. In Nigeria, Asikhia (2017) observed that ICT capabilities had a strong positive relationship with the performance of organizations. In Tanzania, Ismail (2022) indicate that Information and Communication Technology (ICT) capability in the Tanzanian health sector has the potential to significantly improve healthcare delivery, access, and efficiency. While the country has made progress in adopting ICT solutions, there is still room for growth and development in this area. Nshimiyimana (2021) observed that Rwanda has made remarkable strides in leveraging Information and Communication Technology (ICT) to enhance its healthcare sector. The country's ICT capability in healthcare has played a pivotal role in improving access to quality healthcare services, strengthening health systems, and achieving significant health outcomes. In Kenya, Deya, Oloko and Orwa (2017) observed that dynamic ICT capabilities had a significant effect on the competitive advantage of technical, vocational and entrepreneurship training institutions in Western Kenya Region.

Statement of the Problem

The healthcare sector plays a significant role in Kenya's economy, aligning with the Sustainable Development Goals (SDGs) and the Vision 2030 development agenda (Ministry of Health, 2021). A robust healthcare sector promotes a healthier workforce. Healthy workers are more productive, reducing absenteeism and improving overall economic productivity (Mulaki & Muchiri, 2019). The sector also directly contributes to achieving SDG 3 by providing access to quality healthcare services, reducing maternal and child mortality, and combating diseases like HIV/AIDS, malaria, and tuberculosis. Kenya's Vision 2030 recognizes the importance of the healthcare sector within its social pillar (Dinda & Ojera, 2016). The vision aims to provide accessible, affordable, and quality healthcare services to all Kenyans.

According to World Health Organization (2022), the health sector in Kenya is characterized by poor provision of services due to inadequate financing, inadequate medical supplies as well as inadequate and demotivated workforce. According to Mulaki and Muchiri (2019), patient satisfaction, turnaround time and efficiency in health care services delivery remain low. The level of patient satisfaction in County referral hospitals was 67.8%, which is lower than the acceptable customer satisfaction score of between 75% and 85% as indicated by Li, Zolbin and Krimmer (2022). In addition, the waiting time in County health facilities in Kenya (55.3 minutes) was higher than waiting time in health facilities in Rwanda and Uganda, which is 47 minutes and 43 minutes, respectively (World Health Organization, 2022).

Information and Communication Technology (ICT) capability plays a pivotal role in the health sector by transforming the way healthcare is delivered, managed, and accessed (Olatokun & Adeboyejo, 2019). It offers a wide range of benefits that improve patient care, streamline healthcare operations, and enhance overall health system performance. According to Yu (2016) ICT capability has a significant effect on organizational performance. In the healthcare sector, there is limited consensus on how ICT capability influences the performance of healthcare facilities as the concept of ICT capability in the health sector has not been adequately studied. It is therefore important to assess the influence of ICT capability and performance of health facilities in Kenya.

Studies conducted in Kenya on ICT capability and organizational performance, have been limited to firms within the private sector, and have used different methodologies. For instance, Wasonga (2015) examined ICT and performance of electronic health projects in Kenya; and Deya, Oloko and Orwa (2017) examined the association between dynamic ICT capabilities and competitive advantage of TVET institutions in Western Kenya. However, these studies focused on electronic health projects and TVET institutions. In terms of the methodology, both studies used a stratified random sampling in the selection of the sample size, but this study will adopt a census approach. This study therefore examined how ICT capability influences the performance of referral hospitals in Kenya as moderated by organizational structure.

H$_{01}$: ICT capability has no statically significant influence on organizational performance of referral hospitals in Kenya

H$_{02}$: Organizational structure has no statistically significant moderating effect on the influence of ICT capability on organizational performance of referral hospitals in Kenya

Theoretical Framework

This study was anchored on Technology Acceptance Theory, which was developed in 1986 by Davis and deals more particularly with the forecasting of information system acceptability. This theory aims at predicting tool acceptability and to identify various modifications which need to

be taken to the system so as to make it acceptable to users. According to this theory information system acceptability is influenced by two major factors: perceived ease of use and perceived usefulness. Perceived usefulness refers to the degree by which an individual believes that his performance was enhanced by use of a system. Perceived ease of use is the degree to which an individual believes that use of a system does not require effort. Numerous factorial analyses described that perceived ease of use and perceived usefulness can be regarded as two distinct dimensions (Olatokun & Adeboyejo, 2009). As demonstrated in reasoned Action theory, Technology Acceptance theory suggests that behavioral intention is determined by use of information system, although behavioral intention is influenced by an individual perception of system utility and attitude towards its use. Davis proposes that individual attitude is based on effect which the system may have on his performance and also determines his use on it. Therefore, even though an information system is welcomed by an employee, there is a high probability that he utilize it if he realizes that his work performance was improved by the system. Besides, theory of Technology acceptance hypothesizes a direct connection between perceived ease of use and perceived usefulness. With the same features being offered by two systems, the one that the user finds easier to use is considered to be more useful (Din *et al.*, 2017).

According to Nilsson (2012) individual attitude is significantly influenced by perceived ease of use through two key mechanisms: instrumentality and self-efficacy. Self-efficacy justifies that the more it is easy to use a system, the greater the user sense of efficacy should be. Moreover, the user feels he has power over what she is doing through an easy use tool (Wasonga, 2015). One of the key factors encouraging intrinsic motivation is efficacy and it illustrates direct link between perceived attitude and ease of use in the present study. Additionally, perceived ease of use is likely to contribute in improving performance of an individual. Since the users had not utilized less effort with an easy to use tool, he will be capable of sparing efforts in order to achieve other tasks (West, 2013). The research which was presented by Davis in order to validate the model suggests that connection between perceived usefulness and the aim to utilize information system is actually stronger compared to perceived ease of use. From to Davis model, therefore we can anticipate that most users are influenced by perceived usefulness of a tool
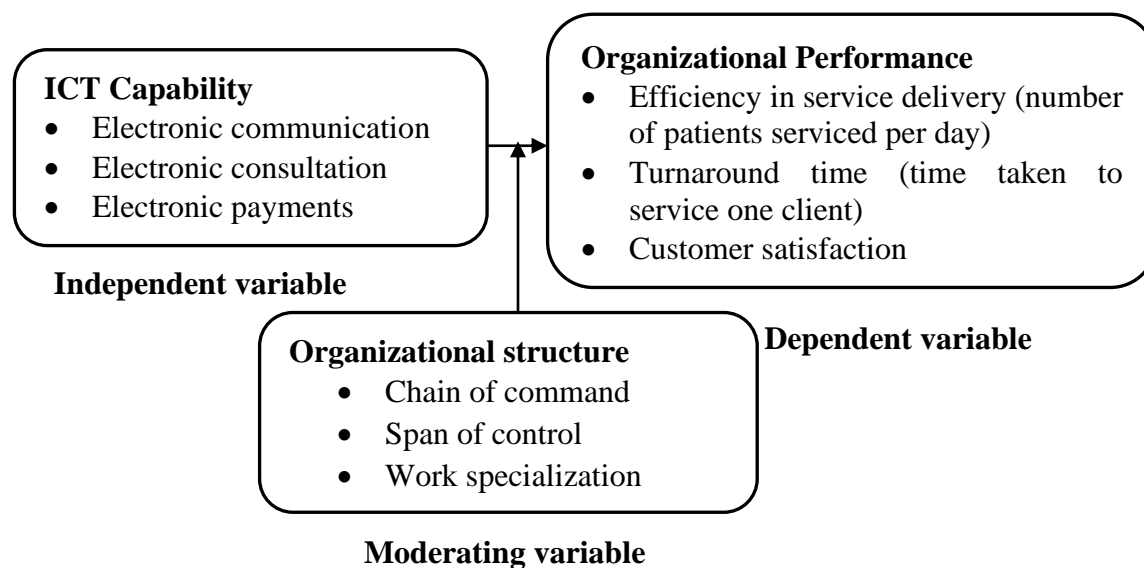
Although the initial TAM model was validated empirically, it only explained a portion of the variance of outcome variable, IT usage (from 4% to 45%, (Wasonga, 2015). Many writers have therefore upgraded previous model. In TAM2, Hassan et al. (2017) revealed that process of social influence processes (subjective norm, voluntarily, image) and processes of cognitive instrumental processes (job relevance, quality output, and result demonstrability) influenced perceived usefulness as well as intention to use. A notable upgrade of TAM model is suggested by (Olatokun & Adeboyejo, 2009). The assumption of their model is that 6 contextual variables (prior experience, computer anxiety, other's use, system quality, organizational support and task structure) affect the usage of dependent variable system via 3 mediating variables (perceived ease of use, computer efficacy and perceived usefulness).

Technology Acceptance Theory (TAT) primarily focuses on individual perceptions of usefulness and ease of use, often neglecting the influence of social and contextual factors (West, 2013). Critics argue that technology adoption and usage are not solely driven by individual perceptions but are also shaped by social norms, organizational factors, cultural influences, and other external variables. TAT tends to focus on initial technology adoption and usage intentions, often neglecting long-term technology acceptance and sustained usage behavior. In this study technology acceptance theory was employed to describe impact of ICT capability on performance of referral hospitals in Kenya. According to this theory, IT acceptability is normally influenced by 2 main factors: perceived ease of use and perceived usefulness. Moreover,

perceived usefulness of a system is essential since it makes the users believe that use of a system enhances their performance. On the other hand, perceived ease of use of technology makes users believe that they will not struggle when using the information technology.

Conceptual Framework

The study sought to examine relationship between ICT capability and organizational performance of referral hospitals in Kenya. The study independent variable was ICT capability, the moderating variable was organizational structure and the dependent variable was organizational performance of referral hospitals in Kenya.

ICT Capability
- Electronic communication
- Electronic consultation
- Electronic payments

Independent variable

Organizational Performance
- Efficiency in service delivery (number of patients serviced per day)
- Turnaround time (time taken to service one client)
- Customer satisfaction

Dependent variable

Organizational structure
- Chain of command
- Span of control
- Work specialization

Moderating variable

Figure 1: Conceptual Framework

Empirical Review

Din *et al.* (2017) assessed the role of e-governance and ICT in Pakistan health sector. The study utilized primary data which was gathered from 170 patients in public as well as private health care of Peshawar district. This is an exploratory research and descriptive statistics are deployed for data analysis. Study results showed that use of e-governance within health sector is at a rudimentary phase in the area of study. Few people utilize ICT for medical reasons although overall level is very low hence need of awareness. Additionally, the encouraging conditions for e-governance adoption in health sector consist of infrastructure, electricity data privacy and proper user interface as well as confidentiality.

Arvanitis, Euripidis and Loukis (2015) investigated impacts of ICT on innovation and European hospitals performance. The study was based on data acquired from 743 hospitals from a total of 18 European countries. The study specified and also estimated econometrically 5 equations: one for innovation of a product, one for innovation of process and three equations for three distinct dimensions of (ICT-aided) hospital performance. The study findings revealed that ICT has a positive effect on hospital innovation, and also the impacts of the latter on 3 measures of ICT enabled performance (growth of revenue, hospital processes efficiency, and quality patient care). Further to ICT, innovation associates positively with (ICT enabled) performance measures, and as a result, (1) innovation appears to strengthen ICT influence on performance, and (2) ICT

reveals not only direct but also indirect positive influence, via innovation, on performance of hospital.

Nilsson (2017) conducted a study on ICT as a tool for assistance in home care among middle-aged persons with serious chronic diseases and nurses. The findings of the study revealed that using ICT application enhanced people accessibility with serious chronic diseases living at home. Use of ICT application saved time and also eased nurses' work. In this study, their uses lead to more direct conversation between sick people and their nurses. This enhanced communication and led to less limitation on daily life for the sick people which appeared to mediate development of more trusting associations.

Wasonga (2015) examined ICT and performance of electronic health projects in Kenya using descriptive survey design. Population for this study was organizations running healthcare projects in Kenya. Ten organizations running projects that have adopted e-health systems were studied. A total of 5 respondents were randomly sampled from each of the organizations targeted. From the study, it was found that the use of e-health records, telemedicine, health information systems, the internet and mobile health influences the performance of healthcare projects. The study therefore concluded that ICT is used to a large extent in management of health records where they normally provide back up in cases of emergency. Further, it was found that ICT is used in telemedicine where it allows sharing of information between patients and healthcare providers.

Deya, Oloko and Orwa (2017) examined the association between dynamic ICT capabilities and competitive advantage of TVET instructions in Western Kenya. The study deployed descriptive survey design targeting principals as well as heads of sections and departments of TVET Institutions within western region that owned by state. A census of all Principals and also head of departments was performed. The study revealed that TVET Institutions in western Kenya has weak ICT capabilities and this position normally work against their effort to place themselves in modern dynamics of industry institution. However, the study revealed a positive association between Dynamic ICT Capabilities and Competitive Advantage of TVET Institutions located in western Kenya.

Research Methodology

This study adopted a positivism research philosophy and a descriptive survey research design. This study deployed descriptive research design since it gave an opportunity for analyzing qualitative as well as quantitative data in so as to determine population or phenomenon features under study. The target population of the study was 47 County referral hospitals and 6 national referral hospitals in Kenya. The unit of observation was 159 individuals that comprised of 47 County referral hospitals' CEOs/Chief administrators, 47 County referral hospitals' Medical/clinical services in charge, 47 County referral hospitals' nursing in charge, 6 national referral hospitals' CEOs/Chief administrators, 6 national referral hospitals' Medical/clinical services in charge and 6 national referral hospitals' Nursing in Charge. Since the target population of the study is small, the study conducted a census, which means the whole population was involved in the study.

This study employed both primary as well as secondary data. Secondary data was acquired from yearly reports of the health facilities and County Governments. The study used semi-structured questionnaires to collect primary data. The questionnaires comprised of both open ended and closed ended questions to enable participants to express their different view without feeling restricted by the researcher. The unstructured questions on the other hand were used as they

motivate participants to provide felt and in-depth answers without feeling hindered in disclosing any information.

A pilot test was conducted with 16 staff (10% of sample size) of Khunyangu Sub-County hospitalAccording to Bryman (2013), when performing a pilot test, researcher should use 10% of sample size. The study used three types of validity: content validity, face validity and construct validity. The content validity of the study was improved through seeking experts' opinions in the area of study, specifically the supervisors. The face validity of research tool was improved by conducting a pilot test and also changing any ambiguous and unclear question. Construct validity was assessed by use of average variance explained. Reliability of the research instrument was measured using Cronbach's alpha. A Cronbach's alpha value of 0.7 was deemed as acceptable. The pilot test results showed that the research instrument was valid and reliable.

Both quantitative data and qualitative data were generated by use of semi-structured questionnaires. Thematic analysis was used in qualitative data analysis from the open ended questions. The results from qualitative data analysis were presented in a narrative form. Descriptive as well as inferential statistics were used to analyze quantitative data with the support of Statistical Package for the Social Sciences (SPSS) version 24. Descriptive statistics comprised of percentages, mean, frequency distribution and also standard deviation. Inferential statistics consisted of univariate regression analysis. Testing of hypothesis was conducted using p-value since it gives more insight into the significance of a decision and helps in decisions concerning null hypothesis. Linear regression analysis was used in ascertaining the relationship between the independent variable and the dependent variable. Before conducting regression analysis, diagnostic tests were performed to test four major assumptions, which include linear relationship, multivariate normality, as well as homoscedasticity.

The linear regression model was as follows;

$$Y = \beta_0 + \beta_1 X_1 + \varepsilon$$

Where; Y = Organizational performance in referral hospitals in Kenya; B_0 =Constant; β_1= Beta Coefficients of determination; X_1 = ICT capability; ε = Error term (errors in the estimation of X_1 and y)

Moderation analysis was computed by use of hierarchical regression, whereby compounded standardized scores of ICT Capability; denoted as X_2 in the moderation model and organizational performance of referral hospitals relationship was computed first, followed by (organizational structure-Moderator-M), then lastly, interaction term, subsequently. The moderation analytical equation model based on hierarchical regression analysis is;

$$y = \beta_0 + \beta_2 X_2 + \beta_3 M + \beta_4 (X_2 * M) + \varepsilon$$

Where: y =Organizational performance of referral hospitals in Kenya;$\beta_0$is constant; β_2 is the beta coefficient of X_2(compounded scores of ICT capability); $\beta_3$is the beta coefficient of the moderator (organizational structure); **M** is the hypothesized moderator (organizational structure);$B_4$is the beta coefficient of (X_2 *M); the interaction term between compounded scores of ICT Capability$X_2$and the moderator (organizational structure); ε is an error term; (errors in the estimation of X_2 ,M and y)

Research Findings and Discussions

The sample size of this study consisted of all the 159 individuals that comprised of 47 County referral hospitals' CEOs/Chief administrators, 47 County referral hospitals' Medical/clinical services in charge, 47 County referral hospitals' nursing in charge, 6 national referral hospitals' CEOs/Chief administrators, 6 national referral hospitals' Medical/clinical services in charge and 6 national referral hospitals' Nursing in Charge.

Table 1: Questionnaires' Response Rate

Unit of analysis	Unit of observation	Sample Size	Responses	Percent
County referrals (47)	CEOs/Chief administrators	47	40	85.11
	Medical/clinical services in charge	47	42	89.36
	Nursing in Charge	47	39	82.98
National referrals(6)	CEOs/Chief administrators	6	5	83.33
	Medical/clinical services in charge	6	5	83.33
	Nursing in Charge	6	4	66.67
Total		**159**	**135**	**84.90**

Out of the 159 questionnaires that were distributed, 135 questionnaires were dully filled and returned to the researcher hence providing a response rate of 84.90%. Babbie (2017) suggests that 75 percent response rate is adequate for data analysis, drawing conclusions as well as making recommendation. This denotes that 84.90% response rate was adequate for data analysis.

General Information

The general information of the respondents comprised of the job description and duration of working in the current position.

Job Description

The respondents were required to specify their job description. The findings were as shown in Figure 2.
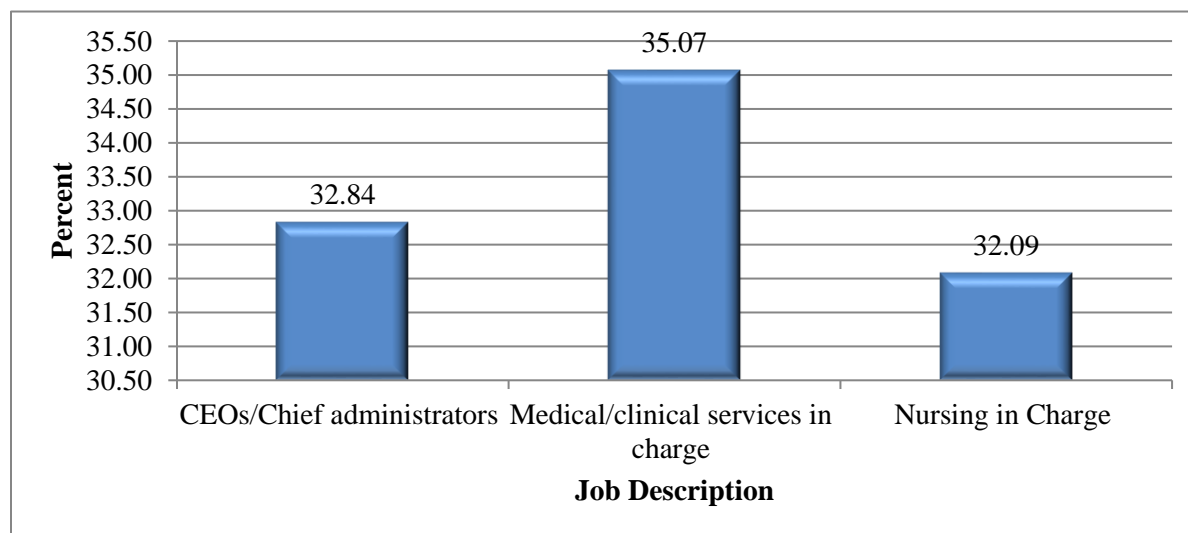

Figure 2: Job Description

As shown in Figure 2, 35.07% of the respondents revealed that they were medical/clinical services in charge, 32.84% were CEOs/Chief administrators and 32.09% were nursing in charge. This implies that individuals in all job categories participated in the study.

Duration of Working in the Current Position

The respondents were required to indicate the duration in which they have been working in the current position. The findings were as presented in Figure 3.
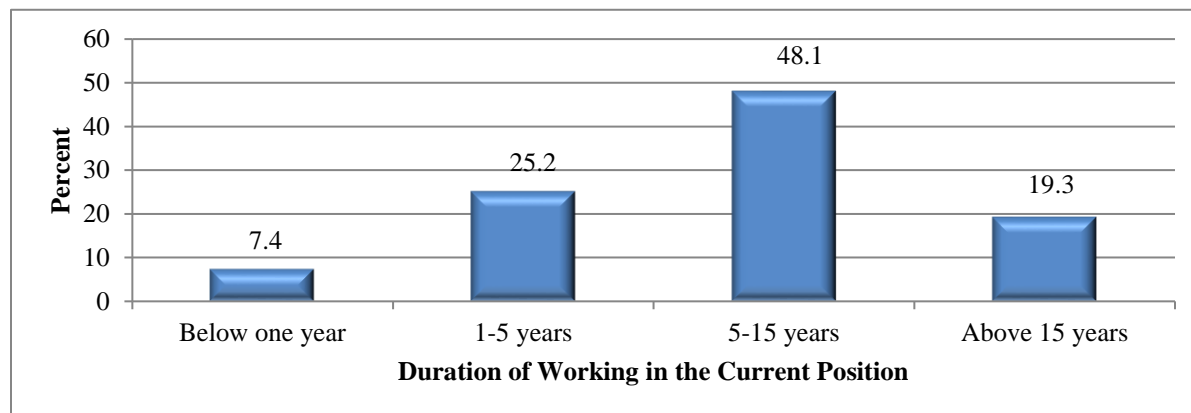
Figure 3: Duration of Working in the Current Position

According to the findings, 48.1% of the respondents pointed out that they have been working in the current position for between 5 and 15 years, 25.2% indicated for between 1 and 5 years, 19.3% indicated for more than 15 years and 7.4% indicated for less than 1 year. This means that most of the respondents have been working in the current position for more than 5 years and therefore, they had adequate information on dynamic capabilities and organizational performance of referral hospitals.

ICT Capability

The forth objective of the study was to assess the influence of ICT capability on organizational performance of referral hospitals in Kenya. The respondents were also asked to rate their level of agreement with various statements regarding ICT Capability of referral hospitals in Kenya. The findings were as displayed in Table 2.

Table 2: Aspects of ICT Capability

	Mean	Std. Deviation
Our organization uses emails as a means of communication	3.837	0.765
We have created WhatsApp group for communication	3.504	1.139
Our organization uses telephone call for communication	4.007	0.592
We use emails to consult from our supervisors	3.867	0.780
Telephone calls are used for consultation	4.037	0.565
WhatsApp groups are used for consultation in our organization	3.407	1.074
Cash is not accepted in our institution	3.400	1.073
All payments are made through M-pesa pay bill	3.474	0.945
Payments in our organization are made through bank transfer/bank payments	3.867	0.780

From to the findings, the respondents agreed with a mean of 4.007 (SD=0.592), the respondents

agreed that the organizations use telephone call for communication. The respondents also agreed with a mean of 3.837 (SD=0.765) that the organizations use emails as a means of communication. These findings conform to Wasonga (2015) findings that electronic communication for example sending messages and e-mail via electronic health record, between physicians and patients potentially have benefits over telephone communication and office visits. The respondents agreed that they have created WhatsApp group for communication. This is shown by a mean of 3.504 (SD=1.139).

The respondents agreed with a mean of 4.037 (SD=0.565) that telephone calls are used for consultation. In addition, they agreed that they use emails to consult from the supervisors as shown by a mean of 3.867 (SD=0.780). These findings concur with Kaleem (2019) findings that the use of electronic consultation such as email can provide the solution to quicker access to specialty advice to care providers without having to meet face to face. In addition, the respondents were neutral that WhatsApp groups are used for consultation in the organization. This is shown by a mean of 3.407 (SD=1.0741.057).

The respondents agreed with a mean of 3.867 (SD=0.780) that payments in their organizations are made through bank transfer/bank payments. These findings are in line with Wasonga (2015) findings that electronic payment enhances faster payment, transparency and better tracing of transactions, which induces cost savings, reduces time and encourages trusting associations between sellers and buyers. Nonetheless, the respondents were neutral that all payments are made through M-pesa pay bill as shown by a mean of 3.474 (SD=0.945). Moreover, they were neutral that Cash is not accepted in the institution as shown by a mean of 3.400 (SD=1.073).

The respondents were required to indicate the challenges faced with reference to implementation of ICT Capability in the organizations. The respondents revealed that there is frequent downtime in ICT, the system is prone to manipulation, the system experiences regular breakdown, ICT sector is abruptly changing within a shorter period and there is shortage of health IT workforce. Moreover, the respondents indicated that ICT requires adequate time to learn and adopt, the organization has inadequate broadband access and Internet infrastructure, there is lack of trained personnel and staffs are not motivated in using ICT.

The respondents revealed that the implementation of ICT Capability in the organization is faced by the challenge of financial constraints, high cost of installation, cyber-attacks risks, shortage of computers, some computers are not functioning and there is lack of a backup system in case of a computer failure. In addition, the respondents noted that the high cost of electronic equipment has led to some departments to still do manual work, the hospital lack adequate finances to adopt the modern technology and the system is prone to manipulation. These findings are in line with Kaleem (2019) arguments that the implementation of ICT Capability in the organization is faced by the challenge of financial constraints, regular breakdown, high cost of installation, cyber-attacks risks and shortage of computers.

Organizational Performance

The organizational performance of referral hospitals was the dependent variable in this study. The study used efficiency in service delivery, turnaround time and customer satisfaction as measures of organizational performance. The respondents were required to indicate their level of agreement with various statements regarding organizational performance of referral hospitals. The findings were as presented in Table 3.

Table 3: Aspects of Organizational Performance

	Mean	Std. Deviation
Medical equipment in our health facility are available	3.844	0.762
Number of out-patients serviced per day has been increasing	3.911	0.717
Number of in-patients serviced per day has been increasing	3.763	0.765
Turnaround time is very low	3.578	0.805
There is little queuing in the hospital	3.763	0.964
There are few customer complaints regarding the turnaround time	3.622	0.809
Customers are satisfied with the duration of time it takes for them to be serviced in the health facility	3.370	0.844
Customers in our health facility are satisfied with the doctors advice	3.904	0.656
Our customers always return to the health facilities for treatment or health advice	3.948	0.627

The respondents agreed with a mean of 3.911 (SD=0.717) that number of out-patients serviced per day has been increasing. Furthermore, they agreed that the medical equipment in the health facility are available as shown by a mean of 3.844 (SD=0.762). These findings are contrary to Mukuna (2016) findings that health facilities in Kenya lack infrastructure and key equipment. Furthermore, they agreed with a mean of 3.763 (SD=0.765) that the number of in-patients serviced per day has been increasing. In addition, the respondents agreed that turnaround time is very low as shown by a mean of 3.578 (SD=0.805).

The respondents agreed with a mean of 3.948 (SD=0.627) that their customers always return to the health facilities for treatment or health advice. Moreover, the respondents agreed with mean of 3.904 (SD=0.656) that customers in their health facility are satisfied with the doctors advice. With a mean of 3.763 (SD=0.964), the respondents agreed that there is little queuing in the hospital. The respondents further agreed with a mean of 3.622 (SD=0.809) that there are few customer complaints regarding the turnaround time. Nonetheless, the respondents were neutral that customers are satisfied with the duration of time it takes for them to be serviced in the health facility as shown by a mean of 3.370 (SD=0.844). These findings are contrary to Ndambuki (2013) findings that patient satisfaction, turnaround time and efficiency in health care services delivery remain low.

The respondents were asked to indicate the challenges faced with reference to organizational performance in the organization. The respondents noted that there is low manpower in relation to patients, diminishing work morale due to workload, lack of adequate personnel, poor medical infrastructure, and regular breakdown of medical equipment or lack of reagents, long admission procedure, lack of proper communication channels and lack of motivation. These findings are in line with Mukuna (2016) findings that 80% of public hospitals have no real plans for motivation of employees and talent management even though they reported significant problems in retaining specialist workers. These findings conform to the Ministry of Health (2018) reports that the health facilities in Kenya are characterized by shortage of staff and hence, at times, the management recruit interns and other unqualified staff. In addition, the respondents indicated that there are very long queues in the health facility and some of the patients go unattended. Moreover, the health facilities have a shortage of medicine in the health facility, there is shortage of medicine and the hospitals are serving a big area/population.

Table 4 shows the average turnaround time and patient satisfaction index in referral hospitals in Kenya.

Table 4: Turnaround time and Patient satisfaction index in Health Facilities

	Turnaround time	Patient satisfaction index
2016	60.7	63.7
2017	58.2	70.8
2018	49.8	72.8
2019	52.7	64.9
2020	55.3	62.8

From the results, the average turnaround time in referral hospitals in Kenya in 2016 was 60.7 minutes, which decreased to 58.2 minutes in 2017, 49.8 minutes in 2018, but increased to 52.7 minutes in 2019 and 55.3 minutes in 2020. The average patient satisfaction index was 63.7 in 2016, which increased tom 70.8 in 2017 and 72.8 minutes in 2018. In 2019, the patient satisfaction index decreased to 64.9 minutes and 62.8 minutes in 2020.

Regression Analysis

A univariate analysis was conducted to investigate the influence of ICT capability on organizational performance of referral hospitals in Kenya. The null hypothesis stated:

H_{01}: ICT capability has no statically significant influence on organizational performance of referral hospitals in Kenya

Table 5 shows the r-squared for the relationship between ICT capability and performance of referral hospitals.

Table 5: Model Summary for ICT Capability and Performance

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.726[a]	.528	.524	.31088

a. Predictors: (Constant), ICT Capability

The r-squared for relationship between ICT capability and performance of referral hospitals in Kenya was 0.528. This implies that ICT capability explains 52.8% of the variation in the performance of referral hospitals in Kenya. This further shows that 47.2% of the variation in the performance of referral hospitals in Kenya is accounted for by other factors not included in the model, and the error term.

Table 6 shows the significance of the model for the relationship between ICT capability and performance of referral hospitals in Kenya.

Table 6: ANOVA for ICT Capability and Performance

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	14.358	1	14.358	148.563	.000[b]
	Residual	12.854	133	.097		
	Total	27.212	134			

a. Dependent Variable: Organizational Performance
b. Predictors: (Constant), ICT Capability

Table 6 shows that the value of F-calculated (148.563) was higher than the value of F-critical

(3.871), and the p-value (0.000) was below the significance level (0.05). This indicates that the model fits the data well. The null hypothesis was therefore rejected, and the alternate hypothesis adopted. Therefore, the research study established that the ICT capability significantly influences the performance of referral hospitals in Kenya.

Table 7 shows the regression coefficients for relationship between ICT capability and performance of referral hospitals in Kenya.

Table 7: Regression Coefficients for ICT Capability and Performance

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.794	.244		3.262	.001
	ICT Capability	.785	.064	.726	12.189	.000

a. Dependent Variable: Organizational Performance

The regression model, derived from the research study results as presented in Table 7, is:

$$Y = 0.794 + 0.785X_1$$

The results from regression analysis showed that ICT capability has a positive and significant effect on organizational performance of referral hospitals (β_1=0.785, p-value=0.000). The beta coefficient was not zero and the p-value was 0.000, which was less than the significance level of 0.05. Therefore the null hypothesis (**H$_{01}$**) was rejected and the alternative hypothesis (**H$_{a1}$**) was accepted and hence there is statistically significant influence of ICT capability on organizational performance of referral hospitals in Kenya.

Moderating Effect Analysis

Moderating effect analysis was carried out to examine the moderating effect of organizational structure on the influence of ICT Capability on organizational performance of referral hospitals in Kenya.

The null hypothesis stated:

H$_{a2}$: Organizational structure has a statistically significant moderating effect on the influence of ICT Capability on organizational performance of referral hospitals in Kenya

Table 8: Model Summary for ICT Capability, Organizational Structure and Performance

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.726[a]	.528	.524	.31088
2	.761[b]	.579	.569	.29576

a. Predictors: (Constant), ICT Capability
b. Predictors: (Constant), ICT Capability, Organizational Structure, ICT Capability * Organizational Structure

The first model included: ICT Capability as the independent variable as well as the dependent variable, organizational performance. The R-squared for the relationship between ICT Capability and the organizational performance was 0.528. This implies that 52.8% of the variation in the organizational performance of referral hospitals can be explained by ICT Capability.

The second model comprised of ICT Capability, organizational structure, and the interactions between ICT Capability and organizational structure. The R-squared was 0.579 which implies

that 57.9% of the variation in the organizational performance of referral hospitals could be explained by the stated variables. The results depict that the introduction of organizational structure in the second model led to a 5.1% increase in R-squared.

Table 9: ANOVA for ICT Capability, Organizational Structure and Performance

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	14.358	1	14.358	148.563	.000[b]
	Residual	12.854	133	.097		
	Total	27.212	134			
2	Regression	15.752	3	5.251	60.025	.000[c]
	Residual	11.459	131	.087		
	Total	27.212	134			

a. Dependent Variable: Organizational Performance
b. Predictors: (Constant), ICT Capability
c. Predictors: (Constant), ICT Capability, Organizational Structure, ICT Capability * Organizational Structure

From the findings, and as portrayed in Table 9, the F-calculated for the first model was 148.563while that of the second model was 60.025. Since the F-calculated for the two models were greater than the F-critical (3.94) for the first model and for the second model (2.70), the two models were found to be a good fit for the data. The two models can therefore be used in predicting the moderating effect of organizational structure on the influence of ICT Capability on organizational performance of referral hospitals in Kenya.

Table 10: Coefficients for ICT Capability, Organizational Structure and Performance

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.794	.244		3.262	.001
	ICT Capability	.785	.064	.726	12.189	.000
2	(Constant)	-1.998	.972		-2.056	.042
	ICT Capability	1.378	.281	1.275	4.899	.000
	Organizational Structure	.874	.268	.874	3.258	.001
	ICT Capability * Organizational Structure	.193	.075	1.162	2.589	.011

a. Dependent Variable: Organizational Performance

Substituting the beta values as well as the constant term from the first step in regression modeling (as shown in Table 10) would result in the following model:

$Y = 0.794 + 0.785X_2$

In the first model, the results showed that ICT Capability has a positive and significant effect on organizational performance of referral hospitals ($\beta_1 = 0.794$, p-value=0.000).

In the second regression model, by substituting the beta values as well as the constant term, the model emanating from the second step in regression modelling is as follows:

$Y = -1.998 + 1.378X_2 + 0.874M + 0.193 X_3*M$

From the second model, the results show that the ICT Capability have a positive and statistically significant effect on organizational performance of referral hospitals in Kenya as shown by

unstandardized beta coefficient of 1.378 (p-value=0.000). The results further show that organizational structure had a positive and statistically significant influence on organizational performance of referral hospitals in Kenya as shown by unstandardized beta coefficient of 0.874 (p-value=0.001). The findings agree with Yi-Horng (2018) observation that organizational structure positively affects organizational performance of firms in Taiwan.

The results indicated that the interaction between ICT Capability and organizational structure has a positive and statistically significant effect on the organizational performance of referral hospitals in Kenya as shown by unstandardized beta coefficient of 0.193 (p-value=0.011). These findings are in line with Kantenet al (2017) observation that organizational structure moderates the relationship between ICT Capability and customer orientation.

H_{02}: Organizational structure has no statistically significant moderating effect on the influence of ICT Capability on organizational performance of referral hospitals in Kenya

H_{a2}: Organizational structure has a statistically significant moderating effect on the influence of ICT Capability on organizational performance of referral hospitals in Kenya

From stepwise regression analysis, the interaction between ICT Capability and organizational structure has a positive and statistically significant effect on the organizational performance of referral hospitals in Kenya (β_3=0.193, p-value=0.009). The beta coefficient was not zero and the p-value was 0.011, which was less than the significance level of 0.05. Therefore the null hypothesis (**H_{02}**) was rejected and the alternative hypothesis (**H_{a2}**) was accepted and hence organizational structure has a statistically significant moderating effect on the influence of ICT Capability on organizational performance of referral hospitals in Kenya.

Conclusions

The study concludes that ICT capability has a positive and significant effect on the organizational performance of referral hospitals in Kenya. Moreover, the study established that electronic communication, electronic consultation and electronic payments influenceorganizational performance. This means that improving ICT capability (electronic communication, electronic consultation and electronic payments) enhances organizational performance of referral hospitals.

The study also concludes that organizational structure has a statistically significant moderating effect on the relationship between ICT Capability and the organizational performance of referral hospitals in Kenya. The study discovered that chain of command, span of control and work specialization influence organizational performance. This means that enhancing organizational structure (chain of command, span of control and work specialization) will improve the organizational performance of referral hospitals.

Recommendations

The study found that sometimes, payments are made through electronic payments such as M-pesa pay bill and bank transfer. This study therefore recommends that the referral hospitals should encourage the patients to make payments through electronic methods of payment since they enhance faster payment, transparency and better tracing of transactions which reduces time and encourages trusting associations between the patients and the hospitals. In addition, payment through M-pesa pay bill and bank transfer help providers operate more efficiently as pressure mounts to cut costs while improving performance.

The study found that WhatsApp groups are at times used for consultation in the organization. Therefore, this study recommends that the employees in referral hospitals should use electronic consultations such as WhatsApp groups to help provide quick access to specialty advice to care providers without having to meet face to face. In addition,WhatsApp groups improve efficiency in service delivery and reduce turnaround time.

The study recommends that Kenyan referral hospitals should prioritize investment in ICT infrastructure, including hardware, software, and network capabilities. This can support the efficient management of patient records, streamline administrative processes, and enhance communication. In addition, the health facilities should develop training programs to enhance the ICT skills of hospital staff. Ensure that employees are proficient in using ICT tools and systems to maximize their benefits.

Areas for Further Research

The general objective of the study was to examine the influence of ICT capability on organizational performance of referral hospitals in Kenya. However, the study focused on referral hospitals hence, the findings cannot be applied to other categories of hospitals in Kenya. As a result, this study recommends that more studies should be done to determine how ICT capability influences organizational performance in Health Dispensaries, Health Centres and County Hospitals in Kenya. Furthermore, the study found that ICT capability can explain 52.8% of the organizational performance. As such, more studies should to be conducted to examine other factors that influence organizational performance. In addition, future research could explore the specific components of ICT capability (e.g., electronic health records, telemedicine) and their individual impacts on different aspects of organizational performance.

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