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Factors Influencing ICT Usage in the Healthcare Management System at Government Hospitals in Tanzania: A Case of Kilwa Road Police Hospital

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ABSTRACT

This study assesses the factors influencing Information and Communication Technology (ICT) usage in healthcare management systems at government hospitals in Tanzania, with a specific focus on Kilwa Road Police Hospital. The study aims to: examine the extent to which ICT infrastructure availability influences ICT usage in healthcare management systems; determine the influence of staff awareness on ICT usage at Kilwa Road Police Hospital; and investigate the influence of management support on ICT usage in healthcare management systems at the hospital. The study was guided by the Technology Acceptance Model (TAM) and Resource-Based Theory (RBT) and employed a descriptive research design. Systematic sampling was used to select 162 respondents from a target population of 272 staff members. Data was collected through questionnaires and analysed using both descriptive and inferential statistics. Descriptive statistics included frequencies and percentages, while inferential statistics utilized multiple regression analysis. The findings reveal that the availability of necessary hardware and software is significantly and positively related to the effective utilization of ICT in healthcare management systems at Kilwa Road Police Hospital. Additionally, the level of staff awareness was identified as a crucial factor influencing ICT usage. The relationship between hardware and software availability and ICT utilization was statistically significant ($p < 0.05$), highlighting its importance in enhancing healthcare management systems. Furthermore, management support was found to play a significant role in ICT usage for healthcare management at Kilwa Road Police Hospital. The study concludes that ICT infrastructure, staff awareness, and management support are critical factors influencing ICT usage in healthcare management systems at Kilwa Road Police Hospital. It recommends that the hospital's management ensure the continuous availability of ICT infrastructure to sustain effective healthcare management systems.

Keywords: Health Management Information Systems, Electronic Health Record, Information and Communication Technology

I. INTRODUCTION

The integration of Information and Communication Technology (ICT) in healthcare, also known as e-health, has become a transformative force for improving the quality, accessibility, and efficiency of healthcare services globally (Muhanga & Haule, 2021). According to Gammersvik (2015) different countries around the world, have incorporated ICT usage in the health sector to improve service provision. For instance, in India the system was established in 2006, while in South Africa it started in 1998. In the USA, it is reported that the system has been in use since 1970s. In Canada, the country spends 1.1 billion US$ to maintain its electronic health information system and the same case is reported in England where the system was established in 2005 (Aminpour et al., 2014). As for Australia, the shift was observed in the 1990s and serious efforts were observed by the establishment of the National E-Health Transition Authority (NEHTA) (McInnes et al., 2006), to take care of the use of health information systems in hospitals. This shift has led to significant advancements in data management, record-keeping, and decision-making within the healthcare sector (Garavand et al., 2016). The widespread adoption of electronic health systems has bolstered health management information systems (HMIS), resulting in improved operational efficiency and strategic decision-making (Auyo et al., 2023). Notable ICT tools, such as electronic medical records (EMRs) and telemedicine, have revolutionized patient care by enhancing the accuracy, accessibility, and quality of healthcare services, particularly in underserved areas (Bujnowska-Fedak & Pirogowicz, 2019; Albarrak et al., 2021).

In Africa, several countries have made strides in integrating ICT into their health systems. Ghana's national health insurance scheme, Nigeria's health management information system, and Kenya's health information system are examples of how ICT is being used to enhance service delivery and healthcare data management in Africa (Asangansi & Braa, 2010; Opoku, 2020; Mutuku et al., 2017). These systems facilitate the sharing of information among healthcare

providers and improve access to health data, thereby supporting better decision-making and healthcare quality (Adatara, 2019; Ojo, 2021).

In Tanzania, efforts to adopt ICT in healthcare have faced challenges such as insufficient manpower, low staff awareness, and limited management support. The implementation of systems like the health management information system (HMIS) and the district health information system 2 (DHIS2) has been hindered by these issues (Kiberu et al., 2014). Nevertheless, the effectiveness of these technologies is influenced by several key factors within healthcare systems. Thus, addressing these challenges would require a comprehensive approach that considers both technological and human factors to enhance the effectiveness of healthcare services in the country (Hamad, 2019; Dwivedi et al., 2021; The Organization for Economic Cooperation and Development [OECD], 2017). Robust ICT infrastructure comprising hardware, software, and network systems is essential for the efficient storage and transmission of health information. Additionally, staff awareness and management support are crucial in ensuring that these tools are utilized effectively to maximize their impact on patient care (Malongo, 2019). Raising awareness among healthcare staff about the benefits and proper use of ICT tools is also crucial for successful implementation. Management support, through the provision of resources and fostering an innovative environment, also plays a significant role in the adoption of health information systems (Ahmadi et al., 2017; Mbugua & Namada, 2019). Therefore, this study aims to explore these factors in detail, offering insights that can help improve adoption, use, and efficiency of healthcare systems in Tanzania. Despite the implementation of systems like HMIS and DHIS2, there remains a significant gap in understanding the specific factors that influence their effective use, such as the root causes of insufficient manpower, the depth of low staff awareness, and the extent of management support. Addressing these gaps is crucial for optimizing the potential of ICT in enhancing healthcare service delivery in Tanzania.

1.1 Statement of the Problem

The development of ICT has revolutionized the way things are done all over the world. Such revolutions have been witnessed in business (Magoutas et al., 2024; Saif et al., 2022), to mention but a few. Despite the rapid growth of the ICT sector in Tanzania and the country's integration into the fourth industrial revolution, the effectiveness of ICT utilization in the health information system remains inadequate (Smith et al., 2018; Mussa & Maro, 2021). The health sector has witnessed the continuous use of paper-based information systems which hinders the quality, speed and accuracy of health-related services. Delay, inaccuracy and poor services in the health sector lead to increased effects of diseases which in most cases lead to the loss of people's lives with the most affected being children. Inadequacy in integration of ICT in the healthcare is partially attributed to inadequate ICT facilities, insufficient manpower, a poorly managed health systems, and lack of management commitment, along with limited access to ICT services in urban and rural areas, which highlight the need for improved integration (Kilwa Road Police Hospital Annual Report, 2022/23). Additionally, the absence of supportive policy guidelines and information strategies within the ministry of health further complicates data management and disease reporting (Hamad, 2019). Previous studies (Smith et al., 2018; Kimaro & Nhampossa, 2015; Betuel et al., 2017; Mboera et al., 2021; Mboera et al., 2001; Simba & Mwangu, 2006) focused on the use of health information systems for disease surveillance, health quality and users' experience with health information system and have identified a number of factors influencing the use of the system to include insufficient ICT infrastructure and weak governance as significant barriers. Regardless of the presence of such studies, there is a lack of focused research on the operational and strategic factors influencing ICT utilization in Tanzanian hospitals. This study investigated the operational and strategic factors affecting ICT utilization in public hospitals in Tanzania and specifically at Kilwa Road Police Hospital.

1.2 Research Questions

i. To what extent does infrastructure availability influence ICT usage in the healthcare management systems at Kilwa Road Police Hospital?
ii. What is the influence of the level of awareness among the staff on the ICT usage in the healthcare management systems at Kilwa Road Police Hospital?
iii. What is the influence of management support on the ICT usage in the healthcare management systems at Kilwa Road Police Hospital?

II. LITERATURE REVIEW

2.1 Theoretical Review

This study is informed by the Technology Acceptance Model (TAM) and Resource-Based Theory (RBT), as these theories collectively provide a comprehensive understanding of the factors influencing ICT utilization in healthcare management systems. The Technology Acceptance Model (TAM), developed by Davis, et al. (1989), posits

that technology adoption is influenced by individuals' perceived usefulness and perceived ease of use. It explains that actual technology use is indirectly determined by users' intentions, which are shaped by these perceptions (Davis et al., 1989). This model is pertinent to the study as it elucidates how perceptions of technology impact its adoption within healthcare settings, such as Kilwa Road Police Hospital (Luis, 2017). On the other hand, the Resource-Based Theory (RBT), developed by Barney (1991), emphasizes the importance of a firm's internal resources as a source of competitive advantage. The theory assumes that the organization owns a number of resources that can be useful in achieving its goals and maintaining its competitive edge. Such resources include tangible (assets, physical infrastructure, technology, employees) and intangible (knowledge, skills, organizational culture) which jointly can facilitate the success of the organization. It asserts that valuable, rare, inimitable, and non-substitutable resources—such as available infrastructure (ICT infrastructure including hardware, software etc), human capital equipped with knowledge and skills, and organizational support—are crucial for achieving and maintaining an advantage (Barney, 1991; Peteraf, 1993). RBT's focus on internal capabilities and resources complements TAM by addressing how organizational and technological resources impact the effective use of ICT in healthcare (Zhu et al., 2006; Hsu & Sabherwal, 2012).

2.2 Empirical Review

2.2.1 The Extent to which ICT Infrastructure Availability Influences ICT usage in Healthcare Management Systems

A study by Ahmadi et al. (2017) examined the role of ICT infrastructure in the adoption of hospital information systems (HIS) across 137 public hospitals in Malaysia. The findings indicated that advanced ICT infrastructure significantly influenced the successful implementation and use of HIS, highlighting the critical role of technological readiness in effective health information management. Similarly, Malongo (2019) investigated ICT integration in Kenyan public hospitals and found that modern hardware and software systems positively impacted hospital performance. This research underscores the importance of robust ICT infrastructure in improving operational efficiency and service delivery, reinforcing the need for well-established technological resources in healthcare settings. Moreover, a study by Simba (2004) conducted in the Tanzanian context shows a clear relationship between the presence if ICT infrastructure and the successful usage of health information systems in the county. A further study by Walker and Diana (2016) investigated the hospital adoption of health information technology to support public health infrastructure. In this study, the researcher revealed that because of inadequacy of ICT infrastructure, rural hospitals lag behind the normal use of health information systems. Thus, there is a direct relationship between ICT infrastructure and the usage of health information systems in hospitals. In another study by Lee et al. (2018) investigated the association between electronic medical records system adoption and healthcare information technology infrastructure revealed that there is a direct relationship between the availability of IT infrastructure and electronic medical records system.

2.2.2 The Influence of the Level of Awareness among Staff on ICT usage in Healthcare Management Systems

The impact of staff awareness on ICT usage was explored by Gholampour et al. (2020) in Iranian public hospitals. Their study revealed that increased staff awareness of hospital information systems (HIS) capabilities and benefits led to higher satisfaction and better system utilization. Barzekar et al. (2019) also highlighted the significance of staff awareness and training in their research on HIS adoption at Lorestan university of medical sciences. They found that informed and well-trained staff were more likely to embrace and effectively use HIS, emphasizing the importance of ongoing education and support for maximizing ICT benefits in healthcare environments. In the similar vein Oyelami et al. (2013) had earlier conducted a study to assess the awareness and usage of interned based health information for self-care in Nigeria. The study revealed users' awareness influences the use of internet -based health information systems. Suduc et al. (2010) investigated the user awareness and information system usability in Romaia. Findings revealed that users' awareness influence the usage of information system usability.

2.2.3 The Influence of Management Support on ICT usage in Healthcare Management Systems

Management support's influence on ICT adoption was demonstrated in Bawack and Kamdjoug's (2018) study of Health Information System (HIS) adoption in Cameroon. The research highlighted that managerial support, including resource provision, training facilitation, and commitment, were crucial for the successful adoption of HIS. Similarly, Mukred et al. (2020) found that management support and social influence significantly predicted healthcare providers' intentions to adopt new healthcare information systems in Yemen. Both studies align with the view that strong managerial backing is essential for fostering a supportive environment and overcoming resistance to change, which is crucial for effective ICT utilization in healthcare settings. Despite these insights, there remains a research gap in understanding how these factors specifically impact the adoption and effective use of ICT in healthcare systems within the Tanzanian context. There is limited evidence on how varying levels of management support and other contextual factors uniquely affect ICT adoption in Tanzanian healthcare settings, highlighting the need for further investigation

into these dynamics to better address and overcome local challenges.

III. METHODOLOGY

3.1 Research Design

This study used a quantitative approach with a descriptive research design to assess the influence of ICT usage in HIS at Kilwa road police hospital. The quantitative approach was used due to its power to report and predict the causation between variables (Creswell & Plano Clark, 2018). Because the study tries to determine the relationship existing between specific factors and HIS adoption, it was ideal for the researcher to use the approach.

3.2 Research Area

The research focused on Kilwa road police hospital in Dar es Salaam, chosen for its relevant ICT infrastructure and its role in the public health system. The hospital is located in Dar es salaam, Temeke Municipality. The hospital is a public hospital under the management of the Police Force. It provides services to both police officers and their families well as other citizen who seek medical attention from it.

3.3 Population Sample Size and Sampling Technique

The targeted population included medical doctors and nurses at the hospital. In total the hospital has 272 according to the available information from the human resources department. From this population, the researchers determined the sample size that was drawn from it. By employing the Yamane (1967) that allowed 95% of confidence level and 5% margin of error, the researchers drew 162 respondents from the entire population and these became the sample size that participated in the study. The sample selected by the researcher participated in the study by filling in the questionnaire provided. Systematic probability sampling was employed to select respondents from a list of hospital staff, with every second individual chosen to ensure representativeness. The approach helped to minimize all elements of biasness in selecting the sample size.

3.4 Data Collection

In this study, the researchers collected a single set of quantitative data. These data were collected via structured questionnaires using a five-point Likert scale. The questionnaire was composed of structured questions that intended to assess the factors influencing of infrastructure, awareness and management support on adoption and use of HIS at Kilwa road police hospital. The use of questionnaire allowed for the collection of data timely and to the required respondents. The researchers used to Drop on Pick Up (DOPU) approach in distributing and collection the questionnaire. The questionnaire was dropped to a certain respondents' table and was picked on the following day after being properly filled. Researchers distributed a total of 162 questionnaires which were all collected making it 100% return rate.

3.5 Data Analysis

Data analysis involved descriptive statistics to summarize sample demographics and multiple linear regression to explore the relationships between ICT usage and factors like infrastructure, awareness, and management support. Descriptive statistics provided a description of the findings through frequency and percentages. This was done w thorough cleaning and coding of the data which was done with the help of Statistical Package of social Sciences (SPSS). For the purpose of data reporting in this study, the Likert points 1 and 2 will be combined and regarded disagreement and 4 and 5 will be combined together and regarded as agree, while 3 will remain to be neutral. The regression analysis was used following the model created and after realizing that the data there in the study satisfies the regression assumptions of linearity, heteroskedasticity, multicollinearity, among others. The model is presented as

$$Y = \beta o + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + e$$

Where by

Y= ICT usage in health information system
βo = Constant factor
X_1 = ICT infrastructures
X_2 = Level of awareness
X_3 = Management support
e = Error term

IV. FINDINGS & DISCUSSION

4.1 Demographic Characteristics

The demographic characteristics of respondents involved age, sex and level of education which are displayed in Table 1.

Table 1

Demographic Characteristics of Respondents

Characteristics	Categories	Frequency	Percent (%)
Age	18-35 years	41	25.9
	36-50 years	81	51.3
	51-60 years	36	22.8
Sex	Male	117	74.1
	Female	41	25.9
Education	Certificate	22	13.9
	Diploma	19	12.0
	Degree	74	46.8
	Postgraduate	43	27.2
Total		158	100.0

4.1.1 Age of Respondents

Table 1 show that 41(25.9%) of respondents were aged between 18-35 years while 81 (51.3%) were aged between 36-50 years and the rest with 36(22.8%) were aged between 51-60 years. The data indicate that the majority of respondents were aged between 36-50 years. This suggest that younger respondents may exhibit higher levels of proficiency with ICT compared to older individuals. This proficiency can impact how effectively they utilize healthcare management systems that rely on technology.

4.1.2 Sex of Respondents

Table 1 show that 117(74.1%) of respondents were male while 41(25.9%) of respondents were female. In that regard, majority of respondents were male as compared to their female counterparts. This suggests that there are gender disparities in ICT use, with women often having less access to and proficiency in using technology compared to men. Understanding these differences is essential for designing inclusive and effective healthcare management systems that cater to the needs of all users.

4.1.3 Educational Level of Respondents

Data displayed in Table 1 indicates that 22(13.9%) of respondents attained certificate level of education while 19(12%) attained diploma level of education. Moreover 74(46.8%) of respondents attained degrees in different areas of specialization. On the other hand, the study indicated that, about 43(27.2%) of respondents attained postgraduate level of education. In that regard, majority of respondents attained adequate level of education. This suggest that higher levels of education are often associated with better understanding and adoption of new technologies. Respondents with higher levels of education may be more adept at using ICT tools and systems effectively in healthcare management. Those with higher levels of education are more receptive to training programs and have better ability to apply their knowledge to effectively use ICT solutions.

4.2 The influence of ICT Infrastructure Availability on ICT Usage in the Healthcare Management Systems at Kilwa Road Police Hospital

This was the first objective of the study, which sought to examine the extent to which ICT infrastructure availability influences ICT usage in the healthcare management systems at Kilwa road police hospital. To respond to the specific objective, about 158 respondents completed the questionnaire. Results are displayed in Table 2. Key: F – Frequency; % - Percentages;1 Strongly disagree, 2-Disagree, 3-Neutral, 4-Agree and 5-Strongly agree.

Table 2

Descriptive Statistics Regarding the Influence of Infrastructure Availability on ICT usage at KRPH

Variables	1		2		3		4		5	
	F	%	F	%	F	%	F	%	F	%
The current infrastructure in healthcare system adequately supports ICT usage	0	0	3	1.9	5	3.2	78	49.4	72	45.6
Availability of necessary hardware and software is consistent for effective ICT utilization	8	5.1	24	15.2	19	12	41	25.9	66	41.8
Technical resources, such as computers and network facilities, are easily accessible in our healthcare setup	4	2.5	3	1.9	35	22.2	47	29.7	69	43.7
The existing infrastructures contribute significantly to the efficiency of ICT usage in healthcare management systems	0	0	2	1.3	25	15.8	40	25.3	91	57.6
The infrastructure in our healthcare facility supports seamless integration and utilization of ICT	8	5.1	22	13.9	22	13.9	46	29.1	60	38.0

The respondents were asked whether the current infrastructure in healthcare system adequately supports ICT usage. The study revealed that the majority 150(95%) of respondents agreed that the current infrastructure in healthcare system adequately supports ICT usage. The findings suggest that Kilwa road police hospital is a modern healthcare facility that has invested in up-to-date technology such as electronic health records (EHRs), telemedicine, and other digital health solutions (Zeng & Paramanto, 2004) to enhance patient care and management. This digitization enabled easier storage, retrieval, and sharing of patient information, facilitating efficient ICT integration. Broadband internet access has become more widespread, even in remote areas, allowing healthcare facilities to connect to centralized systems, access cloud services, and communicate with patients and other providers seamlessly (Malongo, 2019). Moreover, the hospital has also implemented policies and procedures to ensure the effective integration of ICT into their daily operations.

The respondents were also asked whether the availability of necessary hardware and software is consistent for effective ICT utilization. The results show that the majority 107(67.7%) of the respondents agreed that the availability of necessary hardware and software is consistent for effective ICT utilization. This implies that the availability of hardware such as computers, servers, networking equipment, and medical devices is essential for the functioning of ICT systems in a hospital setting. These devices enable healthcare professionals to access electronic health records, medical imaging systems, and communication tools that facilitate collaboration and decision-making (Luis, 2017). On the other hand, specialized software applications are needed to manage patients' data, schedule appointments, track inventory, and support clinical decision-making(Mboera et al., 2021). Furthermore Addo and Agyepong (2020) added that the availability of ICT infrastructure play a vital role in health service delivery. Lack of ICT infrastructure could impede the impact of ICT in quality service delivery. Similarly electronic health record (EHR) systems, picture archiving and communication systems (PACS), and hospital information systems (HIS) are examples of software that are critical for efficient healthcare delivery (Mboera, et al., 2021).These findings are supported by Gholampour et al. (2020), who report that consistent access to hardware and software ensures that operations can run smoothly without interruptions or delays. Consistency in hardware and software availability enhanced productivity, as employees can focus on their tasks without being hindered by technical issues or the unavailability of essential tools. According to Luis (2017) and Malongo (2019), consistent access to the required hardware and software helps streamline processes that lead to increased efficiency.

Regarding technical resources including computers and network facilities, the study shows that most respondents 116(67.4%) agreed that resources, such as computers and network facilities, are easily accessible at Kilwa road police hospital. This implies that the integration of technology in healthcare has become essential for efficient patient care, medical record management, and communication among healthcare professionals. Through providing access to computers and network facilities, Kilwa road police hospital streamlines administrative tasks, improves communication between staff members, and enhances the overall quality of patient care. Also, the availability of computers and network facilities allows healthcare providers at Kilwa road police hospital to access electronic health records (EHRs) quickly and securely. EHRs contain vital information about patients' medical history, diagnoses, medications, and treatment plans (Luis, 2017). Moreover, the findings from Addo and Agyepong (2020) affirm the fact that without ICT infrastructure and network facilities, it is impossible to successfully adopt ICT resources in health care delivery. Thus, having easy access to this information enables healthcare professionals to make informed decisions promptly, leading to better patient outcomes.

With regards to whether existing infrastructures contribute to the efficiency of ICT usage in healthcare management systems, it was established that, majority of respondents 131(82.9%) agreed that the existing infrastructures contribute significantly to the efficiency of ICT usage in healthcare management systems. The findings suggest that

existing infrastructures such as data centers and storage facilities play a vital role in securely storing and managing vast amounts of patient data and medical records. This enables healthcare providers at Kilwa road police hospital to access critical information quickly when making clinical decisions. The availability of modern hardware devices such as computers, servers, and medical equipment, coupled with advanced software applications tailored for healthcare management, enhances the efficiency of ICT usage at Kilwa Road Police Hospital. These resources enable automation of tasks, electronic health record management, telemedicine services, and data analytics for improved decision-making.

These findings are supported by Mbugua and Namada (2019) who in their research reported that healthcare management systems relied heavily on various data sources, including patient records, medical imaging, laboratory results, and administrative data. Existing infrastructures provided the backbone for integrating these diverse data sources into a unified system, allowing healthcare providers to access comprehensive patient information quickly and efficiently. Interoperability is key to ensuring seamless communication and exchange of information between different healthcare systems and stakeholders, such as hospitals, clinics, laboratories, and pharmacies (Malongo,2019). Haroon et al. (2022) added that automation of healthcare system with supported infrastructure offers a great opportunity for improving healthcare system services and ultimately information on patients' health status by significantly improving human clinical capability for drug discovery, personalised medicine and operational efficiency. Thus, existing infrastructures support the development and implementation of interoperability standards, protocols, and interfaces, enabling disparate systems to work together effectively(Mbugua & Namada (2019).

The study revealed that the majority of respondents (67.1%) agreed that the infrastructure at Kilwa Road Police Hospital supports the seamless integration and utilization of ICT tools. This indicates that the hospital's existing network infrastructure is effective in ensuring reliable connectivity, which facilitates real-time communication between departments, healthcare providers, and patients. The study highlights the importance of efficient network infrastructure for the seamless operation of ICT systems in healthcare management. These findings are in line with those provided by Barzekar et al. (2019) which highlighted the importance of network connectivity in facilitating the sharing of information.

The findings are supported by the resource-based theory, which posits that the availability of resources in this case ICT infrastructure is a critical aspect in achieving the organization goals and objectives. In this case, the presence of ICT infrastructure facilitates the usage and provision of healthcare services to all that need them (Hsu & Sabherwal, 2012).

4.3 The Influence of the Level of Awareness among the Staff on ICT usage

This section addresses the second objective of the study, which sought to examine the influence of the level of awareness among the staff on the usage of ICT in healthcare management systems at Kilwa Road Police Hospital. To explore this, respondents were asked to grade their level of agreement or disagreement with five specific statements related to ICT awareness. The findings are presented in Table 3.

Table 3

Level of Awareness among the Staff on ICT usage

Variables	**1**		**2**		**3**		**4**		**5**	
	F	%	F	%	F	%	F	%	F	%
Members are well-informed about the benefits of ICT usage in healthcare management systems	0	0	2	1.3	8	5.1	75	47.5	73	46.2
There is a clear understanding among the staff regarding the various ICT tools available for use in healthcare management	8	5.1	24	15.2	19	12	46	29.1	61	38.6
Training programs have been effective in enhancing staff awareness about ICT usage in healthcare	2	1.3	0	0	37	23.4	52	32.9	67	42.4
Staff members are knowledgeable about the potential positive impact of ICT on healthcare service delivery	0	0	10	6.3	32	20.3	51	32.3	65	41.1
Level of awareness among the staff about ICT usage in healthcare management systems is high	0	0	5	3.2	21	13.3	33	20.9	99	62.7

The findings indicate that a significant portion of the respondents (93.7%) acknowledged that the staff at Kilwa road police hospital are well-informed about the benefits of ICT usage in healthcare management systems. This suggests that continuous training and education programs are essential in keeping the staff updated on ICT advancements, which in turn helps streamline processes, improve patient care, and enhance overall efficiency within the hospital. Moreover, the study reveals that a majority of the respondents (67.7%) agreed that there is a clear understanding among the staff regarding the various ICT tools available for use in healthcare management. This understanding is crucial as it enables

staff to optimize the use of ICT tools to improve patient outcomes, increase operational efficiency, and support evidence-based decision-making. Such knowledge also promotes interoperability and data sharing within the healthcare system, which is vital for enhancing care coordination and reducing medical errors. Additionally, 32.9% of the respondents agreed and 42.4% strongly agreed that training programs have been effective in enhancing staff awareness about ICT usage in healthcare. These programs not only equip staff with the necessary skills to effectively use ICT tools but also foster a culture of continuous learning and professional development. This investment in training is seen as a commitment by the hospital to keeping its employees up-to-date with the latest technological advancements in the field.

Furthermore, 73.4% of respondents supported the statement that staff members are knowledgeable about the potential positive impact of ICT on healthcare service delivery. This level of awareness is supported by the hospital's ongoing training initiatives and regular communication channels that keep staff informed about the benefits of ICT in their daily workflows (Nkanata et al., 2018). This is also in line with Nkanata et al. (2018) who expressed that awareness of hospital information management system among health workers is inevitable. Furthermore, the findings show that 83.6%of respondents agreed that the level of awareness among the staff on ICT usage in healthcare management systems is high. This high level of awareness is likely due to the hospital's dedicated IT department, which works closely with healthcare staff to ensure efficient and effective use of ICT technologies. These findings align with the literature, such as the study by Malongo (2019), which emphasizes the importance of training and education in enhancing staff awareness and competence in using ICT tools in healthcare. Similarly, Mukred et al. (2020) highlight that when staff members are well-versed in ICT tools, it leads to improved efficiency, better communication, and enhanced patient outcomes.

4.4 The Influence of Management Support on ICT Usage

This section addresses the third objective of the study, which aimed to investigate the influence of management support on the usage of ICT in healthcare management systems at Kilwa road police hospital. Respondents were asked to indicate their degree of agreement or disagreement with five statements related to management support. The findings are presented in Table 4.

Table 4

The Influence of Management Support on ICT usage

Variables	1		2		3		4		5	
	F	%	F	%	F	%	F	%	F	%
Management actively encourages and supports the integration of ICT in healthcare management systems	3	1.9	8	5.1	25	15.8	58	36.7	64	40.5
Adequate resources, including funding and personnel, are allocated by management for ICT implementation	8	5.1	22	13.9	29	18.4	51	32.3	48	30.4
Management provides timely and effective solutions to challenges faced in the utilization of ICT in healthcare management	3	1.9	9	5.7	22	13.9	81	51.3	43	27.2
Staff members perceive that management values and prioritizes the importance of ICT in healthcare operations	8	5.1	24	15.2	16	10.1	41	25.9	69	43.7
The support from management positively influences the successful usage of ICT in healthcare management systems	0	0	2	1.3	16	10.1	40	25.3	100	63.3

The findings displayed in Table 4 reveal that a significant proportion of respondents (77.2%) agreed that management actively encourages and supports the integration of ICT in healthcare management systems. This positive management support is critical in ensuring that staff have the necessary resources, including funding and personnel, to implement ICT effectively. This is more reflected in the study with 62.7% of respondents supporting the statement that adequate resources are allocated by management for ICT implementation. The findings also show that the management provides timely and effective solutions to challenges faced in the utilization of ICT. This statement was supported by majority of respondents (78.5%). This support is crucial for overcoming any obstacles that may hinder the successful integration of ICT in healthcare management systems.

Moreover, regarding on staff members' perception in how the management values and prioritizes the importance of ICT in healthcare operations, 69.6% of respondents support that the management gives ICT in the healthcare provision. This perception contributes to a positive organizational culture where ICT is seen as essential for achieving the hospital's goals (Mbugua & Namada, 2019). Also Thayananthan (2019) added that the management support in healthcare management using ICT and IoT was found significant which led to the customer satisfaction. Furthermore, the majority of respondents, 63.3%, strongly agreed that management support positively influences the successful usage of ICT in healthcare management systems. This finding underscores the importance of leadership in fostering an

environment that encourages the effective use of technology to enhance healthcare service delivery. These findings are consistent with the study by Mbugua and Namada (2019), who report that management support is crucial for the successful implementation and utilization of ICT in healthcare settings. The authors emphasize that when management is committed to ICT, it leads to better resource allocation, effective problem-solving, and improved overall healthcare delivery.

4.5 Regression Analysis of Factors Influencing ICT usage in Health Care Management Systems at Kilwa Road Police Hospital

4.5.1 Analysis of Variance (ANOVA)

This was done to determine the factor mostly influencing ICT usage in health care management system at Kilwa road police hospital. The findings obtained determined whether infrastructure availability, awareness among staff and management support the evaluated factors had a direct influence on ICT usage in health information system. Table 5 presents the results of an Analysis of Variance (ANOVA) for a regression model with the dependent variable being ICT usage in a health information system.

Table 5

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	100.681	3	33.560	994.054	.000[b]
	Residual	5.199	154	.034		
	Total	105.880	157			

a. Dependent Variable: ICT usage in health information system

b. Predictors: (Constant), Management Support, Awareness Among Staff, Infrastructure Availability

Findings from Table 5 indicate that the regression model is highly significant in explaining the variation in ICT usage in health information system based on the independent variables; management support, awareness among staff and infrastructure availability. The F- ratio of 994.054 and the p-value of 0.000 both suggest that the model is highly significant indicating that the variation in ICT usage in health information system is largely explained by the variations in these independent variables.

Overall, these results imply that enhancing management support, increasing staff awareness, and improving the availability of infrastructure can significantly boost the utilization of ICT in health information systems, highlighting areas for potential intervention and improvement in healthcare settings.

4.5.2 Coefficient

Table 6 presents the coefficients for a regression model with the dependent variable being ICT usage in health information systems.

Table 6

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-.041	.085		-.484	.629
	Infrastructure Availability	.572	.069	.567	8.349	.000
	Awareness Among Staff	.229	.043	.221	5.388	.000
	Management Support	.217	.057	.213	3.781	.000

a. Dependent Variable: ICT usage in health information system

Findings presented in Table 6 present a regression analysis conducted to determine the influence of each of the identified factors on Health Information system in Kilwa Road Police hospital. The regression determined the relationship between variables in this case Infrastructure availability, Awareness among staff, management support on ICT usage in Health Information system. In other words, how each of the factor influence the ICT usage in Health information system. Regarding Infrastructure availability, findings indicate that it has a coefficient of .572 translating to57.2% and a significant value of .000 ($p<0.05$). such findings indicate that the availability of ICT infrastructure greatly influence ICT usage in health information system. Such findings replicate those earlier presented by various scholars (Malongo, 2019; Luis, 2017; Mboera et al., 2021; Luis, 2017) who put it clear that the availability of hard and software, stable internet connectivity have been a catalyst to ICT usage in health information systems in different hospitals across

the world. Moreover, a study by Gholampour et al. (2020) report that the consistent availability of necessary hardware and software is crucial for effective ICT utilization. In the same vein, Barzekar et al. (2019) report that efficient use of the available infrastructure not only ensures reliable connectivity but also supports the integration of various ICT systems within healthcare settings.

Regarding awareness among staff, it was recorded to score a coefficient of .567 translating to 56.7%. This indicates that an increase in the staff awareness leads to an increase in 56.7% increase in the use of ICT in health information systems. Moreover, the variable had a significant value of .000 ($p<0.05$). Such findings indicate that the level of awareness among staff influences the level of usage of a technology. Findings relate to both TAM and RBV in which the former reports that easy technologies are easily adapted. The ease comes from learning and awareness and the latter capitalizes on staff skills being the intangible assets owned by the organization. In this regard, skills lead to awareness (Haroon et al., 2022).

In the same line, the relationship between management support and ICT usage I Health management system was assessed. Findings presented in Table 5 indicate that the variable had a coefficient of .229 translating to 22.9%. A unit change in the management support leads to 22.9% change in the ICT usage in health information systems. The variable also had a significant value of .001 ($p<0.05$). such findings indicate that management support and its presentation determine the ICT usage in the health information system. A supportive management leads to remarkable use and the unsupportive leads to minimal use. These findings echo those given by Mukred eta l. (2020) who while presenting the Yemeni Experience greatly highlighted the influence of management support on ICT usage in health information system. In the same vein, Bawack and Kamdjoug (2018) reported that although in Cameroon the positive effect was not observed, the reality shows that management support helps in provision of resources, training facilitation and demonstrating a sense of commitment.

V. CONCLUSIONS & RECOMMENDATIONS

5.1 Conclusions

This study investigated the factors influencing ICT usage in the health care management system at government hospitals in Tanzania with a case of Kilwa road police hospital. The findings indicate that the hospital's infrastructure, including hardware, software, and network facilities, significantly supports ICT usage and enhances healthcare delivery. The majority of respondents agreed that the current infrastructure adequately supports ICT systems, providing seamless integration and improving efficiency in healthcare management. This supports the Resource-Based Theory (RBT), suggesting that advanced ICT infrastructure is a critical resource that enhances ICT usage and improves overall healthcare outcomes.

5.2 Recommendations

The study's results have several implications for healthcare management and policy. First, the positive relationship between ICT infrastructure availability, staff awareness and management support underscores the importance of investing in modern technologies and maintaining consistent hardware and software resources. Healthcare facilities should prioritize upgrading and maintaining their ICT infrastructure to ensure seamless integration and efficiency in their operations.

Moreover, organizations should emphasize on meritocratic staffing and capitalize on the importance of periodic training to their staff. This improves the level of staff awareness and hence improves productivity. In the same sense, the management of hospitals have to be contingent by observing the trend in the advancement of science and technology and a shift from paper based to computerized hospital systems. Realizing this will facilitate them to support all efforts aiming at improving the usage of ICT in the healthcare information systems in the country.

Policymakers and hospital administrators should consider the findings to inform decisions related to healthcare technology investments and resource allocation, training as well as selecting right candidates in leading health facilities and large hospitals.

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