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The Influence Of Technological Factors On Implementation Of HMIS In Public Health Facilities In Galole Sub County, Tana River County, Kenya

By

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Abstract
The purpose of this study was to investigate the influence of technological factors on implementation of HMIS in public health facilities in Galole Sub-County, Tana River County, Kenya. Health Management Information System (HMIS) is one of the six pillars of health system building blocks, like any system, consists of supportive parts which are interrelated, interdependent and work towards a common objective. Document management and record keeping, financial services including mobile and card payments to achieve its full potential to reduce bureaucracy paperwork and enhance good service delivery. HMIS is described as the overall management of health information; it can be used to manage records and disease especially in public health. It is termed as a tool that can improve overall quality of healthcare system. The objective of the study is to assess the impact of technological elements on the execution of HMIS within public health facilities in Galole Sub county. The study utilized mixed-methods approach with a simple size of 145 from a sample population of 233 respondents. The sample included doctors, pharmacists, nurses, laboratory technologists, and records officers. Questionnaires and interviews were used to collect data which was analyzed using SPSS. The findings of the study demonstrated that availability of ICT hardware, the establishment of stringent policies and standards, and the implementation of efficient data storage systems were pivotal to the successful deployment of HMIS. ANOVA results highlighted significant differences in the impact of these technological elements, with the adequacy of ICT infrastructure ($F = 5.67$, $p < 0.05$) and the presence of robust policy frameworks ($F = 6.12$, $p < 0.05$) emerging as indispensable factors.The study decisively concluded that to revolutionize HMIS effectiveness, healthcare facilities must make substantial investments in technological infrastructure, formulate comprehensive policies, and execute extensive training programs. Addressing these critical elements was essential for enhancing healthcare delivery and patient outcomes in resource-constrained environments like Galole subcounty.

Keywords: Technological, Health, Management, Information Systems, health facilities

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1.0 Introduction

In the contemporary landscape of healthcare management, the utilization of Information Communication Technology (ICT) had become increasingly vital for enhancing the efficiency and efficacy of health systems worldwide according to Siddique,Tasleem, Ayesha Siddiqua, Salman Ahmad, & Ghaffar, . (2023). The caliber of health information generated substantially impacts the efficiency of a health system. Authentic, consistent, and up-to-date health data, along with other high-quality attributes, empower health administrators to make judicious decisions about resource distribution, facilitate the monitoring and evaluation of health initiatives, and enable comprehensive epidemiological tracking (World Health Organization [WHO], 2020).

Challenges in healthcare information systems (IS) are multifaceted, with data security and privacy standing as paramount concerns. Healthcare organizations handle highly sensitive patient data, making them prime targets for cyber-attacks and data breaches . Adhering to regulations such as the Health Insurance Portability and Accountability Act (HIPAA) requires robust security protocols, including encryption and secure data management practices. Despite these measures, the risk remains high, demanding continuous vigilance and adaptation to emerging cyber security threats. Ensuring the confidentiality, integrity, and availability of patient information is not only a technical necessity but also a legal and ethical imperative, which if not properly managed, can undermine patient trust and compliance with healthcare providers (Mosadeghrad, 2014) . Interoperability and data standardization present another significant hurdle in the effective use of healthcare IS. The integration of disparate systems often involves complex technical challenges due to the lack of uniform data formats and standards (Mugo & Nzuki, 2014). This issue not only hinders efficient data exchange across various healthcare systems but also affects the quality of data analysis, which is crucial for informed decision-making and patient care.

Without standardization, the potential of big data in healthcare to support disease tracking, population health management, and personalized medicine is significantly limited (Samhale, 2022). Efforts to promote common data standards and enhance interoperability among healthcare providers are essential for maximizing the utility and effectiveness of information systems in healthcare as per Kithinji A. K (2018) A functional health delivery system relies on thorough information analysis and data utilization to organize and monitor the progression of disease intervention activities (Chepkonga, 2015).

Wellness Care Administration Monitoring Technologies were developed to enhance everyday facility-based information management in numerous low- and middle-income nations, aiming to quantify health burdens, track trends, and identify any anomalies promptly for action.

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A study on information use and factors impacting the rollout of medical care data technology in Tanzania revealed that nearly all medical facilities (96.3%) organized sessions to address procedural and ethical constraints (Leonard et al., 2021). A substantial proportion (46.6%) of healthcare institutions confirmed regular scheduling of discussions, with a high percentage (92.2%) maintaining official documentation of these sessions. However, a majority (62.8%) lacked structured discussion plans when examined. Several sessions highlighted input-related challenges, including data clarity and completeness (57% of total) and discussions on commodity stock-outs (60%). A significant portion (79%) of decisions was made based on these dialogues. Over the previous three months, nearly half (49.1%) of the staff reported attending workshops organized by the district office to review HMIS data.

Statement of the Problem

In the realm of healthcare management, the effective implementation of Health Management Information Systems (HMIS) within public health facilities stood as a critical determinant of healthcare service delivery and patient outcomes. However, the successful execution of HMIS was depending upon various technological elements, including but not limited to infrastructure, software capabilities, and data management systems. In the context of Galole subcounty, a rural area grappling with healthcare resource constraints and burgeoning healthcare demands, understanding the impact of these technological factors on HMIS implementation was paramount for improving healthcare access and quality.

Despite the potential benefits of HMIS, numerous challenges hindered its optimal execution within public health facilities. These challenges included inadequate technological infrastructure, such as unreliable internet connectivity or outdated hardware, which could impede data collection, transmission, and storage processes. Additionally, issues related to software compatibility, usability, and training might hinder healthcare staff's ability to effectively utilize HMIS for decision-making and patient care. Furthermore, the lack of robust data management protocols and cybersecurity measures posed significant risks to the integrity and confidentiality of health information within HMIS.

The majority of the studies reviewed in this chapter have primarily tackled ICT broadly, rather than specifically focusing on Health Management Information Systems (HMIS). Furthermore, these studies have frequently explored various project types outside the public health domain. Although they generally consider factors affecting service delivery both internally and externally, this study hones in on HMIS implementation. Consequently, there is scant information on the factors influencing HMIS implementation in health service delivery. This research endeavors to bridge this void by identifying the factors affecting HMIS implementation in public health facilities in Galole Subcounty, Tana River County, Kenya.

Therefore, a comprehensive understanding of the impact of technological elements on HMIS execution in Galole subcounty was essential for identifying and addressing barriers to successful implementation.By elucidating these challenges, healthcare policymakers, administrators, and stakeholders could develop targeted strategies and interventions to optimize HMIS utilization, enhance healthcare service delivery, and ultimately improve health outcomes for the residents of Galole subcounty.

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Objective

To determine the influence of technological factors on implementation of HMIS in public health facilities in Galole subcounty

Research Question

How does technological factors influence HMIS implementation in public health facilities in Galole subcounty?

2.0 Literature Review

The "technology" stratum is the next crucial feature of "information systems," after the "information" core. In order to enable HMIS applications and use, a variety of information and computing-related technologies must be chosen and deployed. In this case, the hardware, software, and network component play a significant role. In a nutshell, this component entails setting up different hardware, software, user interface, and communication-enabling infrastructures, connected devices, and applications in order to connect people, groups, and organizations while achieving the most effective and efficient information services integration.. It would ultimately be imperative to make sure that any connected gadget could easily access the HMIS capabilities. Even better, these devices may access an application that has been specially tailored to fit their ecosystem.

The specific software vendor's hardware requirements vary greatly when it comes to executing EHR apps (Farzandipur et al., 2016). One tactic is to set up PCs or laptops in each patient room. Some doctors expressed worry about this approach because they believe it disrupts the doctor-patient relationship and gives the impression that the patient is not as interested in the doctor as they are in using the computer (Kyalo et al, 2016). Netbooks, convertible laptops, and portable electronics like iPads and other tablet PCs are among additional attractive hardware items. COWs, or computer on wheels, are a hardware needs approach used by certain healthcare providers. It is possible to move these COWs from one place to another. The option for doctors to access the EHR on their smartphone is another well-liked method. Popular smartphones such as the iPhone and Blackberry models are compatible with EHRs Hardware, as opposed to software, is a tangible object. Computer hardware and software are interdependent; without software, a computer's hardware would be useless. Software, however, would be meaningless without the development of hardware to carry out operations instructed by software via the central processing unit.

Hardware is only used for specially created, relatively easy-to-complete activities on its own. By putting algorithms (problem solutions) into practice, software enables computers to perform far more complicated tasks. Regardless of the software approach a healthcare organisation chooses, a well-organized rollout of the new EHR is essential.. Since end users are the program's primary users, it is crucial to include them in its customisation. To make sure the EHR system is operating as intended, testing is also crucial (Ames, et al., 2011).

Implementing the system too hastily can trigger billing issues and patient data issues (Ames et al.,2011). Another tactic for a successful EHR rollout is to thoroughly test the software before launching it. In addition, it is necessary to test every interface to guarantee that data is accurately moving between the various information systems. Training all end users on the new software applications is a good idea while the software is being ready for deployment. This contributes to the project's success and a more seamless go-live. Technology's operational characteristics include duration, since the average duration of a standard software installation procedure varies greatly.

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The typical implementation period for a strong integrated solution is between eleven and eighteen months.

According to Coulter and Magee (2017), the absence of an HMIS in numerous hospitals, including Hola County Referral Hospital, presents significant obstacles to achieving the required effectiveness and efficiency in service delivery. National policy making and resource allocation are recognised to be hampered by a lack of ability and advancements in the measurement and analysis of health information. HMIS suffers from inadequate funding and bad management in many nations.

The goal of Muinga et al.'s (2020) study was to evaluate the variables influencing the performance and integration of ICT/HMIS in the chosen public hospitals in Kenya. The results of the study showed that infrastructural agility, organisational information technology integration, and human-information technology integration all significantly improved the performance of Kenya's public hospitals. Marete (2018) completed work on how Kenya's healthcare system is affected by the use of electronic medical records from the standpoint of functional productivity.Their findings indicated that the most influential operational efficiency included the ICT infrastructure availability (hardware and software) availability of trained and adequate staff with the necessary skills and managerial support to implementation and installation of the ICT hardware.

In a nutshell one of the most significant transformative shifts in healthcare practice in recent history is about to occur in the healthcare sector. EHR innovations have the potential to improve healthcare. The healthcare sector will gain a great deal from the adoption of EHR technology and the installation of the necessary hardware, software, and IT infrastructure. Both patient quality and health outcomes will improve as a result. It can improve the financial performance of the healthcare facility and slant the rising national healthcare expense curve. Although the healthcare industry has been sluggish to implement EHR technologies, this will change as a result of government law enforcement. Making use of EHR technology to increase efficiency in an era where Medicare, Medicaid, and third-party payer payment are decreasing. Healthcare industry rely on whoever delivers the greatest IT and EHR systems to survive. influences the operational and financial success of healthcare organisations (Aguirre et al., 2019). Although there will always be challenges in the healthcare industry, the advancements in treatment and quality are encouraging. The healthcare sector's capacity to make EHR technologies a profitable endeavour will determine the direction of healthcare and the affordability of healthcare for Kenyans. A hypothetical system endeavors to articulate, by employing ideas or opinions, exactly phenomena are exactly how they are. It might be an established opinion about the basis of incidences. The Input process output (IPO) Demonstrate illustrates these phenomena of change of Information into Data.Input, translate, and item are the regular components of data framework forms, with a criticism interface between each.

As for input, one would expect that a health information system would be able to capture, assemble, or secure natural data.When it comes to information handling, we would expect that the data framework would be able to store or send information or output as well as change or alter crude information into some kind of usable output.

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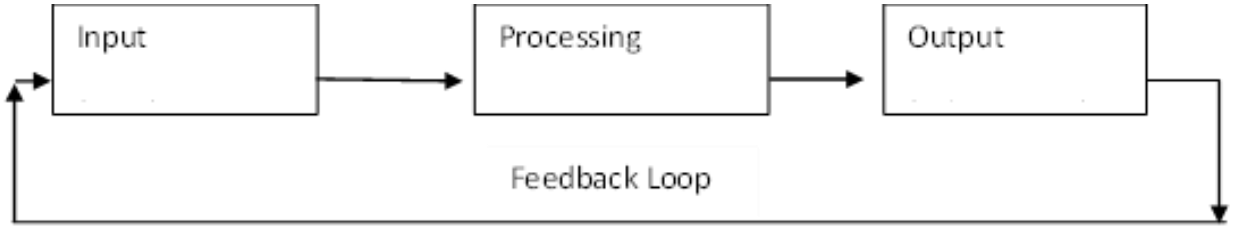
Figure 1: Theoretical Framework



Source: (Steiner et al, 1972)

The IPO Model offers a productive way to both analyse and report the basic viewpoints of a transformation process. Processing or control can incorporate performing calculations, making comparisons, picking elective activities, or simply storing information or future utilize. Output is characterized as the item created from data framework processes. Cases of Data Output incorporate: reports, records, outlines, cautions, and decision activities. It is critical that each data system have a feedback handle. Input can take the shape of evaluating yields of system processes and deciding whether or not alterations or changes to input or handling exercises are required. Criticism is utilized to impact future inputs to the system. The garbage in garbage out (GIGO) model also complements the IPO Model in that any data input to be process will yield its own products so the data we put in should be of good quality for it to have useful outputs. However, one of the demonstrate which is associated to innovation endorsement and utilization is the technology acceptance model (TAM) which was proposed by Davis in 1986. TAM has illustrated to be a hypothetical show has empowered clarification and expectation of client conduct of data innovation (Yoon, 2016). TAM is respected as an extension of theory of reasoned action (TRA). Ashraf, Narongsak and Seigyoung (2014), proposed TAM to explain why a client concurs to or disposes of data innovation by acclimatizing to TRA. TAM offers a establishment with which a individual follows the way outside factors influence the guideline, thought, and goals. Two cognitive standards are set by TAM. These are ease of utilize and clear convenience (Kyalo, Odhiambo-Otieno, Otieno, & Wanja, 2018)

3.0 Research Methodology

The purpose of the research design is to achieve greater control of variables, thus improving the validity in examination of the research problem. To explore interaction of the factors on HMIS implementation at public health facilities in Galole subcounty, the researcher therefore, employed cross sectional study plan utilizing blended strategies of both subjective and quantitative research design. Agreeing to Mugenda and Mugenda, subjective investigate determines and reports the way things are which this sort of investigate endeavors to portray such things as conceivable conduct, attitude, values and characteristics.

The target populations were the healthcare workers in Galole subcounty which was 233. The population comprised a mixture of all cadres of health workforce and the management. The study was carried out in Galole subcounty in Tana River County. There are 3 subcounties namely Garsen with 25 health facilities, Galole with 20 health facilities and Bura with 22 health facilities, a total of 67 public health facilities in the county with two level four public hospitals

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located in Galole and Garsen. Galole subcounty has 10 doctors, 92 nursing officers, 39 clinical officers, 2 public health officers, 6 radiographers, 10 pharmacists, 4 nutritionists, 10 physiotherapist, 18 lab technologists, 4 health record officers, 5 dental technologists, 31 community health advisors and 2 accounts officers. The medical superintendent, Health Record & Information Officers and the hospital Matron were the key informant interviewees.

A sample population of 145 was used in this study and it was calculated by using a target population of 233 medics with a 95% confidence level and an error of 0.05 using the formula below taken from Kothari (2004).

$$n = \frac{z^2.N.\partial_p^2}{(N-1)e^2 + z^2\partial_p^2}$$

Where: n = Size of the sample,
N = Size of the population and given 233
e = Acceptable error and given as 0.05,
∂p = The standard deviation of the population and given as 0.5 where not known,
Z = Standard variance at a confidence level given as 1.96 at 95% confidence level.
Pilot testing is putting of the investigate questions into test to a diverse study populace with comparable characteristics as the study populace to be examined Pilot testing of the investigate instruments was conducted utilizing staff at the Likoni sub county Hospital in Mombasa County since it incorporates a comparative setting with comparable characteristics of interest. Data was collected using interviews and questionnaires which was analyses using SPSS version 26. Ethical consideration was considered by ensuring anonymity, privacy, data security and acknowledging information sources by observing the APA 7th ed. Guidelines.

4.0 Results and Discussion

A response rate of 50% or higher is sufficient to analyze and report data (Mugenda & Mugenda, 2003). 89% of the 129 finished and returned surveys were acquired. Cronbach's alpha test was used to measure the reliability or internal consistency of the likert-type questions and a result of 0.70 or higher indicated that the scales were reliable. According to the findings, all of the likert scales had coefficients larger than 0.7, indicating that they were reliable in assessing the study's variables. Table 1 shows the findings.

HMIS Implementation

The implementation of HMIS was assessed based on three indicators including dissemination of information, timeliness of reports, and utilization of HMIS data, and the indicators were measured using 4, 2, and 6 likert-type statements/questions respectively. Respondents considered the extent of dissemination of information to be neither low nor great (*M* = 3.05, *SD* = 0.740, *CV* = 24.3%), the extent of timeliness of reports to be neither low nor great (*M* = 2.85, *SD* = 0.785, *CV* = 27.6%), and also the extent of utilization of HMIS data to be neither low nor great (*M* = 3.07, *SD* = 0.609, *CV* = 19.8%). In general, respondents considered the extent of HMIS implementation in public health facilities in Galole subcounty to be neither low nor great (*M* = 3.02, *SD* = 0.557, *CV* = 18.4%). The standard deviations of the aggregate responses were less than 30% of the means (*CV*<30%), indicating low variability as most of the aggregate responses were close to the mean. Table 2 presents the findings.

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Table 1: HMIS Implementation

Items	N	Min	Max	Mean	Std. Deviation	Coeff. of Variation (%)
There are mechanisms in place at county and sub county levels for supervision and feedback on information practices	129	1	5	3.09	1.097	35.5
statistical data are used to calculate coverage rates (e.g. for immunization) at sub county level	129	1	5	3.00	1.118	37.3
Does data reach relevant department for action	129	1	5	2.77	1.259	45.5
Availability of recent data and are widely distributed online or hardcopy	129	1	5	3.34	1.196	35.8
Dissemination of information				**3.05**	**.740**	**24.3**
There is a functional central HIS administrative unit which advocates for reports deadlines	129	1	5	2.84	1.022	36.0
Is there any feedback from monthly data submitted	129	1	5	2.85	1.281	44.9
Timeliness of reports				**2.85**	**.785**	**27.6**
Do you attend performance review meetings monthly and analyses your data?	129	1	5	3.40	1.176	34.6
Vertical reporting systems such as those for tuberculosis and vaccination communicate well with the general health service reporting system	129	1	5	2.85	.919	32.2
Display of HCW achievements of targets, population profile by table, graph or chart in service delivery unit	129	1	5	2.81	1.151	41.0
Are HCW able to analyse interpret and summarise their own data in their own service units	129	1	5	3.80	.971	25.6
HCW can conduct self-assessment review meetings as per the standard	129	1	5	2.74	.923	33.7
Data are disseminated and feedback given through regular publications on weekly, monthly or quarterly	129	1	5	2.80	1.271	45.4
Utilization of data				**3.07**	**.609**	**19.8**
HMIS Implementation				**3.02**	**.557**	**18.4**

Source: Field Data 2024

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Key informant interviewees were asked to indicate the status of HMIS implementation in public health facilities in Galole subcounty. Below are some of the responses provided"
Lack of involvement in HMIS operations impact negatively in HMIS implementation…There are no data sharing meetings for end users to consume their own data…Data utilization should be evaluated regularly by the responsible people monthly, quarterly biannually and annually. KII 2.
Analogue methods of data collection are still in place which may affect the accuracy of the data…Lack of knowledge on HMIS among HCW leads to poor data collection. KII 1

Technological Factors

The first objective of the study was to determine the influence of technological factors on implementation of HMIS in public health facilities in Galole subcounty. The technological factors considered in this study include availability of adequacy of ICT hardware, effectiveness of processes, and training on ICT, which were measured using 3, 3, and 1 likert-type statements/questions respectively. Respondents reported the extent of adequacy of ICT hardware to be low (M = 2.42, SD = 0.748, CV = 30.9%), the extent of effectiveness of processes to be low (M = 2.72, SD = 0.799, CV = 29.4%), and the extent of training on ICT to be low (M = 2.55, SD = 1.420, CV = 55.7%). However, the standard deviations for adequacy of ICT hardware and training on ICT were greater than 30% of the means (CV>30%), indicating high variability as most of the aggregate responses were spread out from the mean. In general, respondents considered the extent of adequacy of technological factors in public health facilities in Galole subcounty to be low (M = 2.57, SD = 0.671, CV = 26.1%). The standard deviation of the aggregate responses was less than 30% of the means (CV<30%), indicating low variability as most of the aggregate responses were close to the mean. Table 2 presents the findings.

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Table 2: Technological Factors

Item	N	Mini	Max	Mean	Std. Deviation	Coeff. of Variation
Adequate ICT hardware	129	1	5	2.20	1.208	54.9%
At least one computer specifically assigned for HMIS with internet services	129	1	4	2.45	.892	36.4%
There is stable ICT infrastructure to support running of the HMIS	129	1	5	2.61	1.207	46.2%
Adequacy of ICT Hardware				**2.42**	**.748**	**30.9%**
File conversion to all digital files is effective	129	1	5	2.41	1.101	45.7%
Adequate hardware and software evaluation is periodically done	129	1	5	3.33	1.219	36.6%
System testing is continually done to match employee tasks and HMIS functionality	129	1	4	2.41	.907	37.6%
Effectiveness of Processes				**2.72**	**.799**	**29.4%**
Healthcare workers received HMIS training at least once in-service training	129	1	5	2.55	1.420	55.7%
Training on ICT				**2.55**	**1.420**	**55.7%**
Technological Factors				**2.57**	**.671**	**26.1%**

Source: Field Data 2024

Key informants were asked to indicate how technological factors influence HMIS implementation in public health facilities in Galole subcounty. Below are some of the responses provided;

Lack of a technological system is a great setback in HMIS…Some data get lost on the process of collecting and management…Little to no system testing prevents effective implementation of HMIS. KII 1 adequate ICT hardware should be available, adequate policies and standards should be available, and HMIS data should be effectively stored and used in decision making

Provision of computers to all departments and training on HIS use can ease service delivery…You can easily trace the data...Training of end users is important in generating data. KII 3 this agrees with Nguefack Tsague et. al. who opines that HCWs training on health information, and presence of a performance evaluation plan and they concluded that training of health staff in the routine health information system (RHIS) favours RHIS good performance. Hence, emphasis should be laid on training and empowering staff, frequent and regular RHIS supervision, and frequent and regular feedback, for an efficient RHIS strengthening in Yaoundé

A stable ICT infrastructure helps safeguard health information…It helps in decreasing medical errors and operational costs…It enables all programme managers to access data of different departments KII 2. . EHR technologies stand to transform healthcare for the better. If EHR

technologies are embraced and the proper software, hardware and IT infrastructure are put in place, the healthcare industry stand to benefit greatly. It will increase patient quality and patient health outcomes

Correlation between Technological Factors and HMIS Implementation

A Pearson correlation coefficient was performed to evaluate the bivariate relationships between HMIS implementation and adequacy of ICT hardware, effectiveness of processes, and training on ICT. Discoveries showed a critical however moderate positive connection between sufficiency of ICT equipment and HMIS execution, r(127) = .425, p < .001. There was likewise a critical yet moderate positive connection between viability of cycles and HMIS execution, r(127) = .370, p < .001. Moreover, a huge however moderate positive connection between preparing on ICT and HMIS execution was laid out, r(127) = .303, p < .001. Table 4.5 presents the discoveries.

Table 3: Correlation Coefficients

		Enough ICT Hardware	Processes	Training on ICT	HMIS Implementation
Adequacy of ICT Hardware	Pearson Correlation	1			
	Sig. (2-tailed)				
	N	129			
Effectiveness of Processes	Pearson Correlation	.457**	1		
	Sig. (2-tailed)	.000			
	N	129	129		
Training on ICT	Pearson Correlation	.231**	.417**	1	
	Sig. (2-tailed)	.008	.000		
	N	129	129	129	
HMIS Implementation	Pearson Correlation	.425**	.370**	.303**	1
	Sig. (2-tailed)	.000	.000	.000	
	N	129	129	129	129

**. Correlation is significant at the 0.01 level (2-tailed).

Source: Field Data 2024

Regression of HMIS Implementation on Technological Factors

A multiple regression was run to predict HMIS implementation from adequacy of ICT hardware, effectiveness of processes, and training on ICT. This resulted in a significant model, R^2 = .242, $F(3,125) = 13.301$, $p < .001$. The individual predictors were examined further and indicated that adequacy of ICT hardware (t = 3.596, p < .001) was a significant predictor of HMIS implementation but, effectiveness of processes (t = 1.676, p = .096) and training on ICT (t = 1.917, p = .057) were not. Tables 4, 5, 6 and 7 presents the results.

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Table 4:Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.492[a]	.242	.224	.49056

a. Predictors: (Constant), Training on ICT, Adequacy of ICT Hardware, Effectiveness of Processes

Source: Field Data 2024

Table 5: *ANOVA*

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	9.603	3	3.201	13.301	.000[b]
	Residual	30.081	125	.241		
	Total	39.683	128			

a. Dependent Variable: HMIS Implementation

b. Predictors: (Constant), Training on ICT, Adequacy of ICT Hardware, Effectiveness of Processes

Source: Field Data 2024

Table 6: Regression Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	1.994	.175		11.419	.000	1.648	2.340
	Adequacy of ICT Hardware	.235	.065	.315	3.596	.000	.105	.364
	Effectiveness of Processes	.109	.065	.157	1.676	.096	-.020	.239
	Training on ICT	.065	.034	.164	1.917	.057	-.002	.131

a. Dependent Variable: HMIS Implementation

Table 7: Reliability Results

Variable	**N**	**Cronbach's Alpha**	**No. of Items**
HMIS Implementation	129	.821	12
Technological Factors	129	.777	7

Source: Field Data 2024

5.0 Summary, Conclusions And Recommendations

Technological factors on implementation of HMIS in public health facilities in Galole subcounty. The technological factors considered in the study included adequacy of ICT hardware, effectiveness of processes, and training on ICT. A multiple regression was run to predict HMIS implementation from adequate ICT hardware, effective processes, and training on

ICT. The results revealed that adequacy of ICT hardware was a significant predictor of HMIS implementation but, effectiveness of processes and training on ICT were not. A multiple regression was further run to predict HMIS implementation from technological factors, while controlling for human resource factors, managerial factors, and medical records. Results indicated that, adequacy of ICT hardware was a significant predictor of HMIS implementation in public health facilities in Galole subcounty while, effective processes and training on ICT were not.

The investigation conducted illustrates that the accessibility of satisfactory ICT equipment unequivocally predicts the deployment of HMIS in open wellbeing offices within the Galole sub-county. Nonetheless, HMIS deployment in free well-being amenities in the Galole sub-county is not significantly impacted by the efficiency of procedures or ICT training. Therefore, sufficient ICT equipments should be available to improve the effectiveness of HMIS installation in public health facilities in Galole sub-county.

Recommendation

The study prescribes that the authorities of Tana River County ought to guarantee that satisfactory ICT equipment is accessible to make strides of HMIS usage in open wellbeing offices in Galole sub-county.

Suggestions for Further Research

Future studies to be conducted in region ought to consider other variables not considered in this document in to pick up a broader understanding of components influencing HMIS usage in public well-being offices within the county. Comparable studies ought to moreover be conducted in other counties in Kenya in to form comparison additionally pick up a comprehensive understanding of components influencing HMIS usage over the counties in Kenya

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