Study of Utilization of Electronic Medical Records in Health Service Provision at the HIV Comprehensive Care Centers in Kiambu County, Kenya

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ABSTRACT

An electronic medical record system (EMR) is a digital record of health-related data for individual patients, maintained by authorized providers. Complete and timely information is crucial for informing public health decisions and improving health service delivery, particularly for HIV/AIDS. This study assessed the utilization of EMR systems in HIV comprehensive care centers in Kiambu County, Kenya. Specifically, it examined the association and predictive influence of infrastructure, technical factors, and perceived usefulness on EMR utilization. The research adopted a descriptive cross-sectional design and applied stratified random sampling to categorize 38 health facilities based on their level of care. A sample size of 186 participants was proportionally allocated to the various strata, and data was collected through questionnaires. Analysis using SPSS version 25.0 involved Chi-square tests to examine associations between variables and logistic regression analysis to assess predictive influences. The results revealed that infrastructure ($\chi^2=24.23$, $p<0.05$), technical factors ($\chi^2=62.93$, $p<0.05$), and perceived usefulness ($\chi^2=38.55$, $p<0.05$) had significant associations with EMR utilization and had positive predictive influences. The study concluded that upscaling EMR utilization in HIV care clinics requires a multifaceted approach. It recommended that the County Government of Kiambu implement comprehensive training programs for EMR users, increase funding for EMR infrastructure, strengthen routine maintenance of ICT equipment, and engage ICT staff at the facility level to provide on-site support and troubleshoot the systems.

Key Words: Electronic Medical Record, HIV/AIDS, Infrastructure, Technical Factors, Utilization.

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1. INTRODUCTION

The adoption and utilization of Electronic Medical Records (EMRs) have been a focal point in transforming healthcare delivery by providing real-time access to comprehensive patient data, thus enhancing the accuracy and efficiency of patient care. EMRs are integral in managing a wide array of patient information, including medical history, diagnoses, treatments, and laboratory results. This integration facilitates seamless healthcare delivery, reducing errors, and streamlining administrative processes [1]. In Austria, a study reported that while there was an increase in EMR deployment, many healthcare providers were slow to integrate these systems fully into their practice. About 74% of healthcare specialists acknowledged the benefits of EMRs, but significant challenges persist, including resistance to change, inadequate training, and insufficient infrastructure [2]. Despite the potential benefits and technological advancements, using EMRs, especially in resource-constrained settings like Kiambu County, Kenya, remains suboptimal. In Kenya, the Ministry of Health has been advocating for the widespread implementation of EMRs to improve healthcare delivery and patient outcomes, particularly for chronic conditions such as HIV/AIDS. However, the actual utilization of these systems remains inconsistent and limited, particularly in public health facilities. Kiambu County, with its high burden of HIV, represents a critical area where effective EMR utilization could significantly impact patient care and health outcomes. By the end of the year 2023, only 38 out of 77

Comprehensive Care Centers (CCCs) in Kiambu had installed EMRs. The 38 centers served 95% of the clients enrolled in HIV care. Despite this, the county's achievement in linking identified HIV-positive clients to care was only 77.8%, falling short of the UNAIDS 95-95-95 target according to KHIS, 2023. This gap indicates a substantial underutilization of EMRs, which could otherwise enhance patient tracking, reduce data duplication, and support comprehensive care management [3]. In Kenya, although a sizeable proportion of hospitals and clinics have accepted EMRs, the overall coverage and utilization remain low. For instance, despite the implementation of innovative e-health applications for managing HIV, many public hospitals still rely on paper-based records, which hinder effective patient tracking and data management. The current study aimed to fill this gap by assessing the factors influencing EMR utilization at CCCs in Kiambu County. It sought to understand whether these systems are being used effectively and if they added value to healthcare service delivery, particularly in the context of HIV/AIDS program implementation. The justification for this study lies in the critical role of EMRs in improving healthcare delivery and outcomes. High-quality data is essential for informed decision-making, monitoring patient progress, and designing evidence-based strategies. EMRs offer significant advantages, such as quick data retrieval, automated reporting, and enhanced adherence to treatment protocols, which are particularly beneficial for managing chronic diseases like HIV/AIDS [4]. However, the low utilization rates and the existing challenges in EMR implementation in Kiambu County highlight the need for a comprehensive assessment to identify and address the barriers to effective EMR utilization. Given the significant burden of HIV in Kiambu, investing in EMR utilization becomes a crucial strategy for supporting the care program, ensuring good outcomes and longer survival for clients. Thus, a need for the study to support evidence-based decisions toward optimizing the utilization of EMRs in Kiambu County.

2. LITERATURE SURVEY

Electronic Medical Records (EMRs) are widely recognized for their potential to enhance patient care quality, safety, and cost-effectiveness. However, despite these advantages, the utilization of EMRs remains relatively low in many healthcare settings. Understanding the factors influencing EMR utilization is crucial for successful implementation and scaling up in various regions, particularly in developing countries. Healthcare organizations are complex entities composed of people, values, norms, beliefs, and cultures, all of which are interconnected. Therefore, both social and technical aspects must be considered when assessing the operations and processes within these organizations. The introduction of Information and Communication Technology (ICT), such as EMRs, leads to significant organizational changes, including modifications in work structure and employee behavior. These changes require careful planning and consideration to ensure a positive impact on the organization [5]. In many low-income countries, healthcare organizations have adopted EMR systems at varying levels for reasons such as regional competition, fragmented health information systems, and the need for evidence-based health services. These factors must be addressed during the pre-implementation phase to facilitate the adoption and utilization of EMRs in developing countries. Globally, healthcare systems are transforming to improve access, quality of care, and patient involvement. EMRs are computerized legal medical records created by healthcare facilities and are essential components of health information systems. They enable the creation, storage, retrieval, and management of digital medical records, which is particularly valuable in HIV programming, where patient retention, appointment tracking, and alerts are critical. Governments worldwide have invested in the implementation of EMRs, recognizing their cost-effectiveness in various clinical settings. However, successful EMR utilization requires thoughtful planning, with users being actively involved in the process. Users demand functions that enhance their work, and their involvement in EMR planning, implementation, and workflow changes is crucial [6]. At the global level, the purposes and classifications of EMRs vary widely. Different EMR systems, such as HIV-EMR, hospital HMIS, pharmacy dispensing systems, and specialized EMRs for areas like pediatrics and psychiatry, are now common in the global market. In developing regions, particularly Sub-Saharan Africa, there is a growing need for ICT to improve healthcare. Over the past decade, internet access in Africa has significantly improved, facilitating the introduction of EMRs. However, challenges such as limited information on how healthcare is influenced by ICT and the need for extensive studies on EMR readiness and adoption persist [7]. In Kenya, EMR acceptance remains low. For example, at Moi Teaching and Referral Hospital, the EMR model primarily covers HIV therapy, and its utilization is often donor-controlled or disease-specific, limiting its full potential. The implementation of Health Information Systems (HIS), as outlined in Kenya's National Health System Strategic Plan (2020-2024), is expensive, requiring careful planning to maximize EMR benefits and minimize losses. The primary

goal of EMRs is to record basic patient identification information. According to the Kenya National eHealth Policy (2016-2030), EMR systems should support key functions such as providing demographic and clinical health information, including patient identity, contact details, and clinical data like medications, allergies, examination results, and vital signs. EMRs should also support clinical decision-making by flagging abnormal recordings and alerting providers to potential issues, such as drug interactions or allergies [8]. EMRs facilitate online requisition entry and e-prescribing, enabling healthcare workers to electronically enter instructions for patient care, manage prescriptions, and handle referrals. Additionally, EMRs support report generation and data sharing, enhancing the transmission and utilization of health information for quality assurance and feedback to stakeholders [9]. According to Kenya National eHealth Policy, 2016-2030), Data security, confidentiality, and integrity are critical components of EMRs. Regular data backups and adherence to best practices ensure the protection of patient information. EMRs also promote electronic knowledge interchange with other systems, such as laboratory and pharmacy systems, enabling system interoperability and the seamless exchange of patient information. The use of EMRs has been linked to improved compliance with quality indicators for HIV care and treatment, especially in resource-constrained settings. EMR-based Clinical Decision Support Systems (CDSS) have demonstrated positive impacts on healthcare quality, including improved diagnosis, reduced errors, and enhanced healthcare provider productivity [6]. The successful utilization of EMRs depends on the availability and customization of ICT software and hardware. However, interconnectivity issues and limited internet access remain significant obstacles to the widespread adoption of EMR systems, particularly in developing countries. For example, Denmark, with 83.9% broadband access per household, demonstrates higher EMR acceptance rates compared to countries with less reliable internet connectivity. Factors such as inadequate internet skills among healthcare workers, limited access to the internet, and insufficient infrastructure further hinder EMR adoption [10]. In Kenya, a study on infrastructural and technical obstacles to e-health adoption identified internet access as a critical factor for successful EMR implementation in healthcare settings. Addressing these infrastructural challenges is essential for advancing the utilization of EMRs and realizing their full potential in improving healthcare delivery [9]. HIV Comprehensive Care Centers (CCCs) face several unique challenges that influence Electronic Medical Records (EMR) utilization. Some of the factors include sensitive data and huge data at the CCCs, stigma and confidentiality, resource constraints, user training, availability of the ICT equipment, integration with existing systems, user attitude, management support, and motivation of the users. The use of innovations like the EMR is considered an effective and efficient strategy, which offers several benefits that enhance patient care and streamline healthcare processes. External and internal factors significantly impact the acceptance and utilization of information systems, including EMRs. These factors include system features, training levels, user involvement during planning, and utilization practices. Specifically, they influence the perceived usefulness and ease of use of the system, which, in turn, affects users' behavioral intentions. When healthcare workers actively contribute to the EMR implementation process, they appreciate the importance and the benefits associated with the utilization This positive engagement leads to better adoption and utilization of the EMR system, ultimately improving service delivery and health outcomes of the clients. In Kenya, there is scanty information that links the variables of the Technology Acceptance Model in the health context. Therefore, utilization factors such as ease of use, perceived usefulness, staff ICT knowledge, and staff attitudes have not been investigated in profundity. Hence, this presented a knowledge gap and the current study sought to investigate areas where there is no documented EMR utilization in the provision of health care services in HIV programming in the county of Kiambu.

3.   OBJECTIVE OF RESEARCH

The study aimed to assess the utilization of Electronic Medical Records among healthcare providers working at HIV comprehensive care clinics in Kiambu County, Kenya. The Specific objectives were:

   a)   To determine the proportion of the health providers utilizing EMR at the HIV CCCs in Kiambu County.

   b)   To assess the influence of infrastructure factors on the utilization of EMRs among health providers at the HIV CCCs in Kiambu County.

   c)   To determine technical factors influencing the utilization of EMRs among health providers at the HIV CCCs in Kiambu County.

   d)   To identify the influence of perceived usefulness on EMR utilization among health providers working at

the HIV CCCs in Kiambu County.

4. RESEARCH METHODOLOGY

This study used a descriptive cross-sectional research design. The design was meant to describe the respondents' views, attitudes, opinions, and the prevalence of the utilization of the EMR at that particular time among health workers working at the CCCs in the selected health facilities in Kiambu County, Kenya. The dependent variable assessed was the utilization of the EMR at the CCC and was measured as a categorical variable. The Independent variables included social demographic characteristics, infrastructure factors, technical factors, and perceived usefulness. This study was undertaken in sampled CCCs in Kiambu County, one of Kenya's 47 counties. The County was purposively sampled for the study due to the high prevalence of HIV/AIDS cases at 2.3% and is among the top ten counties contributing to 57% of the total Kenya HIV burden. The study targeted 360 healthcare workers working in the 38 comprehensive care clinics where EMRs are installed. The study applied a stratified random sampling technique. The health facilities were stratified according to the levels of care to improve the representativeness of different levels. This allowed proportional representation during the sample size determination. The sampling frame was 360 healthcare workers listed per facility. Using Krejcei and Morgan (1970), the sample size of 186 respondents was determined. The respondents to participate in the study were selected randomly at the facility level using a random number generator to pick the required respondents randomly. The researcher used self-administered questionnaires which were filled by the selected health professionals working at the CCCs to collect the data as guided by the study objectives. Data processing was executed using SPSS Version 25 and Microsoft Excel. Descriptive statistics that involved frequencies, proportions, and percentages were used to present the basic features of the data collected. Other data processing conducted included the Chi-square test and Logistic regression model analysis to determine the relationships and prediction between the variables under study.

5. RESULT AND DISCUSSION

5.1 Utilization of the EMR at the CCCs

Utilization was operationalized as uses of the EMR, last logging in, frequency of the logging, type of Patient data system currently in use, and EMR training. The outcome was measured as a binary variable wherein; utilization was classified as Yes or No. Findings showed that the majority (66.5%) of the health providers were utilizing the EMR as compared to 33.5% who were not.

A total of 496 responses were recorded. Capturing demographic data was the most frequent way of utilizing the EMR accounting for 20% of the total responses while the least was pharmacy function accounting for 1.4% of the responses.

Table 1 Uses of EMR

Uses of EMR		
Uses of the EMR	**Frequency**	**Percent (%)**
Capturing demographic data	99	20
Booking patients	86	17
Searching for files	77	16
Capturing and assessing clinical data	80	16
Checking results	50	10
Decision support	24	5
Order entry	25	5
Pharmacy	7	1
Counseling data	24	5
Others	24	5
Total	496	100

5.2 Period of EMR use

About 22.0% of the respondents had been using the EMR within one year and 19.2% had used it for five years and above.
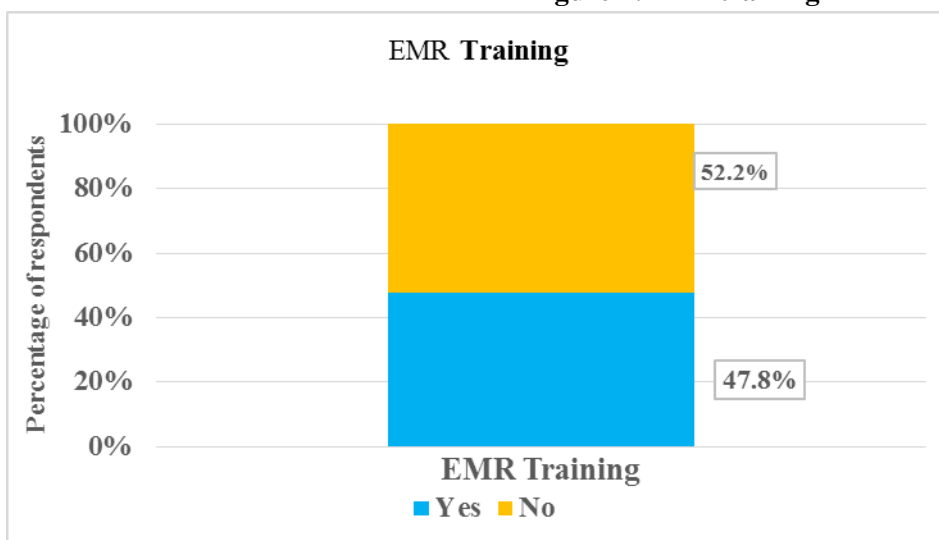
Figure 1: Period of EMR use
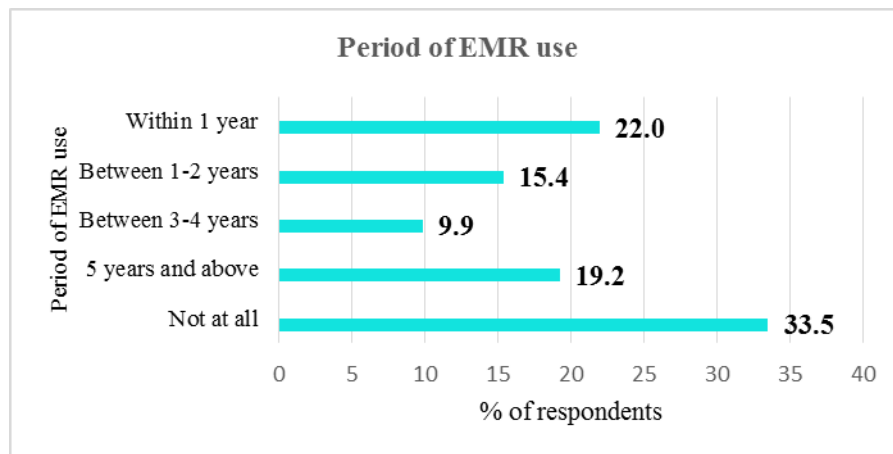
5.3 EMR training

More respondents (52.2%) had not received a form of EMR training while 47.8% had gone through an EMR training.
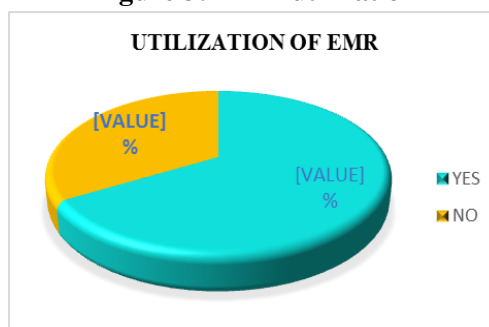
Figure 2:EMR training

5.4 EMR utilization

The majority (66.5%) of the health providers were utilizing the EMR as compared to 33.5% who were not

Figure 3: EMR utilization

5.5 Infrastructure Factors influencing the utilization of EMRs

Thirteen factors were studied, and four did not prove a statistically significant relationship while nine infrastructure factors showed a significant relationship.

Table 2 Influence of Infrastructure Factors on EMR Utilization

Infrastructure Factors		Utilization of EMR		CHI-SQUARE TEST		
		Yes	No	X^2	df	sig
Every day I have access to a computer	Disagree	21(17.35%)	16(26.23%)	31.201	2	0.024
	Uncertain	40(33.06%	10(16.39%)			
	Agree	60(49.59%)	35(57.38%)			
I have full access to a printer	Disagree	32(26.45%)	24(39.34%)	34.956	2	0.036
	Uncertain	40(33.06%)	19(31.15%)			
	Agree	49(40.50%)	18(29.51%)			
The computers have been networked	Disagree	23(19.01%)	30(49.18%)	22.945	2	0.047
	Uncertain	40(33.06%)	11(18.03%)			
	Agree	58(47.93%)	20(32.79%)			
The computers undergo regular maintenance	Disagree	33(27.27%)	20(32.79%)	6.158	2	0.002
	Uncertain	19(15.70%)	18(29.51%)			
	Agree	69(57.02%)	23(37.70%)			
The quality of computers available is satisfactory	Disagree	29(23.97%)	32(52.46%)	5.47	2	0.071
	Uncertain	21(17.36%)	7(11.48%)			
	Agree	71(58.68%)	22(36.07%)			
The number of computers available is satisfactory	Disagree	27(22.31%)	11(18.03%)	43.806	2	0.011
	Uncertain	23(19.01%)	9(14.75%)			
	Agree	71(58.68%)	41(67.21%)			
I always log in to the system using my credentials	Disagree	84(69.42%)	20(32.79%)	72.062	2	0.001
	Uncertain	6(4.96%)	6(9.84%)			
	Agree	31(25.62%)	35(57.38%)			
Faulty computers are repaired/replaced as per need	Disagree	47(38.84%)	21(34.43%)	52.425	2	0.001
	Uncertain	9(7.44%)	8(13.11%)			
	Agree	65(53.72%)	32(52.46%)			
I can use the computer available for other duties apart from the EMR.	Disagree	51(42.15%)	23(37.70%)	5.195	2	0.679
	Uncertain	11(9.09%)	7(11.48%)			
	Agree	59(48.76%)	31(50.82%)			
The source of power is reliable	Disagree	21(17.36%)	41(67.21%)	91.872	2	0.001
	Uncertain	13(10.74%)	8(13.11%)			
	Agree	87(71.90%)	13(21.31%)			
Navigation of the EMR system is user-friendly	Disagree	42(34.71%)	19(31.15%)	11.621	2	0.032
	Uncertain	13(10.74%)	11(18.83%			
	Agree	66(54.55%)	31(50.82%)			
Current EMR features are satisfactory	Disagree	58(47.93%)	23(37.70%)	9.893	2	0.064
	Uncertain	9(7.44%)	7(11.48%)			
	Agree	54(44.63%)	31(50.82%)			
The speed of the computers in use is satisfactory	Disagree	34(28.10%)	24(39.34%)	3.891	2	0.087
	Uncertain	23(19.01%)	8(13.11%)			
	Agree	64(52.89%)	29(47.54%)			

Effects of infrastructure factors on EMR utilization

Logistical regression was performed to ascertain the effect of infrastructure factors on the EMR utilization of EMR(Yes/No). The binary regression was adopted due to the outcome variable being binary i.e. Yes/No. The model was statistically significant with a chi-square (X^2 (df=26, N=182) =24.23, p=0.021). This indicates that the

infrastructure factors in the model have a significant effect on predicting EMR utilization. The Nagelkerke R Square, tells us the percentage of the variation in the response variables that can be explained by the independent variables. In this case, the infrastructure variables explained 76.6% of the variance in the utilization of EMR. This indicates strong evidence against the null hypothesis, suggesting that the infrastructure factors in this model have a significant effect on predicting EMR utilization. The predictors collectively contribute to explaining the variation in the dependent variable.

Table 3 Model Summary

Chi-square	df	Sig	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
24.23	26	0.021	38.7	0.471	0.766

5.6 Technical Factors influencing the utilization of EMRs

The study studies eleven technical factors. Based on the Chi-square tests, significant relationships were found between the utilization of EMR and five technical factors. These include, proficiency in Microsoft Word ($X^2(2$, n=182) = 36.422, p<0.05), satisfaction with IT technician support ($X^2(2$, n=182) =56.158 and a p<0.05), access to the EMR help desk ($X^2(2$,n =182)= 50.126, p<0.05), satisfaction with help desk response ($X^2 (2$, n =182) 6.741, p<0.005), and user-friendliness of EMR, ($X^2(2$, n=182) =18.098, p<0.05.

Table 4: Technical factors influence on utilization of the EMR.

Technical Factors		Utilization of EMR		CHI-SQUARE TEST		
		Yes	No	X^2	df	sig
I am proficient in the use of Microsoft Word	Disagree	30(24.79%)	40(65.57%)	36.422	2	0.021
	Uncertain	22(18.18%)	8(13.11%)			
	Agree	69(57.02)	13(21.31%			
I am proficient in using Microsoft Excel	Disagree	34(28.10%)	31(50.82%)	14.221	2	0.324
	Uncertain	27(22.31%)	15(24.59%)			
	Agree	60(49.59%)	15(24.59%)			
My typing abilities are excellent.	Disagree	23(19.01%)	31(21.31%)	12.759	2	0.065
	Uncertain	40(33.06%)	17(27.87%)			
	Agree	58(47.93%)	13(21.31%)			
The level of EMR initial training provided is satisfactory	Disagree	42(34.71%)	28(45.90%)	20.415	2	0.062
	Uncertain	19(15.70%)	12(19.67%)			
	Agree	60(49.59%)	21(34.43%)			
The availability of dedicated IT technicians for support is satisfactory	Disagree	23(19.01%)	26(42.62%)	56.158	2	0.032
	Uncertain	21(17.36%)	8(13.11%)			
	Agree	77(63.64%)	27(44.26%)			

I have access to the EMR help desk	Disagree	19(15.70%)	33(54.10%)	50.126	2	0.042
	Uncertain	28(23.14%)	13(21.31%)			
	Agree	74(61.16%)	15(24.59%)			
In-built-help model is helpful	Disagree	74(61.16%)	31(50.82%)	4.401	2	0.439
	Uncertain	11(9.09%)	9(14.74%)			
	Agree	36(29.75%)	21(34.43%)			
Response from the EMR help desk is satisfactory	Disagree	43(35.54%)	36((59.02%)	6.741	2	0.038
	Uncertain	7(5.79%)	5(8.20%)			
	Agree	71(58.68%)	20(32.79%)			
Regular updates of newer versions exist	Disagree	54(44.63%)	31(50.82%)	4.017	2	0.460
	Uncertain	14(11.57%)	10(16.39%)			
	Agree	53(43.80%)	20(32.79%)			
The EMR is User friendly	Disagree	29(23.97%)	29(47.54%)	18.098	2	0.0274
	Uncertain	11(9.09%)	8(13.11%)			
	Agree	81(66.84%)	24(39.34%)			
I have basic troubleshooting skills	Disagree	51(42.15%)	19(31.15%)	10.519	2	0.064
	Uncertain	16(13.22%)	11(18.03%)			
	Agree	54(44.63%)	31(50.82%)			

Effects of Technical Factors Affecting Utilization of EMRs

A logistical regression was performed to establish the effect of technical factors on the EMR Utilization (Yes/No). The binary regression was adopted due to the outcome variable being binary i.e. Yes/No. The model was statistically significant with a chi-square ($X2$ (df=32, N=182) =62.93, p=0.018). This shows that the technical factors in the model have a significant effect on predicting EMR utilization.

The Nagelkerke R Square, tells us the percentage of the variation in the response variables that can be explained by the independent variables. In this case, the technical factors explained 88.7% of the variance in the utilization of EMR. This shows strong evidence contrary to the null hypothesis, suggesting that the technical factors in this model have a significant effect on predicting EMR utilization. The predictors collectively contribute to explaining the variation in the dependent variable.

Table 5: Model Summary

Chi-square	df	Sig	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
62.93	32	0.018	27.001	.491	.887

5.7 Influence of perceived usefulness on EMR utilization.

Thirteen perceived usefulness factors were studied out of which seven perceived usefulness factors proved statistically significant while six did not prove a statistically significant relationship.

Table 6: Influence of Perceived Usefulness on the Utilization of EMRs.

Perceived Usefulness		Use of EMR		CHI-SQUARE TEST		
		Yes	No	X^2	df	sig
The use of EMR systems improves Data Accuracy	Disagree	14(11.57%)	24(39.34%)	5.661	2	0.044
	Uncertain	3(2.48%)	4(6.56%)			
	Agree	104(85.95%	33(54.10%)			
The use of EMR systems improves the Timeliness of data	Disagree	31(25.62%)	30(49.18%)	10.966	2	0.042
	Uncertain	13(10.74%)	9(14.75%)			
	Agree	77(63.64%)	22(36.07%)			
The use of EMR systems provides Reliable data	Disagree	29(23.97%)	29(47.54%)	3.054	2	0.065
	Uncertain	5(4.13%)	1(1.64%)			
	Agree	87(71.90%)	31(50.82%)			
The EMR system is easy to use	Disagree	63(52.07%)	37(60.66%)	1.537	2	0.738
	Uncertain	7(5.79%)	7(11.48%)			
	Agree	51(42.15%)	17(27.87%)			
The EMR system enhances Information retrieval	Disagree	61(50.41%)	31(50.82%)	31.005	2	0.032
	Uncertain	9(7.44%)	10(16.39%)			
	Agree	51(42.15%)	20(32.79%)			
The EMR system enhances the Legibility of clients' notes	Disagree	22(18.18%)	29(47.54%)	31.528	2	0.029
	Uncertain	8(6.61%)	9(14.75%)			
	Agree	91(75.21%)	23(37.70%)			
The EMR system reduces Clients' waiting time	Disagree	37(30.58%)	22(36.07%)	0.723	2	0.784
	Uncertain	20(16.53%)	13(21.31%)			
	Agree	64(52.89%)	26(42.62%)			
EMR is used as a reference to order supplies, medicine, and health products	Disagree	31(25.62%)	36(59.02%)	6.166	2	0.043
	Uncertain	26(21.49%)	11(18.08%)			
	Agree	64(52.89%)	14(22.95%)			
Referral of clients to different departments	Disagree	48(39.67%)	17(27.87%)	1.562	2	0.681
	Uncertain	22(18.18%)	13(21.31%)			
	Agree	51(42.15%)	31(50.82%)			
Using EMR I can always order relevant tests/give relevant support to the patient	Disagree	30(24.79%)	24(39.34%)	3.172	2	0.062
	Uncertain	25(20.66%)	9(14.75%)			
	Agree	66(54.55%)	28(45.90%)			
Raises prompts and reminders on key variables in HIV care and treatment programs.	Disagree	45(37.19%)	22(36.07%)	6.891	2	0.0385
	Uncertain	20(16.53%)	13(21.31%)			
	Agree	56(46.28%)	26(42.62%)			
Generation of quality pictorial data presentation i.e. Graphs, charts	Disagree	43(35.54)	31(50.82%)	2.823	2	0.545
	Uncertain	11(9.09%)	12(19.67%)			
	Agree	67(55.37%)	18(29.51%)			
I use the EMR to generate the required periodical reports i.e. MOH 731, missed appointments, and other standard reports	Disagree	51(42.15%)	29(47.54%)	16.604	2	0.028
	Uncertain	7(5.79%)	14(22.95%)			
	Agree	63(52.07%)	18(29.51%)			

Effects of Perceived Usefulness and Utilization of EMRs

Logistical regression was performed to establish the effect of perceived usefulness factors on EMR Utilization (Yes/No). The binary regression was adopted due to the outcome variable being binary i.e. Yes/No. The model was statistically significant with a chi-square (X^2 (df=16, N=182) =38.55, p=0.001). This shows that the perceived usefulness factors in the model have a significant effect on predicting EMR utilization.

The Nagelkerke R Square, tells us the percentage of the variation in the response variables that can be explained by the independent variables. In this case, the technical factors explained 90.1% of the variance in the utilization of EMR. This shows strong evidence contrary to the null hypothesis, suggesting that the perceived usefulness factors in this model have a significant effect on predicting EMR utilization. The predictors collectively contribute to explaining the variation in the dependent variable.

Table 7 Model Summary

Chi-square	df	Sig	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
38.55	16	.001	24.376	.533	.901

6. CONCLUSION

According to the study findings, 66.5% of healthcare workers working at CCCs utilized the EMRs. However, complex capabilities like clinical decision modules and pharmacy are used sparingly. Thus, a greater emphasis on the use of the EMR was noted in data management tasks as compared to advanced clinical management. In addition, the majority of the respondents preferred a hybrid system where they used EMR and paper interchangeably. This means that there is still a preference for paper records or there are limitations to the EMR. It is noted that a significant proportion of users had not received any form of EMR training despite a high utilization rate. The study demonstrates a strong positive relationship between infrastructure factors and EMR utilization. It is such an important aspect in the acceptance and utilization of EMR systems in healthcare institutions that healthcare organizations should ensure that the appropriate infrastructure is in place before implementing any EMR system. It is critical to emphasize that infrastructure cannot boost utilization on its own; therefore, other known predictive factors must be addressed. As a result of this study, we conclude that infrastructure factors are a strong predictor of EMR utilization. The study demonstrates a positive association between technical factors and EMR utilization, with technical factors being identified as a significant predictor of EMR utilization. The findings suggest that technical factors such as ease of use, user training, technical support, and troubleshooting skills are crucial in EMR implementation and utilization. In conclusion, technical factors play a pivotal role in EMR utilization. Influence of perceived usefulness on the utilization of the EMR

The findings of the study suggest that perceived usefulness is an important factor in the utilization of EMRs. There was a strong positive relationship that was scientifically significant. Therefore, the study concludes that perceived usefulness is a positive predictor of EMR utilization.

In summary, given the p-values were less than 0.05 in the logistical analysis model for the three independent variables (infrastructure factors, technical factors, and perceived usefulness), I reject the null hypothesis and conclude that there is a significant relationship between the dependent and the independent variables being studied.

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