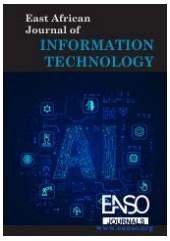

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Original Article

Determinants of Point-of-Care Technology Use among Health Care Workers in Comprehensive Care Centres, A Case of Central Kenya

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ABSTRACT

The Point of Care (POC) approach is the highest level of interaction between health care workers (HCW) and the information system, which generally requires interaction during clinical meetings. Although it is hard to do so, it offers the most significant benefits. The POC strategy offers the system's benefits to healthcare workers, patients, and those who monitor and evaluate them. The study focused on identifying key determinants of point-of-care technology use among healthcare workers offering services in comprehensive care centres in Central Kenya. A Cross-sectional descriptive study was adopted, two-stage cluster sampling design method was used in determining the sample size. The study involved a sample size of 217 respondents and over a 100% was achieved. The study results revealed that social demographic factors of health care workers have no significant influence on POC technology use as a p-value of above 0.05 was observed on all the variables. Some organisational factors such as adequate workstations ($p = 0.0$) and EMR reducing patient time ($p = 0.012$) were found to have significant influence on POC technology use. Significant influence on POC use was noted on source of funding for software and hardware maintenance ($p = 0.001$). The utilisation of EMR to review client progress in real-time ($p = 0.001$) was found to have a significant influence on POC technology use as well as the use of EMR to report to the national reporting system (KHIS) ($p = 0.014$). 71% of respondents reported that availability of clinical decision support features in the EMR was contributing to improved use of POC. An overwhelming 72% reported that they were very motivated to use POC technology due to the ability of auto generating reports. In addition, three factors were highlighted as key contributors to the success of POC use, and these were reliable power supply (44%), adequate and trained healthcare workers (24%), standard and stable EMR Systems (17%). The study recommended for adequate training of health care workers, adequate workstations, and reliable power supply. For initial implementers of EMRs, they should consider having Standard EMRs that support both clinical decision support features and automated reporting.

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INTRODUCTION

The Point of Care (POC) approach is the uppermost communication level among health care workers (HCW) and the information system, which requires interaction during clinical meetings in general. Although it is hard to do so, it offers the most incredible benefits. "Through the system, its patients, and the monitoring and evaluation staff, the POC approach benefits the health care worker" (Lewis et al., 2010).

Health Information Systems (HIS), including EMR systems, promise to facilitate improvement in health care. This potential is recognised in many African sub-Saharan countries, including mobile healthcare, electronic records of health, and risk monitoring systems, and their successful use of eHealth technology. Although some developed countries have demonstrated leadership by substantial investment in recent generations of health information systems **(**Jawhari et al., 2016**).** The aim is to improve the use and deployment of information and communication technology for the Kenya data management within the context of Strategic Objective Five of the HIS strategic plan for 2009-2014. This purpose is aligned with the need for structured and interoperable ICT applications, including EMRs. The Ministries of Health are initiating the standardisation of EMRs in Kenya through HIS in this sense (MOH, 2010).

Ministry of Health in collaboration with implementing partners has provided for computing hardware, EMR development, and deployment, and has ensured continuous capacity building of health care providers on EMR system use for optimal realisation of Point-of-care benefits in the comprehensive care centres. At the health care facilities, the Point-of-care approach use is aimed at supporting patient care management; clinical decision support features as well as reporting from the lowest level of healthcare to the national level.

METHODS

A Cross-sectional descriptive study was adopted for this study. The population size of the study was 500. Fischer et al. 1999 formula of sample size determination was applied to determine the sample size. 217 was used as the sample size and to control for non-response, a 10% adjustment was made to 239. Multi-stage cluster sampling design method was used in determining the sample; the population was grouped into Counties, all Tier 3 and above EMR sites from each County were selected while system users at selected sites were selected using probability proportional to population size.

The data collection tool used was a questionnaire consisting of open-ended and closed-ended questions. The structured questionnaire was administered face to face to the EMR system users

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on each selected study site. The data collected from the structured questionnaire was then coded, entered, and analysed using descriptive statistics and Inferential statistics to determine association with the aid of R software.

RESULTS

Socio-Demographic Factors Influence on Point-of-Care Technology Use

The results indicated that majority of the respondents were aged between 18 to 35 years at 85%, 63% were females, 99% had tertiary education level, 44% had proficient computer skills and Health Records and Information Officers were the most responders at 44%. The proportion of respondents who reported utilisation of Point-of-care technology did not differ from those who used retrospective EMR by Age, $X^2_{(1, 225)} = 0$, $p = 1$; by sex, $X^2_{(1, 225)} = 0.507$, $p = 0.466$, by education level, $p = 0.317$; by computer skills, $X^2_{(1, 225)} = 0.038$, $p = 0.981$; by profession, $p = 0.070$; and by county $X^2_{(1, 225)} = 1.589$, $p = 0.791$. The following table presents the results:

Table 1: Socio-demographic factors

Variable		Mode of EMR Use				χ2	df	P - value
		POC		Retrospective				
		n	%	n	%			
Age	18- 35 Years	158	83	33	17	0.00	1	1
	36+ Years	28	82	6	18			
Sex	Female	114	81	27	19	0.507	1	0.466
	Male	71	86	12	14			
Education Level	College, University	185	83	38	17			0.317*
	Secondary School	1	50	1	50			
Computer Skills	Basic	78	82	17	18	0.038	2	0.981
	Expert	25	83	5	17			
	Proficient	83	83	17	17			
Profession	Clinical Officer	60	91	6	9			0.070*
	HRIO	76	76	24	24			
	HTS Provider	6	75	2	25			
	NURSE	13	81	3	19			
	Pharmacy Technologist	5	100	0	0			
	Social Worker	13	76	4	24			
	Other	13	100	0	0			
County	Kiambu	44	81	10	19	1.585	4	0.791
	Kirinyaga	19	76	6	24			
	Murang'a	44	85	8	15			
	Nyandarua	29	81	7	19			
	Nyeri	50	86	8	14			

**Fischer's exact reported*

Organisational, Technical, and Financial Factors Influence on Point-of-Care Technology Use

Organisational Factors

Workload: 68% of the respondents reported that the workload was manageable, 8% reported that the workload was overwhelming while 24% reported that the workload was slightly overwhelming. Power: The findings indicate that 98% of the sites rely on electricity as the main power source with only 2% with generator. Only 25% (28/111) unique sites reported to have an alternative power supply.

The proportion of respondents who reported utilisation of Point-of-care technology did not differ from those who used retrospective EMR by workload levels, $X^2_{(2, 225)} = 1.796$, $p = 0.473$; by data entry time, $X^2_{(2, 225)} = 2.614$, $p = 0.271$, by EMR easing workload, $p = 0.158$; by main power source, $p = 0.582$; and by power outage $X^2_{(2, 225)} =$

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1.170, p = 0.279. The proportion of respondents who reported utilisation of Point-of-care technology differed from those who used retrospective EMR by adequacy of workstations, $X^2_{(2,\ 225)}$ = 9.194, p = 0.01; by EMR reducing patient time, X^2 (2, n=225) = 8.908, p = 0.012; and by alternative power source $X^2_{(2,\ 225)}$ = 16.426, p = 0.001.

Table 2: Analysis of organisational factors

Variable		Mode of EMR use				χ2	df	p-value
		POC		Retrospective				
		n	%	n	%			
Workload Levels	Manageable	123	80	30	20			
	Overwhelming	17	89	2	11			
	Slightly overwhelming	46	87	7	13			
Effect of workload on data entry time	Agree	76	80	19	20	2.614	2	0.271
	Disagree	61	77	18	23			
	Neutral	41	80	10	20			
Adequacy of workstations	Agree	18	85	117	15	9.194	2	0.01
	Disagree	53	72	21	28			
	Neutral	26	76	8	24			
EMR helps in easing workload	Agree	160	80	40	20			0.1581*
	Disagree	6	55	5	45			
	Neutral	12	86	2	14			
EMR reduces patient time	Agree	139	82	30	18	8.908	2	0.012
	Disagree	15	62	9	38			
	Neutral	24	75	8	25			
Main power source	Electricity	174	79	47	21			0.5822*
	Generator	4	100	0	0			
Alternative power source	No	66	63	38	37	16.426	2	0.001
	Yes	112	93	9	7			
Power outage	No	105	81	25	19	1.170	2	0.279
	Yes	73	77	22	23			

**Fischer's exact reported*

Financial Factors

Findings indicated that 92% of system/security enhancement funding was from donor while 6 % was from the government of Kenya. On hardware and software maintenance 91% reported that the funding was from donor and only 8% came from the government of Kenya. Findings on budget allocation for EMR maintenance: 60% reported that there was no budget allocation, 10% reported there was a budget allocation while 29% did not know if there was a budget allocation.

The proportion of respondents who reported utilisation of Point-of-care technology did not differ from those who used retrospective EMR by Source of financing for system and security enhancement, p = 0.125; by Budget allocation at facility level, p = 0.435. The proportion of respondents who reported utilisation of Point-of-care technology differed from those who used retrospective EMR by Source of financing for software and hardware, p = 0.

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Table 3: Analysis of financial factors

Variable		Mode of EMR use				χ2	df	P - value
		POC		Retrospective				
		n	%	n	%			
Source of financing for system and security enhancement	Don't know	1	17	5	83			0.125*
	Donor funds	174	84	32	16			
	Government of Kenya funds	11	83	2	17			
Source of financing for software and hardware maintenance	Both Donor and facility investment	1	100	0	0			0.001*
	Don't know	0	0	1	100			
	Donor funds	167	82	37	18			
	Government of Kenya funds	16	83	3	17			
Budget allocation at facility level	I do not know	56	85	10	15			0.435*
	No	109	80	27	20			
	Yes	21	91	2	9			

**Fischer's exact*

Technical Factors

Findings on respondents who received training on EMR use at the Initial Phase by training type: 72% of the respondents reported to have received a training while 28% reported that they did not receive training on the initial phase. 67% of the respondents were trained via On-job training, 20% through on-site mentorship, and 12% were trained through a formal training.

Findings on the satisfaction levels with training received: of the respondents trained, 52% reported that the training was comprehensive, 42% reported that it was somewhat comprehensive while 6% reported that the training was not sufficient. The proportion of respondents who reported utilisation of Point-of-care technology did not differ from those who used retrospective EMR by Trained/oriented/mentored on EMR use, $X^2_{(1, 225)} = 0.817$, $p = 0.817$.

Table 4: Analysis of technical factors

Variable		Mode of EMR use				χ2	df	P -value
		POC		Retrospective				
		n	%	n	%			
Trained/oriented/mentored on EMR use	Yes	132	82	29	18	0.054	1	0.817
	No	54	84	10	16			

Influence of Inbuilt Clinical Decisions Support Features Utilisation on Point-Of-Care Technology Use

The findings on inbuilt clinical decision support feature utilisation on point-of-care technology use were as follows: 43% of respondents agreed that the EMR TB program is consistent with the patient workflow, 40% were neutral while 40% disagreed. 42% agreed on consistency of MCH program, 38% disagreed while 20% remained neutral. 94% strongly agreed on the CCC program consistency, 4% disagreed while 2% were neutral. 60% agreed on the consistency of HTS Program area, 23% disagreed while 17% were neutral.

Table 5: Program areas consistency

Variable	Agree	Neutral	Disagree	Total
TB	97 (43%)	89 (40%)	90 (40%)	225 (100%)
MCH	93 (42%)	46 (20%)	86 (38%)	225 (100%)
CCC	211 (94%)	5 (2%)	9 (4%)	225 (100%)
HTS	134 (60%)	38 (17%)	53 (23%)	225 (100%)

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Findings on data Migration and visit summaries status: 85% respondents reported that data migration is complete, 9% reported that migration was not complete while 6% were not certain of the migration completeness. 94% of the respondents reported that visit summaries were up to date, 4% reported that the visit summaries were not up to date while 3% were not certain on visit summaries status.

Table 6: Migration and visit summary

Variable	Maybe	No	Yes	Total
Data migration completeness	14 (6%)	20 (9%)	191 (85%)	225 (100%)
Visit summary completeness	6 (3%)	8 (4%)	211 (94%)	225 (100%)

Findings on EMR patient overview availability and its utilisation by the clinicians: 95% of the respondents reported that the EMR supports patient overview while 5% reported that it does not support. Of those who reported that the EMR supports patient overview, 50% reported that clinicians utilise the overview in real time to review client progress, 23% very often, 21% sometimes, and 3% of the respondents reported that clinicians never or rarely utilise the patient overview.

Table 7: Patient overview availability

Variable	Always	Never	Rarely	Sometimes	Very Often	NA	Total
No	0 (0%)	0 (0%)	0 (0%)	0 (NA%)	0 (0%)	11	11 (5%)
Yes	108 (50%)	6 (3%)	6 (3%)	45 (21%)	49 (23%)	0	214 (95%)
Total	108 (50%)	6 (3%)	6 (3%)	45 (21%)	49 (23%)	11	225 (100%)

Findings on other factors observed: 96% agreed that EMR supports quick access to patient information, 96% agreed that the EMR supports clinical decision features, 93% were positive about EMR supporting appointment management, 94% agreed that EMR supports data for decision making, 90% agreed to the fact that EMR helps in improving quality of care offered and 71% were positive that clinical decision support features influence use of EMR.

Table 8: Other clinical decision support (CDS) features

Factor	Agree	Neutral	Disagree	Total
Quick access to patient information	215 (96%)	8 (3%)	2 (1%)	225 (100%)
Clinical decision support features	217 (96%)	6 (3%)	2 (1%)	225 (100%)
Appointment management	210 (93%)	11 (5%)	4 (2%	225 (100%)
Data for Decision making	211 (94%)	9 (4%)	5 (2%)	225 (100%)
EMR Improving Quality of Care	203 (90%)	18 (8%)	4 (2%)	225 (100%)
Clinical Decision support features influence EMR use	160 (71%)	11 (5%)	54 (24%)	225 (100%)

The proportion of respondents who reported utilisation of Point-of-care technology did not differ from those who used retrospective EMR by *EMR support to patient overview, $p = 0.219$; by quick access to* information, $p = 0.310$; by Clinical decision support, $p = 0.364$; by Managing appointments, $p = 0.276$; by Data for decision making, $p = 1$; by Improving quality of care, $p = 0.192$, and by Clinical decision support features contributing to improved EMR, $p = 0.401$.

The proportion of respondents who reported utilisation of Point-of-care technology differed from those who used retrospective EMR by Utilising EMR to review client progress, $p = 0.001$.

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Table 9: Analysis of CDS features

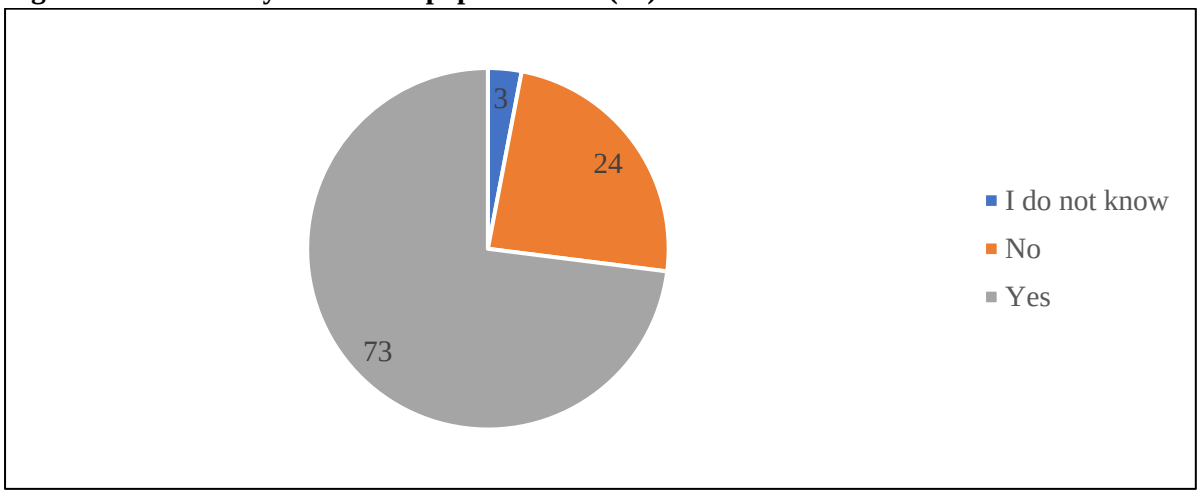
Variable		Mode of EMR use				χ2	df	p-value
		POC		Retrospective				
		n	%	n	%			
EMR support to patient overview	No	11	100	0	0			0.219*
	Yes	175	82	39	18			
Utilising EMR to review client progress	Always	132	84	25	16			0.001*
	Never	2	33	4	67			
	Sometimes	34	67	17	33			
Quick access to information	Agree	179	83	36	17			0.310*
	Disagree	1	50	1	50			
	Neutral	6	75	2	25			
Clinical decision support	Agree	180	83	37	17			0.364*
	Disagree	1	50	1	50			
	Neutral	5	83	1	17			
Mangaing appointments	Agree	172	82	38	18			0.276*
	Disagree	3	75	1	25			
	Neutral	11	100	0	0			
Data for decision making	Agree	174	82	37	18			1*
	Disagree	4	80	1	20			
	Neutral	8	89	1	11			
Improving the quality of care	Agree	168	83	35	17			0.192*
	Disagree	2	50	2	50			
	Neutral	16	89	2	11			
Clinical decision support features contributing to improved EMR use	Agree	121	81	31	19			0.401*
	Disagree	48	89	6	11			
	Neutral	9	82	2	18			

**Fischer's exact reported*

Influence of Accuracy and Consistency in Automated Indicator Reporting on Point-of-Care Technology Use

Findings on the ability of EMR to capture all data variables in paper records: 73% respondents reported that EMR was capturing all data in paper forms, 24% reported that EMR was not capturing all data while 3% did not know if it was capturing or not.

Figure 1: Consistency of EMR vs paper records (%)



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Findings on EMR Use in KHIS reporting in the last three months (Jan, Feb, March 2021): 86% of respondents reported that EMR was used to report in KHIS for the last three months, 73% of which were from POC use, 9% reported that they did not use EMR to report to KHIS while 5% were neutral.

Table 10: Reporting to KHIS from EMR

Reporting to KHIS from EMR	POC	Retrospective data entry	Total
Yes	163 (73%)	30 (13%)	193 (86%)
No	18 (8%)	3 (1%)	21 (9%)
I do not know	6 (3%)	6 (3%)	12 (5%)
Total	186 (83%)	39 (17%)	225 (100%)

Findings on whether the EMR has eased the reporting process: 45% strongly agreed, 47% agreed, 1 respondent (0.4%) strongly disagreed, 2% disagreed, and 6% were neutral.

Table 11: EMR Easing Reporting

Variable	POC	Retrospective data entry	Total
Agree	172 (76%)	37(16%)	209 (93%)
Neutral	8 (4%)	3 (1%)	11 (5%)
Disagree	3 (1%)	2 (1%)	5 (2%)
Total	183 (81%)	42 (19%)	225 (100%)

Findings on the motivation levels by the ability to report using EMR: 72% of respondents reported that they are very motivated, 27% somewhat motivated while 1% were not at all motivated.

Table 12: Motivation to use EMR.

Variable	POC	Retrospective data entry	Total
Very motivated	130 (58%)	32 (14%)	162 (72%)
Somewhat motivated	55 (24%)	6 (3%)	61 (27%)
Not at all motivated	1 (0.4%)	1 (0.4%)	2 (1%)
Total	186 (83%)	39 (17%)	225 (100%)

The proportion of respondents who reported utilisation of Point-of-care technology did not differ from those who used retrospective EMR by data completeness, $p = 0.221$; by up-to-date Patient visit summaries, $p = 0.850$; by auto-generating reports, a motivating factor to EMR use, $p = 0.080$. The proportion of respondents who reported utilisation of Point-of-care technology differed from those who used retrospective EMR by reporting to DHIS from EMR, $p = 0.016$.

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Table 13: Analysis of reporting

Variable		Mode of EMR use				χ2	df	p-value
		POC		Retrospective				
		n	%	n	%			
Data completeness	Maybe	13	93	1	7			0.221*
	No	19	95	1	5			
	Yes	154	81	37	19			
Up to date Patient visit summaries	Maybe	6	100	0	0			0.850*
	No	7	88	1	12			
	Yes	173	82	38	18			
Reporting to DHIS from EMR	I do not know	6	50	6	50			0.016*
	No	18	86	3	14			
	Yes	162	84	30	16			
Auto-generating reports, a motivating factor for EMR use	Not at all motivated	1	50	1	50			0.080*
	Somewhat motivated	55	90	6	10			
	Very motivated	130	80	32	20			

**Fischer's exact reported*

DISCUSSION

The results of this study have revealed key information that could be leveraged while making decisions on Electronic Medical Records Systems. Facts established by this research could be useful to National and Sub-National governments in ways they can improve the adoption of EMRs in Health care facilities. It is evident from the results that there's a positive attitude among healthcare providers who expressed their preferred mode of EMR use as a Point-of-care model.

Socio-Demographic Factors and Point-of-Care Technology Use

The findings of this study were closely compared with those of a study in Malawi which demonstrated that most respondents aged 21 to 30 years used EMRs more than paper-based records (Msiska et al., 2017). The results of several previous studies indicate that younger healthcare workers have used EMRs in more ways than older healthcare professionals (Al-azmi et al., 2009).

These results agree with a previous study which revealed that tertiary education health workers had used almost the same amounts of EMRs and paper-related records. "More often than paper records, most data clerks (n = 27/36; 75.0%) used EMRs" (Msiska et al., 2017).

Like other studies, Socio-demographic factors have no significant association with EMR utilisation; hence these factors should not be a hindrance to EMR implementations. There was no significant influence observed on demographic factors, as all factors observed had a p-value of >0.05.

Organisational, Technical, and Financial Factors Influence on Point-of-Care Technology Use

The results indicated that most respondents reported that they had adequate infrastructure and personnel, which disagrees with a study conducted by Essuman et al. (2020, p364) who found that "Institutional factors including lack of general IT infrastructure, cost of EMR resources and facilities, and maintenance, lack of technical personnel, lack of reliable EMR software and inadequate internet bandwidth, and security challenges with the privacy of patients' data were significantly associated with EMR utilisation."

The results indicate that EMR has helped ease the reporting process, which goes against the study conducted by Laerum and Faxvaag (2004), who in his study noted that many physicians report that using EMRs will lead to taking more time while attending to each patient as opposed to using a file-based system as, in some situations, it might

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be more convenient and efficient to use paper records during the clinical encounter.

The results further indicated that only 25% (28/111) of the selected sites had an alternative power source. This can be interpreted to mean that point-of-care use would be interrupted following a fault in the electricity supply. "The vast majority of health facilities in developing countries tend to have no mains power and where available, such power is extremely unreliable or unstable, which may likely pose a threat to unprotected electronic equipment" (Isemeck et al., 2019, p77).

The findings revealed overreliance on donor funding for infrastructure, security enhancement, hardware, and software maintenance. This is a threat to sustainability since the EMR implementing sites are not budgeting for hardware or software maintenance, and this may lead to non-use of these systems if donor funding is withdrawn. EMR implementation is a costly affair and requires all stakeholders to take part in support at all levels. These findings are in line with a publication made by Boonstra & Broekhuis (2010, p4), which indicated that "In addition to the start-up costs, implementing an EMR system requires an extensive commitment to system administration, control, maintenance, and support to keep it working effectively and efficiently." The source of financing for software and hardware maintenance, $p = 0$, was noted to have a significant influence on PoC use.

Findings revealed that computer literacy is not a major barrier to EMR adoption as most respondents are computer literate, which goes against the study conducted by Meade et al. (2009), which found that physicians have little knowledge of the technic and skills to deal with EMRs and that this leads to resistance. Meade et al. (2009) also noted that the newer generation of physicians in Ireland received their professional qualifications before the introduction of IT programs, unlike the case in this generation, as revealed by the results. These findings also go against a study conducted by Loomis et al. (2002), which found that two-thirds of physicians indicated a lack of technical support as a barrier to them adopting EMRs. There was no significant influence noted on technical factors observed (Trained/oriented/mentored on EMR use, X^2 (1, n=225) = 0.817, p = 0.817).

Influence of Inbuilt Clinical Decisions Support Features Utilisation on Point-Of-Care Technology Use

The results indicate 85% data migration completeness, they further indicated 94% visit summaries up to date, which could be interpreted to mean that the EMR system has both legacy and current records updated.

These results on EMR supporting quick access to patient information negates the study by Boonstra & Broekhuis (2010, p. 10) that found that "Many physicians report that sometimes it is more efficient and convenient to use file-based records during the clinical encounter with the patients because using EMR systems will take more time for each patient. This could be an indication that over time the clinicians are changing their perspective on EMR use, and many of them are tech-savvy."

It was interesting to observe an overwhelming percentage of respondents agreeing with the fact that EMR supports clinical decision features. Inbuilt clinical decision features are important in guiding clinical decisions, which in turn leads to improvement of care offered to the clients. EMR supports the improvement of quality care, EMR supports appointment management and data for decision-making. These findings are an indication that healthcare workers are motivated to use the EMR system by the availability of the inbuilt clinical decision features. A significant influence on POC use was observed on Utilising EMR to review client progress, p = 0.001, while no significant influence was noted on other variables observed.

Accuracy and Consistency in Automated Indicator Reporting Influence on Point-of-Care Technology Use

The study results indicated most respondents (73%) were confident that EMR captures all data,

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while 24% were not confident that EMR captures all the data. These findings are close to what Msukwa reported in 2013, that 22% of clinicians were not confident in EMRs because the information and results collected using the EMR system were said to be incomplete and inaccurate. Similarly, the results negate Alharthi et al. (2015), who found that physicians were concerned with the accuracy and completeness of information recorded in EMR systems.

With most respondents reporting the use of EMR to report to the National reporting system, this is an indication that with optimum use of the EMR System in all facilities, automated indicator reporting is possible. As Thompson's findings (1999) study suggest that data files from EMRs are feasible and useful for automating and integrating knowledge structures. The automatic approach improves the thoroughness and accuracy of predictor data files. The results further confirm that automatic monitoring lowers the burden of the facility's human capital by eliminating time-consuming, labour-intensive, and human error from manual information feedback.

It was exciting to note that the majority of respondents were motivated by the ability of EMR to auto-generate reports. This could form one of the things to enhance for anyone planning to implement EMR. Significant influence on PoC use was observed on reporting to DHIS from EMR, $p = 0.016$, while no influence was noted on other variables observed.

CONCLUSION

Based on the objectives and the findings of the study, the following conclusions can be made: Full adoption of point-of-care technology use requires that all healthcare providers, regardless of their age and gender, are conversant with the system used to ensure continuity and sustainability. Lack of a reliable/stable power source translates to service interruption whenever there is a power outage hence making it difficult to sustain a point-of-care mode of EMR Use. It is therefore a key factor to consider while transitioning a site from paper to paperless implementation. To ensure sustainability, the Ministry of Health through the County governments should allocate funding towards software development and hardware maintenance to ensure sustainability should the donor funding cease. The utilisation of EMR to review client progress in real-time has influence on point-of-care use, and this should be factored in while designing an EMR system since it is likely to boost the uptake of the EMR system. EMR system can generate quality reports that can be used to report to the national reporting system (KHIS); hence all stakeholders should support the point-of-care technology use as this will help address the reporting gaps associated with manual reporting hence ensuring the availability of quality data to guide informed decisions. All EMR systems should be standardised and be in line with the nationally accepted electronic medical records standard.

Recommendations

Considering the findings of the study, the researcher proposes the following for policy and planning. The Ministry of Health through the County governments, in collaboration with service delivery partners, should ensure that: All healthcare workers are capacity built to enhance their computer skills and EMR System navigation so that they eventually take part in point-of-care technology use. Doctor-patient ratio is maintained; this will prevent staff from getting overwhelmed by the workload hence providing quality care to the clients while still implementing point-of-care technology. All health facilities have adequate computing hardware capable of supporting the facility workload and covering all workstations to support point-of-care technology use at all service delivery points and ensure that there's allocation of a maintenance budget. All health facilities have a reliable power supply, which is stable enough to support point-of-care technology use without interruption. Alternative power sources that are less expensive can be explored, such as the Solar system. All health facilities embrace point-of-care technology use as this will help address the reporting gaps

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associated with manual reporting and allow automated reporting to the National reporting system (KHIS) hence ensuring the availability of quality data to guide informed decisions. EMR Systems deployed at health facilities are standard and have the capabilities to offer the features stipulated in the Standards and Guidelines for Electronic Medical Record Systems in Kenya, such as inbuilt clinical decision features and reporting. As a follow-up of this study, it would be great to conduct a study that evaluates the effectiveness of point-of-care technology use in improving the quality of care as compared to a non-EMR site.

REFERENCES

Al-Azmi SF, Al-enezi N, Chowdhury I. Users' attitudes to an electronic medical record system and its correlates: a multivariate analysis. *Heal Inf Manag J*. 2009;38(2)

Alharthi, H., Youssef, A., Radwan, S., Al-Muallim, S., & Zainab, A. T. (2014). Physician satisfaction with electronic medical records in a major Saudi Government hospital. *Journal of Taibah University Medical Sciences*, *9*(3), 213-218.

Boonstra, A., & Broekhuis, M. (2010). Barriers to the acceptance of electronic medical records by physicians from systematic review to taxonomy and interventions. *BMC health services research*, *10*(1), 4-10.

Essuman, L. R., Apaak, D., Ansah, E. W., Sambah, F., Ansah, J. E., Opare, M., & Ahinkorah, B. O. (2020). Factors Influencing the Utilization of Electronic Medical Records in the Eastern Region of Ghana. *Health Policy and Technology*, *9*.

Fernando, Susantha & Bandara, Thushari. (2015). Barriers for Implementation of Electronic Medical Record (EMR): A Review. Barriers for Implementation of Electronic Medical Record (EMR): A Review. Vol 2 (1) 210-214.

Isemeck, C. S., Ngure, K., Kariuki, M. J., & Muchene, M. O. (2019). Factors influencing the adoption of electronic health records in public health facilities in Kisumu County, Kenya. *Journal of Health, Medicine, and Nursing*, *4*(1), 74-101.

Jawhari, B., Ludwick, D., Keenan, L. *et al.* Benefits and challenges of EMR implementations in low resource settings: a state-of-the-art review. *BMC Med Inform Decis Mak* **16**, 116 (2016). https://doi.org/10.1186/s12911-016-0354-8

Lærum, H., & Faxvaag, A. (2004). Task-oriented evaluation of electronic medical records systems: development and validation of a questionnaire for physicians. *BMC medical informatics and decision making*, *4*(1), 1-16.

Lewis, Z. L., Mello-Thoms, C., Visweswaran, S., & Crowley, R. S. (2010). Using Electronic Medical Records to Measure Guideline Adherence in Low-Resource Settings.

Loomis, G. A., Ries, J. S., Saywell, R. M., & Thakker, N. R. (2002). If electronic medical records are so great, why aren't family physicians using them?. *Journal of Family Practice*, *51*(7), 636-641.

Meade, B., Buckley, D., & Boland, M. (2009). What factors affect the use of electronic patient records by Irish GPs?. *International journal of medical informatics*, *78*(8), 551-558.

Ministry of Health Kenya, 2010. http://guidelines.health.go.ke/#/category/26/41/meta

Msiska, K. E. M., Kumitawa, A., & Kumwenda, B. (2017). Factors affecting the utilisation of electronic medical records system in Malawian central hospitals. *Malawi Medical Journal*, *29*(3), 247-253.

Msukwa, M. K. (2011). User perceptions on electronic medical record system (EMR) in Malawi. *Unpublished Master's Thesis. University Of Malawi College of Medicine*.

Thompson, I. M. (1999). Automated entry of nosocomial infection surveillance data: use of an optical scanning system. *Journal of Hospital Infection*, *43*, S275-S278.

