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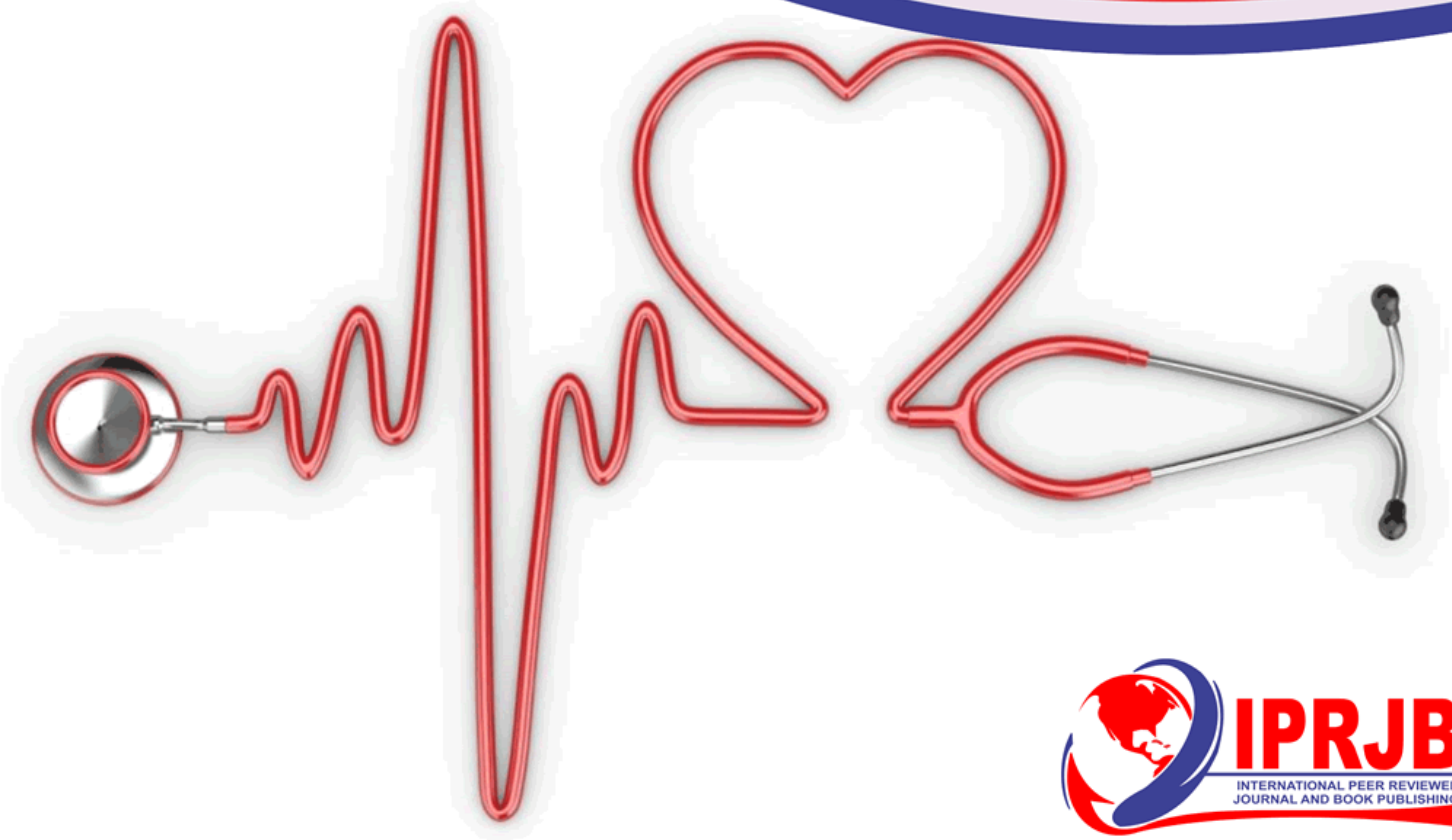

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DETERMINANTS OF ELECTRONIC MEDICAL RECORDS USE AMONG HEALTH CARE WORKERS IN HIV CARE FACILITIES IN KENYA IN NAIROBI COUNTY

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Abstract

Purpose: Recognizing that high-quality data are essential to HIV prevention, the study investigated the use of EMR and its determinants among healthcare workers in HIV care in Nairobi County, Kenya. The study's aim was to assess the determinants of electronic medical records use among health care workers in HIV care facilities in Nairobi County.

Methods: The study adopted a cross-sectional study design. Five sub-counties within Nairobi County were randomly selected and in each two health facilities with EMR systems were randomly selected. A total of 64 respondents from health information departments of the selected facilities were purposively recruited into the study. A self–administered structured questionnaire was used for data collection. Statistical Package for Social Science (SPSS) version 22 was employed during data analysis. Spearman correlation test was used to find relationships at a significance level of 0.05.

Results: From the findings, over a half (58%) of the respondents used EMR data**.** Less than a third (28%) and a third (33%) of the respondents reported to have fully and partially utilised the EMR data respectively. Functionality of the system was significantly (r_s=0.251, p=0.045) related with the type EMR tool. Update of records was significantly (r_s=0.283, p=0.023) associated with EMR data use. Further, integration of EMR with other systems was significantly (r_s=0.296, p=0.018) associated with extent of EMR utilisation. Other factors were not significantly (p>0.05) associated with use of EMR. A fair proportion of health care providers use EMR system in HIV care.

Unique Contribution to Theory, Practice and Policy: The study recommend that the whole aspect of HIS and EMR be considered as a study area in the curriculum of all healthcare workers to help ensure a seamless transition at the workplace and at the same time dealing with the issue of the human barrier.

Key Words: *Electronic medical records, health system and HIV care facilities*

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1.0 INTRODUCTION

1.1 Background of the Study

A health system refers to the activities whose aim is to promote good health. Chetley, *et al.*, (2006) argues that it includes preventive, curative and palliative services which a health care system can provide. The system is divided into 6 main pillars that is, the one that deals with service delivery, the workforce, a pillar dealing with information, medical products as well as that that is concerned with technologies on vaccines and lastly the one that deals with financing and governance or leadership.

This study is anchored on the pillar of Health Information Systems with special focus on strengthening Health Information Management through strengthening the use of the Electronic Medical Records (EMR) systems. Health information management refers to the way organizations plan and implement information technology initiatives to achieve their business objectives and results. Information can be managed effectively through an efficient Electronic Medical Records system. Even though that is the case, other activities that don't need technology to transmit information, such as paper-based text are not to be neglected (WHO, 2006).

The EMR system if well-adopted will help bridge the existing data management gaps both in private and public health facilities and in the entire Ministry of Health (Bate, et al., 2012). Its importance can especially be realized in the care of Human Immunodeficiency Virus (HIV). This is because devastating diseases like Acquired Immune Deficiency Syndrome (AIDS) require constant care and treatment in order to be held to a manageable level. In Kenya, HIV and AIDS accounts for one in three deaths, and 25% of all ill health (KHSSPI, 2013-17**)**. Infectious conditions in total are still accounting for 50% of all deaths and disabilities in Kenya. Health Information Management within organization is critical and consists of processes that predict the realization of Information technology benefits (Andresen, et al., 2000). Strategic Information technology management according to Plenert (2001) is a multidimensional construct that characterizes the extent to which organizations are deemed to plan, implement and use information systems in a competitively oriented manner.

Recognizing that high-quality data are essential to HIV prevention, care and treatment programs, many implementing partners have come up with different EMR systems and implemented through the HIV Care clinics such as the Inventory for Client and Agency Planning (ICAP) adopted Comprehensive care center Patient Database (CPAD) and University of Maryland adopted the International Quality patient care (IQ). Despite is importance, funding is a problem that hampers adoption of technology in management of HIV since among the developing economies; there has been low investment in the technology from the donors as well as the governments. This study investigated the use of EMR among healthcare workers as well as its relationship with aspects pertaining to health facilities and healthcare providers in Nairobi County.

1.2 Statement of the Problem

The Ministry of Health attaches great importance to the adoption of EMR systems that on a regular basis generate accurate, complete and relevant information management of health

investments at all levels. These systems have been rolled out in facilities by implementing partners (WHO, 2013). However, low demand and use of the system threatens further development of the system. Reports from the District Health Information System (DHIS) are different from those generated from the EMR systems. Further, DHIS reports and the reports in the EMR systems still have contrasting information. This brings out the question of whether these systems have been fully embraced by the facilities (Carter, et al., 2010).

Reports from the National Health Management Information System (HMIS) and the National health Accounts show that the problem of infrequent and incomprehensive data still exists despite the introduction of EMR systems in the facilities (Skolnik, 2011). Mitchell, (1997) argues that adoption of technology in health care is determined by the organization's internal structure. Furthermore, a challenge that continues to impede adoption of technology in healthcare is disparity in data where there is lack of timely patient data. A similar problem can be said of the Kenyan health care where reliable information is insufficient.

Why HIV care? HIV deaths are the highest in the country at 29.3%, and the highest cause of disability adjusted life years at 24.3% (KHSSPI, 2013-17**).** Planning in the Health System is dependent on the need that is described through the health information that is reported on a monthly basis. Poor reporting will lead to under planning which will result to poor health outcomes. Proper planning will lead to improved access to services, improved quality care, improved referral systems, reduced HIV prevalence from 5.6% to 4%, (KHSSPI, 2013-17**)** and reduce exposure to health risks and a robust financing mechanism among others.

A proper health information system, through adopting the EMR system will also lead to improving health outcomes, for example getting accurate diagnosis, treatment and prognosis. Besides that, a clear monitoring and evaluation system can be made available if technology is adopted (KHSSPI, 2013-17**).** As a result, there was a need to determine the determinants of full utilisation of EMR systems for information management.

2.0 LITERATURE REVIEW

Heeks (2006) examined the use of technology in National Health Information system development. Drawing from the health information system development studies literature to define this latter concept of technology infusion, he derived some conclusions for intervention by the key stakeholders, including the importance of minimizing the so-called Design, Reality Gap.

The notion of uniform development of HIS was problematised by Braa (2007) and in particular questioned the rhetoric that HIS should be a standardized instrument for gains within the context of healthcare services. He drew from a discourse analysis of research literature generated in developing countries, and argued for the crucial role, in his view, of the standardization and scalability in complex national HIS development.

Another study by Cibulskis and Hiawalye (2002) dealt with a specific country, Papua New Guinea, and discussed how to promote the increased use of health information in this particular country context, especially among the decision makers at the National level. In terms of information use, they emphasized the importance of demand for accurate health information by National Health Policy formulators, so the entire National Health System would be motivated to produce such information.

The paper provides an interesting conceptual basis, although in line with most published studies in this broad category, the data used was largely secondary in nature rather than being derived from the author's own empirical research. This is not necessarily an unsatisfactory situation, but contrasts with the more micro-level studies drawing on primary data, which forms the basis in the majority of the research literature surveyed.

The role of each component of HIS in bringing together networks in national interest in Uganda has also been studied. These included, in their case study, National Health Organizations, local health management units, other public sector organizations and Aid organizations. They showed how heterogeneous elements of a National Health Information system are brought together in a specific national–local combination, linked for example, to particular National plans for development. Although they did not state this explicitly in the article, the evaluation is clearly related theoretically to Design-Reality gap model proposed by (Heeks, 2010).

The growing phenomenon of diffusion of innovation and dynamic equilibrium organizational change models, and the problems related to wider organizational issues in Health Information Management were discussed by Gladwin and Dixon (2003). With data drawn from Uganda, they emphasized the specific difficulty in non-face-to-face communication when working across different related sectors. To offset this, they generated a model for sensitizing collaborators in cross-cultural and inter-sectoral development projects to issues and problems which may need to be handled.

Hammond and Baily, (2010) also dealt with cross-cultural and inter-sectoral issues in health information management both in developed and developing countries, drawing on secondary data. The output in this study is a model for the way forward with a stepwise approach namely: definition of a vision, developing a strategy, identifying leadership, assigning responsibilities, and harnessing resources. Other researchers took a critical stance on one aspect of inter-sectoral coordination, that standardization may impose its own logic when transferred between different sectoral contexts.

2.1 THEORETICAL AND CONCEPTUAL FRAMEWORK

Activity Theory and its Applications

The theory presents an internalization and externalization of cognitive processes mainly through development of tools as well as transformations resulting from those processes. The theory posits that an interaction of a subject and object using tools leads to a goal oriented interaction. The interaction of the human and computer is such a goal where the computer is a tool (Kaptelinin & Nardi 2006, Kuutti, 1995). From the activity theoretical perspective, the activity of any subject is a purposeful interaction of the subject with the world. It is a process in which mutual transformations between the subject and the object are achieved, where the subject and the object of an activity transform each other. In activity theory, this central process is called internalization. Through the analysis of activities, it is possible to understand both the subject and the object of the activity (Kaptelinin & Nardi, 2006).

The model is systemic and all the elements are related to each other. According to Kuutti (1995), it contains mutual relationships between subject, object and community. There are always various artifacts included in these activities. Tools and signs, Rules and Division of

labor involve artifacts which have a mediating role. The relationship between subject and object is mediated by tools (like instruments or programs) and signs (e.g., language), the relationship between subject and community is mediated by rules (for example laws) and the relationship between object and community is mediated by the division of labor.

The mediating terms are also historically formed and open to change. In the activity system the object is transformed into outcomes through a hierarchical process of activity. The hierarchy was developed by Leont'ev (1978) and it distinguishes between activity, actions and operations and relates these terms to motives, goals and the conditions under which the activity is performed. Activity, a collective phenomenon with a shared object and motive, can be divided to actions according to the division of work. Actions are conducted by individuals or a collective using a physical, or intellectual or abstract tool. For example, an abstract tool can be knowledge or skills (Mursu, et al., 2007). Activity systems are networked and interact with other activity systems. Even though individual or group actions are goal-directed and might be independent, they are understandable only against the background of the whole activity system. According to activity theory the prime unit of analysis should be the activity system (Engestrom, 2001).

Contradictions exist in development of change. Contradictions mean historically accumulated structural tensions within and between activity systems. These tensions might be caused by adopting a new element such as a technology from outside the system. Contradictions might not produce disturbances and conflicts exclusively, but may also produce innovative solutions to change the activities. When the object and motive are conceptualized to involve a radically wider horizon of possibilities than in the previous mode of the activity, an expansive transformation happens (Engestrom, 2001). According to Kaptelinin & Nardi (2006) all practice is a result of certain historical developments under certain conditions. The development is both an object of study and general research methodology in activity theory. The area where activity theory is applied is very broad, ranging from psychology and educational development to organization studies. The most interesting applications of activity theory in respect to the present study are work studies, information systems development and human-computer interaction.

Conceptual Framework

The conceptual framework looked at the adaptation and use of the EMR systems in HIV care among users; the case of private facilities in Nairobi County within the health sector.

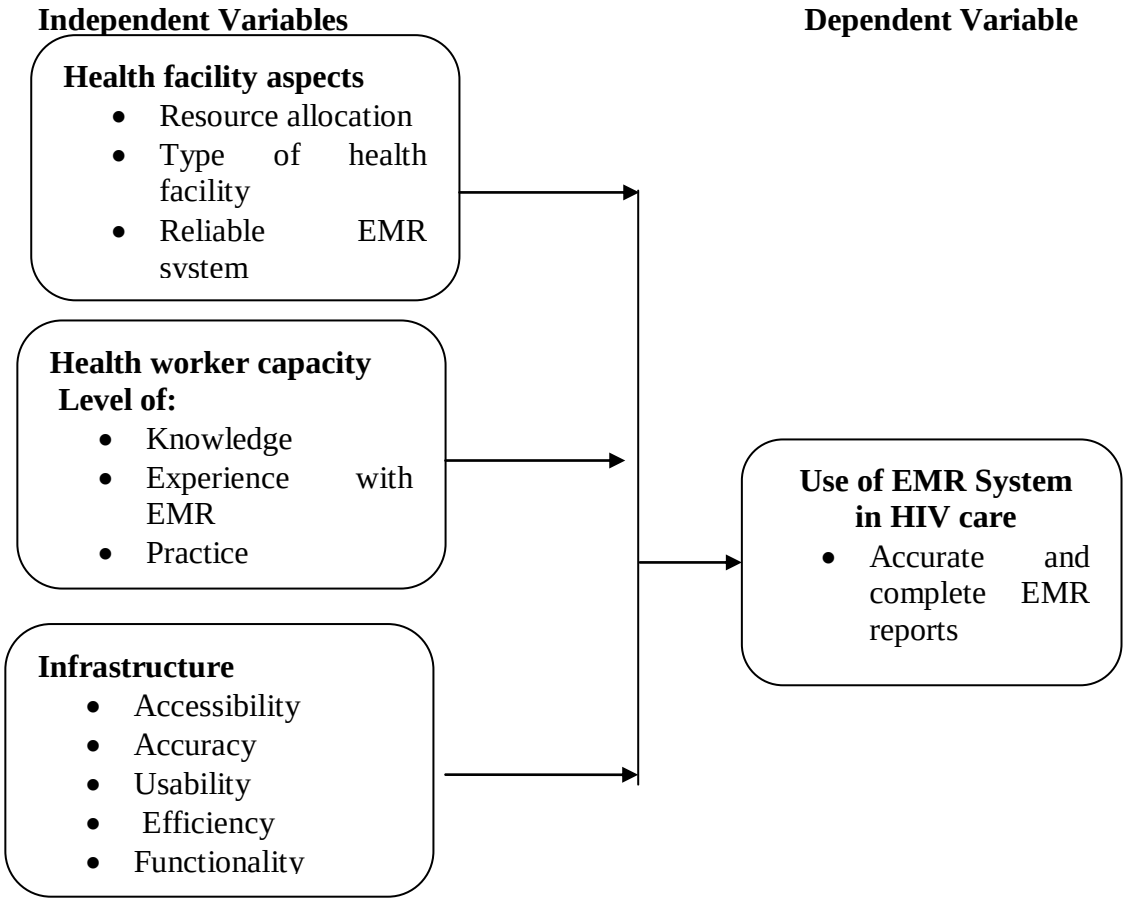

Figure 1: Conceptual Framework

3.0 RESEARCH METHODOLOGY

The study adopted a cross-sectional study design. Five sub-counties within Nairobi County were randomly selected and in each two health facilities with EMR systems were randomly selected. A total of 64 respondents from health information departments of the selected facilities were purposively recruited into the study. A self–administered structured questionnaire was used for data collection. Pre-testing was done in Makueni and Kitui District hospitals. Approval was sought from the Kenya Methodist University's Scientific and Ethical Review Committee (SERC). Statistical Package for Social Science (SPSS) version 22 was employed during data analysis. Spearman correlation test was used to find relationships at a significance level of 0.05.

4.0 RESEARCH FINDINGS AND DISCUSSIONS

4.1 Background characteristics

Close to two-thirds (64.1%) of the health facilities under study were private and slightly over a third (35.9%) were public. Overall, of the health facilities studied, over a half (59.4%) had a dedicated IT department. Of the study respondents, slightly over two-thirds (67.2%) either

two years or less within the facilities studied, nearly all (87.5%) had interacted with EMR systems and almost half (48.4%) had received training on EMR.

Table 1: Background characteristics of respondents (n=64)

Characteristic	Frequency	Percent (%)
Type of health facility		
Public	23	35.9
Private	41	64.1
Years worked in the health facility		
≤2 years	43	67.2
>2 years	21	32.8
Dedicated IT Department		
Yes	38	59.4
No	26	40.6
Interaction with EMR system		
Yes	56	87.5
No	8	12.5
Formal training on EMR		
Yes	31	48.4
No	33	51.6

n- number of respondents, EMR- Electronic Medical RecordsOf the study participants, 59.4% reported to have a dedicated IT department in their facilities. This is close to 62.5% of health care providers who reported that they had a computer available in their department (Chibole 2015). Moreover, nearly a half (48.4%) had received formal training on EMR. This proportion is lower than that of 66.7% of health workers who reported to have already been trained on EMR system as indicated in a study done in Kenya by Chebole (2015). These findings compares well with those a study done in South Africa where all the subjects had some computer experience, with 20% gaining the experience through the EMR and 80% with prior computer experience (Mashamaite, 2011). Further, according to Mashamaite (2011), 59% of subjects received basic training on the EMR and 7% of the subjects claimed not to have received any training at all on the EMR. The latter contrasts with the high proportion (51.6%) in this study who did not receive formal training.

4.2 EMR use

4.2.1 Type of EMR system

Only two types of EMR system (IQ care tool and Dream tool) were found to be utilised in the studied facilities with nearly all (92%) using IQ care tool (Figure 4.1).

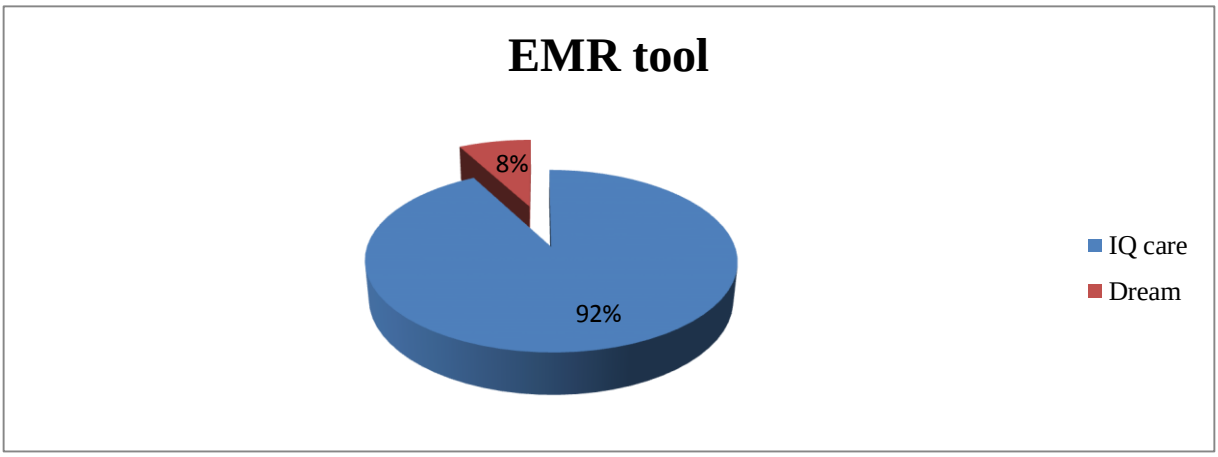

Figure 2: Type of EMR system (n=64)

4.2.2 Use of EMR data

Figure 3 indicates the use of EMR data in the studied health facilities. Over a half (57.8%) of the respondents used EMR data, 18.8% didn't use and 23.4% were not sure.

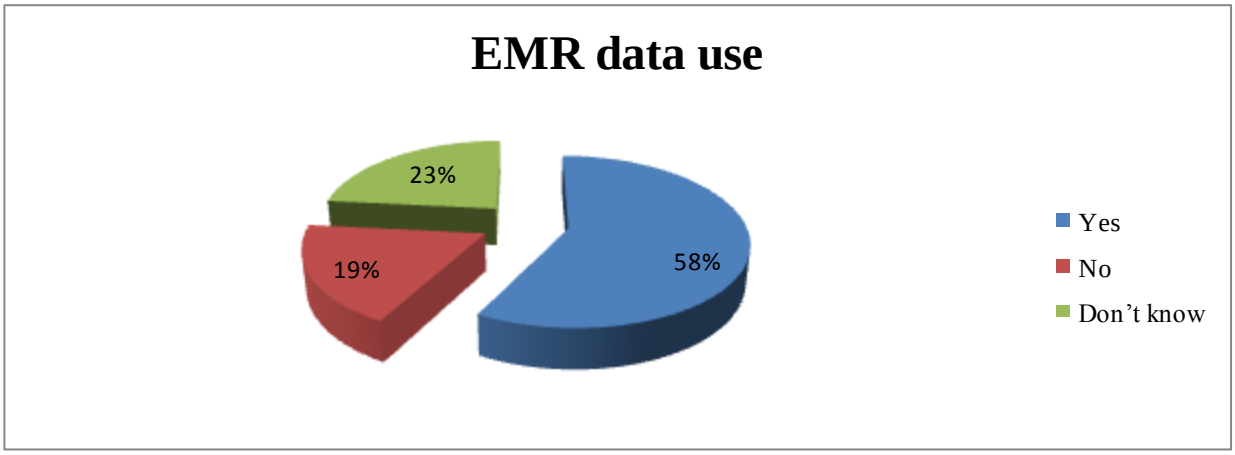

Figure 3: Use of EMR data (n=64)

The study findings indicate a positive trend in regard to the use of EMR data, with over half of the respondents (58%) having used EMR data at their workplace as compared to 19% who didn't use it and 23% who were not sure whether they had used it or not. This is very encouraging since it implies a willingness in healthcare workers to use the data availed by EMR, and this also translates to a willingness to the use of EMRs. However, there is need to educate all healthcare workers about the EMR system as a whole, and this may include computer skills.

4.3.3 Extent of EMR data use

Figure 4 shows the extent to which EMR system was utilized where 28.1% of the respondents reported that the EMR system was fully utilised, 32.8% partially utilised and 39.1% not utilised.

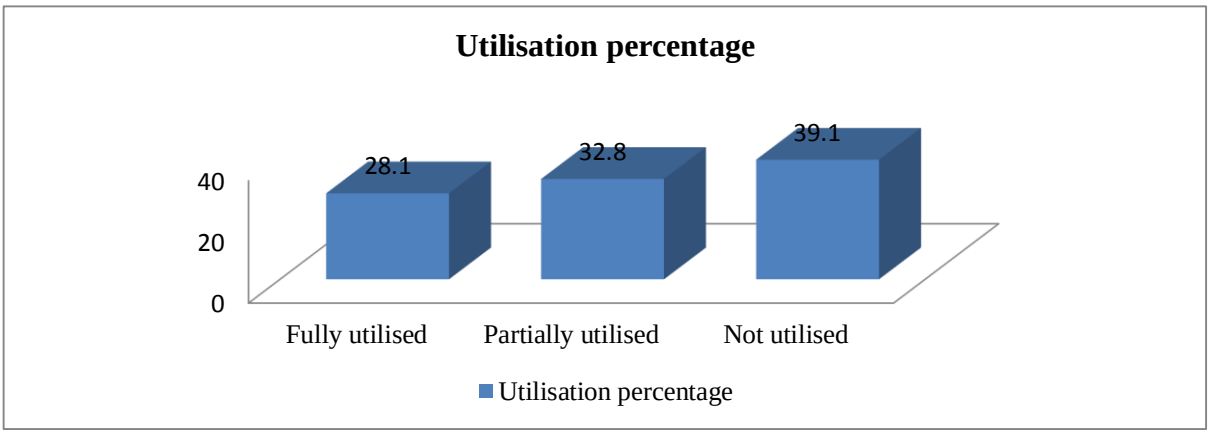

Figure 4: Extent of EMR data utilisation (n=64)

From the study findings, 28.1% of the respondents reported that the EMR system was fully utilised, 32.8% reported partial utilisation and 39.1% reported not having utilised the data. This low numbers indicate the resistance by healthcare workers towards fully embracing the use of EMR.

4.4 Health facility aspects and EMR use

A spearman correlation test was conducted to determine the relationship between health facility factors and use of EMR data (Table 2).

Table 2: Relationship between health facility aspects and use of EMR data (n=64)

Variable	use of EMR data
Type of health facility	r_s=0.031, P=0.809
Dedicated IT department	r_s=-0.170, P=0.180

r_s- Spearman correlation, n-number of respondents, EMR- Electronic Medical Records

There was no significant (p>0.05) correlation between type of health facility and presence of a dedicated IT department in the health facilities studied with use of EMR data.

Table 3 indicates the results of a spearman correlation test conducted to determine the relationship between health facility factors and the extent of EMR data utilization.

Table 3: Health facility aspects and extent of EMR data utilisation (n=64)

Variable	Extent of EMR data utilisation
Type of health facility	r_s=0.111, P=0.384
Dedicated IT department	r_s=0.044, P=0.730

r_s- Spearman correlation, n-number of respondents, EMR- Electronic Medical Records

There was no significant (p>0.05) correlation between type of health facility and presence of a dedicated IT department in the health facilities studied with the extent of EMR data utilisation.

4.5 Health worker aspects and EMR use

The duration which the respondents had worked within the health facilities, their interaction with EMR system and whether they had been trained formally on use of EMR system were correlated with the use of EMR data (Table 4).

Table 4: Health worker aspects and use of EMR data (n=64)

Variable	EMR data use
Years worked in the health facility	r_s=0.009, p=0.943
Interaction of EMR system with others	r_s=0.159, p=0.211
Formal training on EMR system	r_s=0.083, p=0.515

r_s- Spearman correlation, n-number of respondents, EMR- Electronic Medical Records.

From the study findings, the duration which the respondents had worked within the health facilities, their interaction with EMR system and their training on use of EMR system had no significant (p>0.05) correlation with the use of EMR data and its utilisation.

Table 5 shows the association between duration which the respondents had worked within the health facilities, their interaction with EMR system and whether they had been trained formally on use of EMR system with the extent of its utilisation.

Table 5: Health worker aspects and extent of EMR data utilisation (n=64)

Variable	Extent of EMR data utilisation
Years worked in the health facility	r_s=0.069, p=0.588
Interaction of EMR system with others	r_s=0.038, p=0.765
Formal training on EMR system	r_s=0.021, p=0.871

r_s- Spearman correlation, n-number of respondents, EMR- Electronic Medical Records.

From the spearman correlation test conducted, there was no significant (p>0.05) association between the duration which the respondents had worked within the health facilities, their interaction with EMR system and their training on use of EMR system with the of EMR data utilisation.

4.6 Infrastructure and EMR use

Table 6 shows the infrastructural factors that were studied.

Table 6: Infrastructural factors (n=64)

Factor	Frequency (n)	Percent (%)
Reliable computer access point		
Yes	59	92.2
No	5	7.8
Efficiency of EMR access point		
Very efficient	11	17.2
Just okay	28	43.8
Inefficient	25	39.1
EMR system easy to use		
Strongly agree	5	7.8
Agree	15	23.4
Don't know	20	31.3
Disagree	23	35.9
Strongly disagree	1	1.6
EMR system robust		
Strongly agree	8	12.5
Agree	6	9.4
Don't know	17	26.6
Disagree	31	48.4
Strongly disagree	2	3.1
EMR system non-functionality		
Yes	30	46.9
No	32	50
Don't know	2	3.1
Duration for EMR system to resume		
1 hour	17	26.6
3 hours	16	25.0
6 hours	1	1.6
24 hours	16	25.0
>24 hours	14	21.9
Update of records when system backup		
Yes, always	14	21.9
Not always	30	46.9
Never	17	26.6
Don't know	3	4.7
Integration of EMR system with others		
Yes	30	46.9
No	34	53.1

EMR- Electronic Medical Records.

It is necessary to have a solid, medical-grade infrastructure and operational readiness since extended outages of an EMR system often has far-reaching implications for safety, patient care and operations. This compares well with a study done by Mashamaite (2011) where

various components of EMR system infrastructure including its functionality were studied. Findings from the study indicates that nearly all (92.2%) of the study participants reported that there was a reliable computer access point. This shows an increase compared to 57.0 % health care providers who reported they had full access to a computer daily (Chibole, 2015). 7.8% and 23.4% strongly agreed and agreed respectively that EMR system is easy to use. These combined, are slightly lower than that of 38.9% who reported ease of use, that the EMR system was good, as found in study done by Chebole (2015).

Spearman correlation test was conducted to determine the relationship between infrastructural factors and type of EMR system (Table 7).

Table 7: Relationship between infrastructure and EMR tool (n=64)

Variable	EMR tool
Reliable computer access point	r_s=0.180, p=0.154
Efficiency of EMR access point	r_s=-0.096, p=0.452
EMR system easy to use	r_s=-0.040, p=0.756
EMR system robust	r_s=-0.100, p=0.432
EMR system non-functionality	***r_s=0.251, p=0.045**
Duration for EMR system to resume	r_s=0.047, p=0.711
Update of records when system backup	r_s=-0.125, p=0.324
Integration of EMR system with others	r_s=0.040, p=0.753

*Significant at 0.05, r_s- Spearman correlation, n-number of respondents, EMR- Electronic Medical Records.

There was a significant (r_s=0.251, p=0.045) correlation between the functionality of EMR system and type of EMR tool. Other infrastructural factors were not significantly (p>0.05) related with the type of EMR tool.

An association between infrastructural factors and use of EMR data was determined using spearman correlation test (Table 8).

Table 8: Association between infrastructure and use of EMR data (n=64)

Variable	EMR data use
Reliable computer access point	r_s=0.201, p=0.111
Efficiency of EMR access point	r_s=0.136, p=0.284
EMR system easy to use	r_s=0.026, p=0.838
EMR system robust	r_s=0.077, p=0.543
EMR system non-functionality	r_s=0.008, p=0.953
Duration for EMR system to resume	r_s=-0.094, p=0.462
Update of records when system backup	r_s=-0.107, p=0.402
Integration of EMR system with others	***r_s=0.296, p=0.018**

*Significant at 0.05, r_s- Spearman correlation, n-number of respondents, EMR- Electronic Medical Records.

There was a significant (r_s=0.296, p=0.018) correlation between integration of EMR with other systems and use of EMR data. Other infrastructural factors had no significant (p>0.05) association with use EMR data. According to Mashamaite (2011), most subjects in his study agreed that EMR system is easy to use as opposed to this study where easy to the EMR system was not significant.

From study findings, reliable EMR access points were not significantly associated with their use. This is in contrast with findings from other studies. In a study done at Kibera clinics by Jawhari, et al. (2016), unreliable infrastructure hindered the use of EMR, In another study conducted in Uganda, findings indicated that the length of patients visit was reduced by 11.5 minutes when EMR based clinical care was implemented. (Were and Tierney, 2010). Similarly, in a systematic review by Oluoch and Keizer (2012), two studies indicated reduced patient waiting time. Moreover, findings from another study conducted by Amoroso, et al. (2010) in Rwanda showed a significant improvement in accessing laboratory results by clinicians due to an integrated laboratory system in the EMR. These findings concur with the findings of another study by Were et al, (2010) in which findings indicated general accuracy, improved care as well as reduced mistakes. There was a general agreement that the use of EMR and data stored in EMRs improves care, quality and efficiency

Table 9 indicates the relationship between infrastructural factors and the extent of EMR data utilisation.

Table 9: Infrastructure and extent of EMR data utilisation (n=64)

Variable	Extent of EMR data utilisation
Reliable computer access point	r_s=-0.055, p=0.666
Efficiency of EMR access point	r_s=0.080, p=0.529
EMR system easy to use	r_s=-0.154, p=0.224
EMR system robust	r_s=-0.058, p=0.649
EMR system non-functionality	r_s=-0.209, p=0.098
Duration for EMR system to resume	r_s=-0.097, p=0.443
Update of records when system backup	***r_s=0.283, p=0.023**
Integration of EMR system with others	r_s=0.056, p=0.661

*Significant at 0.05, r_s- Spearman correlation, n-number of respondents, EMR- Electronic Medical Records.

There was a significant (r_s=0.283, p=0.023) correlation between update of records when the system backup after being nonfunctional and the extent of EMR data utilisation. This is in tandem with findings from Mashamaite (2011) which indicated that regular backup was significant to the EMR usage. Other infrastructural factors were not significantly (p>0.05) related with the extent of EMR data utilisation.

5.0 SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Summary of Findings

The study sought to determine the extent of EMR use among health facilities with EMR systems in Nairobi County. Nearly all (92%) health facilities studied used IQ care tool for

EMR. Over a half (57.8%) of the respondents used EMR data. Moreover, 28.1% of the respondents reported that the EMR system was fully utilised, 32.8% partially utilised and 39.1% not utilised.

The study sought to determine the effect of health facility aspects on use of EMR system in Nairobi County. Of the health facilities studied, close to two-thirds (64.1%) were private. Additionally, over a half (59.4%) had a dedicated IT department. The health facility aspects were not significantly ($p>0.05$) related with the use of EMR system.

the study sought to determine the influence of health worker capacity on use of EMR system in Nairobi County. The work experience, whether the health workers had received formal training on EMR system and if they had interacted with EMR system were determined. Of the study participants, two-thirds (67.2%) had worked for 2 years and below in the studied health facilities, almost a half (48.4%) had received formal training on EMR and nearly all (87.5%) had interacted with EMR systems. However, the health workers' aspects were found not be significantly ($p>0.05$) related with the use of EMR system.

The study intended to establish how infrastructure status affects use of EMR systems among healthcare workers in Nairobi County. Infrastructural factors studied include access to EMR system, its efficiency, usability and its integration with other systems. Of these, update of records, functionality of the EMR system and its integration with other systems had a significant ($p<0.05$) association with EMR use

5.2 Conclusions

From the study findings, a fair proportion of health care providers use the EMR system in HIV care. Health workers' and health facility aspects were found not related with the use of EMR system. Update of records, functionality of the EMR system and its integration with other systems had a significant association with use of EMR. Other infrastructural factors did not have a significant association with use of EMR.

5.3 Recommendations

The study recommended that the whole aspect of HIS and EMR be considered as a study area in the curriculum of all healthcare workers to help ensure a seamless transition at the workplace and at the same time dealing with the issue of the human barrier. Since the financial aspect is also a big barrier towards the successful implementation and running of these programs and given the costly and somewhat complex nature of IT software, the interested parties could consider coming up with systems that are not too expensive as well as those that have user friendly interfaces.

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