

Exploring Health Information and Management System Trends Among Healthcare Workers at Kenyatta National Hospital

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ABSTRACT:

Objective: The project aimed to call to mind the exploration of health management and information systems among healthcare workers at Kenyatta National Hospital, Kenya.

Design setting: The investigation deployed a cross-sectional study.

Subjects or participants: A sample total of 263 respondents was calculated using the Krecie and Morgan formula for the quantitative study. A strict inclusion criterion was followed to select the respondents from all trained health personnel in Kenyatta National Hospital. The study utilized an interview schedule. Data were analyzed using SPSS version 21 while qualitative data was analyzed on themes developed. Data presentation was in the form of quantitative statistics such as frequency distribution, percentages and tables. Qualitative results were presented in verbatim form.

Results: A total of 263 respondents were engaged in the quantitative study. The study utilized a questionnaire and a key informant interview guide. Before processing quantitative data, data was cleaned, coded and keyed into MS Excel database computer and analyzed using SPSS version 21. Descriptive statistics were used to describe measures of central tendency and dispersion. Findings were presented using frequency distributions and summary tables. Associations between predictor and outcome variables were run through Correlational statistics. Of the 263 respondents, 193 (72.6%) were optimistic that HMIS had brought about better up-dating and expertise in healthcare service delivery and 40(15%) were neutral while, 33(12.4%) were pessimistic about the concept. A weak positive correlation ($r = 0.3345$, $p = 0.03$) between self-confidence in productivity and HMIS implementation was observed.

Conclusion: The KNH management needs to ensure that there is system thinking, where each staff is not only motivated but also feels part and parcel of a robust and cohesive HIMS process

KEYWORDS: Health Information, Health System, Health Management Information System, Interoperability, Universal Health Coverage, Implementation, Digital Transformation, Augmentation, Standardized,

INTRODUCTION

The challenging adoption process of new ultra-modern systems can lead to the abandonment of such technology, resulting in a regression to manual systems and a decline in innovation output. The landscape of health information systems is in a perpetual state of evolution, adapting to the needs of the times. This ensures that they remain relevant and effective in their ability to provide valuable solutions for individuals and organizations alike. [1] notes that interoperability of the health management Information is systems. For better and more effective interventions in dealing with tropical and infectious diseases we need improved and quality health systems. Health Information Management Systems (HIMS) serve a critical function in healthcare, including areas of public health, administration, research and education. Expectedly there are significant limitations to all healthcare administrative and public health data. Often this relates to the breadth of data collected, which is frequently determined by the expected HIMS.

Resistance to medicines such as antibiotics is on the rise. This makes it harder to treat certain diseases. Natural and man-made disasters create refugee populations with immediate and long-term health problems. As attested by [2], International health, also called geographic medicine or global health, is a field of health care, usually with a public health emphasis, dealing with health across regional or national boundaries. Health systems research is increasingly being conducted in low and middle-income countries (LMICs). Such research should aim to reduce health disparities between and within countries as a matter of global justice.

The implementation of HMIS is crucial for monitoring diseases, allocating resources, evaluating programs, conducting research, and enhancing healthcare systems to achieve optimal public health outcomes. The lack of coordination, transparency, and timely data sharing has severely impeded the progress of HMIS on a global scale. [3] recognizes the critical role HMIS plays in managing and overseeing public health concerns such as Malaria, Polio, TB, pandemics, and other diseases of public health importance.

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Despite the overall improvement in service delivery and quality of care in populations, low-income countries like Kenya face significant challenges in adopting HMIS. Public health concerns observed at National referral facilities can be attributed to HMIS. The healthcare systems in various African countries are widely recognized for their complexity, lack of transparency, and fragmentation. According to [4], embracing modern innovations in healthcare technology is one among very many ways of improving efficiency and reducing losses within healthcare organizations. The integration of information and health services envisaged benefits cannot be disputed, still, there are many challenges which affect and determine its effectual adoption. A vital approach to the design and implementation of any HIT and health program is to identify the various stakeholders who need to be involved and find mechanisms for including and incorporating their perspectives and concerns while simultaneously finding ways to mobilize their skills, expertise and resources.

As reported by [5], Kenya's health sector faces challenges, including weak health information systems. The Health Information System Policy for Kenya from 2012 to 2030 identifies inadequate capacities of HIS staff, unskilled personnel handling data, and numerous parallel data collection systems as weaknesses. The current HIS provides limited information for monitoring health goals and empowering communities and individuals with timely and understandable information on health. Improvements are needed to make Kenya's health information systems more effective and efficient.

METHODS

The study was conducted at Kenyatta National Hospital in Nairobi County, Kenya. KNH is a National referral facility at the apex of the healthcare sector in Kenya both as a facility and a training center. As per the time of the study the facility had 50 wards, 22 outpatient clinics, 24 theatres (16 specialized) and an Accident and Emergency department it has a bed capacity of 1800 beds out of which 209 beds are for the private wing. The Hospital was built to fulfill the role of being a National Referral and Teaching Hospital, as well as to provide medical research environment. The study utilized a Cross-sectional research design. Cross-sectional studies portray an accurate profile of persons, events, or situations at that particular time. It allows the collection of large amounts of data from a sizable population in a highly economical way. As per the healthcare tiers in Kenya, KNH is at the apex of which is the National Teaching and Referral Hospital and thus was purposefully selected. These allowed the study to collect data which was analyzed quantitatively and qualitatively using descriptive and inferential statistics. These details corroborated the Cross-sectional survey as deemed the best strategy to fulfill the objectives of the study. The research design explored a case study of KNH. There were 4,490 accredited healthcare service delivery officers at Kenyatta National Hospital who would have in one way or another been involved in implementing the HMIS. The study included all the 4,490 accredited healthcare service delivery officers in the three levels of management; top/managerial, middle/ and operational levels at Kenyatta National Hospital who would have in one way or another been involved in implementing the HMIS. All other persons not involved in the HMIS implementation were excluded. KNH has 46 departments in total. From the organogram respondents were sampled based on their relevance and phases of HMIS implementation, thus there were three cadres of respondents. Since a sample was selected from the KNH located in Nairobi, it was expected that selecting one healthcare worker/respondent was the same as selecting the other. In the determination of the target population to be surveyed, a qualitative and quantitative sample size was determined consequently, according to the Krecie and Morgan formula, three factors served as the basis for appropriate determination of the sample size. These factors were the projected frequency of the preferred respondent characteristic (p) from which an approximated 87.5% of the health professional officers surveyed were expected to persuade that the research was viable. The other factors used were the preferred level of confidence (t) which was set at 95% (gives a standard value of 1.96) and the acceptable margin of error (m) set at 4% (which gives a standard value of 0.04). Given the three factors, the sample size was thus calculated using the formula:

Total number of health workers = 4,490

19 departments are directly involved with HMIS

$$N = \{t^2 \times p (1-p) \times 1\} / m^2$$

$$= 1.96^2 \times 0.875 (1-0.875) / 0.04^2$$

$= 0.420175 / 0.0016 = 262.609375$ and thus, 263 respondents at the operational level and thus 14 respondents in each stratum/department. A questionnaire and key informant interview schedule were used as data collection tools. The data collection method was through the use of questioning and interviewing. The data collection technique involved structured and unstructured questions combined with a key informant interview. Before processing the quantitative data collected from the field, it was cleaned, edited, coded then entered into a computer software and analyzed using SPSS version 21. Qualitative data which cannot be represented by a numerical statistic, was done through qualitative content analysis. The study proposal was submitted to the Kenyatta National Hospital/University of Nairobi ethical review committee for ethical approval. Subsequent approval was vindicated upon meeting the warranted KNH/UoN ERC threshold.

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RESULTS

Based on the results of the study, out of the 263 individuals who responded, 193 (72.6%) were optimistic that HMIS had brought about better up-dating and expertise in healthcare service delivery and 40(15%) were neutral while, 33(12.4%) were pessimistic on the concept. On Resistance to change study results indicated that 175 (65.8%) had a negative attitude on the concept, 60 (22.6%) were neutral while a small proportion 31 (11.7%) had a positive attitude (Table 1).

Table 1: Respondent’s perceptions on Individual factors influencing HMIS Implementation at Kenyatta National Hospital

Factors n (%)	Negative Attitude	Neutral	Positive Attitude
Skills or training in HMIS	260 (98.8)	3 (1.2)	0 (0.0)
Training wish in HMIS	259 (98.5)	4 (1.5)	0 (0.0)
Efficiency in healthcare service delivery	33 (12.4)	40 (15.0)	193 (72.6)
Change resistance	175 (65.8)	60 (22.6)	31 (11.7)

Study results indicated a very strong positive correlation ($r=0.8$) between HMIS management and HMIS implementation at KNH and a strong positive correlation ($r=0.6$) between integrated approaches and HMIS implementation at KNH. This suggests that robust management practices and integrated approaches are associated with successful HMIS implementation at KNH. There was also a strong positive correlation ($r=0.6$) between the day-to-day use of HMIS in KNH and HMIS implementation and a moderate positive correlation ($r=0.4$) between standardized methods and Implementation of HMIS at KNH. This suggested that regular use of the system and standardized methods are also important for successful implementation. Results also indicated a moderate positive correlation ($r=0.4$) between Management trainings and HMIS implementation at KNH. Study findings showed a very weak negative correlation ($r=-0.2$) between the fair distribution of computers and HMIS implementation at KNH. (Figure 1).

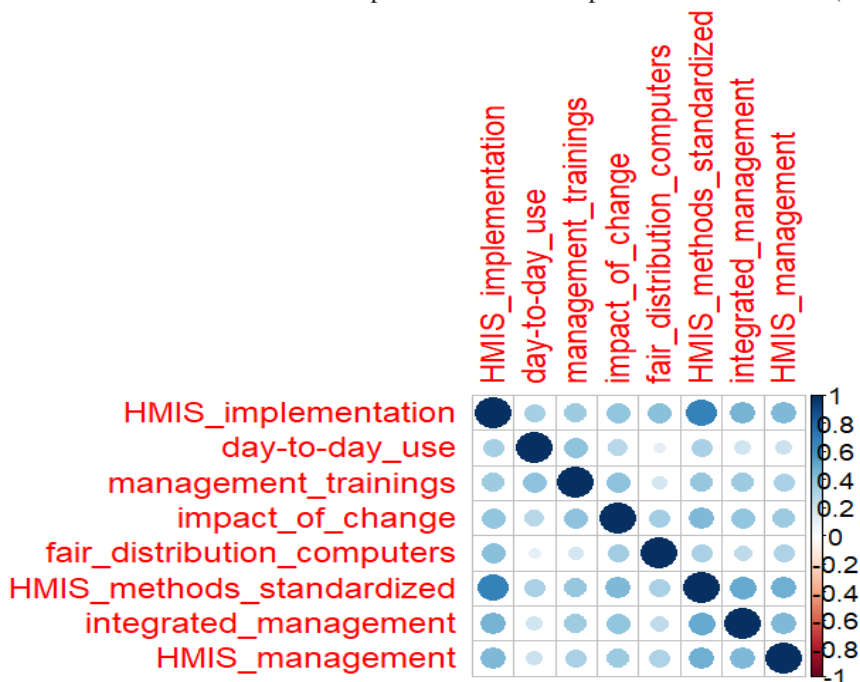


Figure 1: Correlational plot indicating Individual factors and HMIS implementation at KNH

Based on the results of the study, the correlation matrix analysis revealed intricate relationships between HMIS implementation and various independent variables within healthcare settings. Though significant, noteworthy findings included a very weak positive correlation between HMIS implementation and service delivery speed ($r = 0.2790, p = 0.11$) and a weak positive correlation ($r = 0.3345, p = 0.03$) between self-confidence in productivity and HMIS implementation. The study findings also indicated a very weak positive correlation ($r = 0.1442, p = 0.25$) between the perceived importance of progress and implementation of HMIS. There was no significant correlation between the rate of HMIS skills and training and HMIS implementation ($r < 0.0001, p = 0.63$), suggesting the need for a nuanced understanding of training quality. Moreover, a very weak negative correlation ($r = -0.1221, p > 0.05$) was observed between the desire for training in HMIS and its implementation, a red flag about training effectiveness. The study also highlighted

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a very weak negative correlation ($r = -0.0324$, $p=0.63$) between the impact of resistance to change and HMIS implementation and a weak positive correlation ($r = 0.2195$, $p=0.06$) between fear of expertise obsolescence and HMIS adoption. These findings underscored the multidimensional nature of factors influencing HMIS implementation, providing insights crucial for informed decision-making in healthcare management (Table 4.7).

Table 4.7: Correlational matrix indicating Individual factors and HMIS implementation at KNH

Implementation of HMIS	Skills and training	Confidence in productivity	Perceived importance to progress	Standardized methods	Service delivery	Self-confidence in productivity	Management trainings	Integration of approaches	Day-to-day use of HMIS	Resistance to change	Fear of expertise obsolescence	Perceived importance to progress	Skills and training
1	0.0000	-0.1221	0.0000	0.2790	0.1869	0.3345	0.2272	0.1091	0.0842	0.2195	0.0595	0.1442	0.0324
0.0000	1	0.0307	0.5719	-0.0021	-0.0254	-0.0410	-0.0532	-0.0807	0.2373	0.1863	0.0514	-0.1394	-0.0296
-0.1221	0.0307	1	-0.0147	-0.0990	-0.1925	-0.1376	-0.0317	-0.1060	0.0754	0.0398	0.0138	0.0477	0.0559
0.0000	0.5719	-0.0147	1	-0.0147	-0.0425	-0.0622	-0.0786	-0.0575	0.0964	0.1416	-0.0196	-0.1613	0.0857
0.2790	-0.0021	-0.0990	-0.0147	1	0.6249	0.4632	0.2810	0.2714	-0.0495	0.1055	-0.0207	0.1375	-0.1507
0.1869	-0.0254	-0.1925	-0.0425	0.6249	1	0.5855	0.2964	0.3201	-0.1546	0.0592	0.0186	0.1307	-0.1841
0.3345	-0.0410	-0.1376	-0.0622	0.4632	0.5855	1	0.3407	0.2748	-0.0961	0.1891	0.0935	0.1125	-0.0508
0.2272	-0.0532	-0.0317	-0.0786	0.2810	0.2964	0.3407	1	0.1881	0.0759	0.2264	0.0598	0.3463	-0.0499
0.1091	-0.0807	-0.1060	-0.0575	0.2714	0.3201	0.2748	0.1881	1	-0.0620	0.0044	0.1903	0.0662	0.0363
0.0842	0.2373	0.0754	0.0964	-0.0495	-0.1546	-0.0961	0.0759	-0.0620	1	0.3755	0.0942	-0.0673	0.0691
0.2195	0.1863	0.0398	0.1416	0.1055	0.0592	0.1891	0.2264	0.0044	0.3755	1	0.3312	0.1413	-0.0399
0.0595	0.0514	0.0138	-0.0196	-0.0207	0.0186	0.0935	0.0598	0.1903	0.0942	0.3312	1	0.1721	0.0801
0.1442	-0.1394	0.0477	-0.1613	0.1375	0.1307	0.1125	0.3463	0.0662	-0.0673	0.1413	0.1721	1	-0.1351
0.0324	-0.0296	0.0559	0.0857	-0.1507	-0.1841	-0.0508	-0.0499	0.0363	0.0691	-0.0399	0.0801	-0.1351	1

DISCUSSIONS

The study results indicated a very strong positive correlation ($r=0.8$) between HMIS management and HMIS implementation at KNH and a strong positive correlation ($r=0.6$) between integrated approaches and HMIS implementation at KNH. This suggests that robust management practices and integrated approaches are associated with successful HMIS implementation at KNH. There was also a strong positive correlation ($r=0.6$) between the day-to-day use of HMIS in KNH and HMIS implementation and a moderate positive correlation ($r=0.4$) between standardized methods and Implementation of HMIS at KNH. This implied that regular use of the system and standardized methods are also important for successful implementation. Results also indicated a moderate positive correlation ($r=0.4$) between Management trainings and HMIS implementation at KNH. These findings were in line with those [6] reported in that they showed that the adoption and implementation of HMIS in any organization greatly impacts service delivery. The report was central to the contrary study findings that observed a very weak negative correlation ($r= -0.2$) between the fair distribution of computers and HMIS implementation at KNH. Based on the results of the study, the correlation matrix analysis revealed intricate relationships between HMIS implementation and various independent variables within healthcare settings. Noteworthy findings included a positive correlation ($r = 0.2790$, $p =0.11$) between service delivery and HMIS implementation at KNH indicating that hospitals with efficient HMIS experience significantly faster service delivery. The study findings indicated that a positive correlation ($r = 0.3345$, $p =0.03$) was observed between self-confidence in productivity and HMIS implementation suggesting that a positive perception of HMIS contributes to increased confidence in delivering healthcare services, also a positive correlation ($r = 0.1442$, $p=0.25$) was noted between the perceived importance to progress and Implementation of HMIS at KNH emphasizing the role of perceived importance to progress significance in driving adoption. There was no significant correlation implementation ($r <0.0001$, $p = 0.63$), between HMIS implementation and HMIS skills and training, suggesting the need for a nuanced understanding of training quality.

The hardware and software were available to the users and were used to produce and store data; the HMIS is a process that helped improve data management. There is a need for ICT health experts, as equipped by [7], to train health workers on the necessary skills with regards to HMIS and ensure that there is enough resource allocation to help with the implementation and ultimately, delivery of quality services to the patients. The study findings contradicted the premier literature despite training being one vital factor in HMIS implementation. Moreover, a very weak negative correlation ($r = -0.1221$, $p>0.05$) between the desire for training in HMIS and HMIS implementation was noted. The study findings also highlighted a very weak negative correlation ($r = -0.0324$, $p=0.63$) between the impact of resistance to change and the implementation of HMIS at KNH, implying that individuals more resistant to change may be less likely to support or actively engage in the implementation of HMIS. Results also indicated a weak positive correlation ($r = 0.2195$, $p=0.06$) between fear of expertise obsolescence and HMIS adoption. These findings underscored the multidimensional nature of factors influencing HMIS implementation, providing insights crucial for informed decision-making in healthcare management. In addition to the study findings, was the aspect of systems perspective where what an individual does affects everyone and other people's decisions affect you and thus a systematic thinking which will result to informed decision-making during planning.

Based on the key informant, the study observed that the registration component of HMIS had greatly helped in the identification of patients. Data was well captured, processed, stored, and retrieved, though much should be done to make it effective. User training

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programs needed to be rolled out, owing to the fact that there was very little training done to the users before the implementation of HIMS. HRIO in charge of renal and orthopedic were of the view that the HMIS users were well trained on the use of the software. Interestingly, the correlation between HMIS implementation and past success without HMIS evidence was positive but relatively low ($r = 0.0842$). This suggested that while past success may influence the decision to adopt HMIS, it is not a strong predictor. Furthermore, the implementation of HMIS was found to be significantly associated with improved turnaround time, increased self-confidence in productivity among workers, and faster, better, and easier healthcare service delivery. Overall, the findings suggested that the successful implementation of HMIS at KNH is influenced by organizational, technical, and individual factors. To ensure effective implementation and utilization of HMIS, it is essential for the hospital to continue using HMIS in its day-to-day activities, provide support for HMIS training, address the cost implications of ICT equipment and tools, improve training programs, and ensure the availability of a highly skilled labor pool.

CONCLUSIONS

The study findings indicated that although it can be challenging to compare different individuals' aspects in HIMS, a significant number of people are interested in health information and feel left behind regarding their health information techniques. The basic idea here is that individuals create and influence institutions which consequentially create and influence a culture which will in return result to informed decision-making during planning. Therefore, it is very essential for the KNH management to ensure that there is system thinking, where each and every individual staff is not only motivated but also feels part and parcel of a robust and cohesive HIMS process, subsequently, essential signals regarding the individual needs and wants catered for which can in return increase work performance leading them towards success.

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