ORGANIZATIONAL DETERMINANTS OF HEALTH INFORMATION UTILIZATION IN MAKING DECISION AMONG HEALTHCARE MANAGERS IN MOMBASA COUNTY, KENYA

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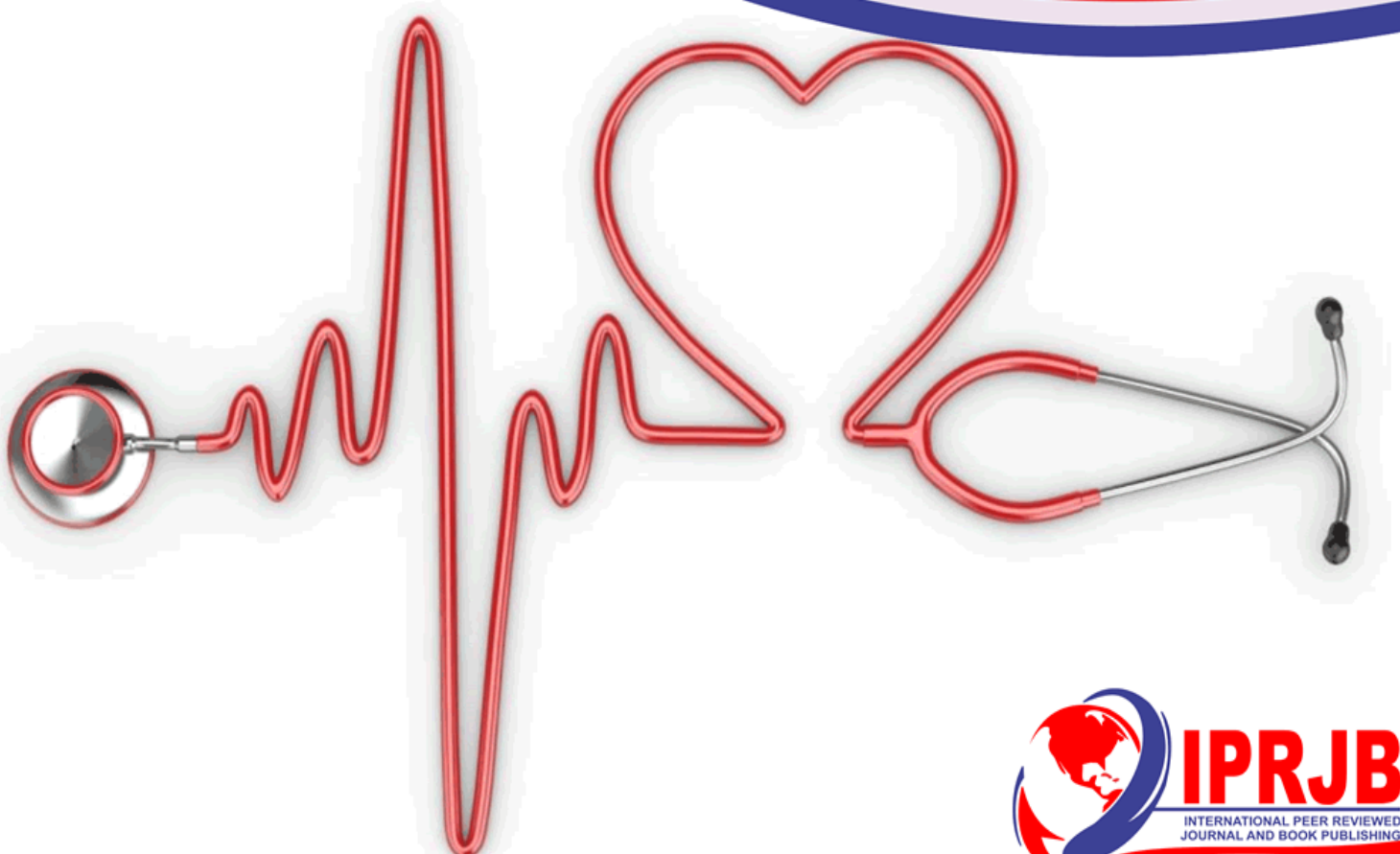
ORGANIZATIONAL DETERMINANTS OF HEALTH INFORMATION UTILIZATION IN MAKING DECISION AMONG HEALTHCARE MANAGERS IN MOMBASA COUNTY, KENYA

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Abstract

Purpose: This was a study based on Health Information Systems pillar. The objective was to examine organizational factors which influence health information utilization in making decision among healthcare managers in Mombasa County.

Methodology: This was a Descriptive Survey Study design where desired data was obtained from selected respondents by semi-structured questionnaires. The research targeted a total of 303 healthcare managers in Mombasa County which comprised of 21 County Health Management Team (CHMT) members, 56 Sub-county Health Management Team (SCHMT) members from the four sub-counties, 43 facility In-Charges from the 43 public health facilities and 183 Heads of Departments (HODs). A sample size of 91 healthcare managers (30% of the target population) was used in the study with a response rate of 98.9% being achieved. Data was analyzed with SPSS version 23.

Findings: Results revealed that organizational factors ($\beta_2 = 0.233$; $t = 4.552$; $p < 0.01$) were significant predictors of health information utilization in making decision among healthcare managers in Mombasa County. These results imply that improvement in these variables (Feedback mechanisms, Supportive supervision and Resource availability on Health Information Systems) will enhance health information utilization in making decision.

Unique contribution to theory, practice and policy: Implementation of the study findings will ensure that healthcare organizations have systems and infrastructure for improving interpersonal relationship among healthcare workers and managers, providing clear guidelines and defining roles and responsibilities related to HIS thus improving evidence-based decision making. When this is done, the study will have validated the theory of Evidence Based Health Information System by Carbone, (2009), on which the study was anchored. This theory further explains that there is need for a "catalyst" which is responsible for ensuring that the overall clinical care task is performed. Organizational factors are some of the catalysts referred to in the theory that when looked into will ensure an improved health outcome. The study recommends that the Ministry of Health (MOH) introduces Health Management Information Systems (HMIS) as a subject in the pre-service curriculum of all healthcare cadres in order to improve Health Information Systems (HIS) and facilitate proper prioritization of health needs, interventions and proper resource allocation.

Key words: *Data; Decision making; Health Information; Routine Health Information Systems; Healthcare Managers*

1.0 INTRODUCTION

1.1 Background of the study

Reliable and timely health information is essential for policy development, proper health management, evidence-based decision-making, rational use of resources, and the monitoring and evaluation of the public health situation, health care delivery and outcomes (WHO, 2019). Utility of health information not only keeps individuals and members of the public informed and empowered to make the right decisions concerning their well-being but also influences public health policy and decision making; advances skills in developing products and tools to promote, maintain, protect and restore health (WHO, 2014). Therefore, using information to make decisions is very important for continuous improvement in health system.

Health Information System (HIS) is a core pillar in strengthening health systems and its availability enables healthcare managers to use it in their daily managerial duties. Reliable information on service delivery and other key indicators is, therefore, very valuable for all healthcare managers. According to WHO, (2014), health care providers in various healthcare organizations, globally, cannot identify problems and prioritize needs, neither can they monitor and evaluate the impact of interventions they put in place. As a result, there are increased running costs of health facilities due to recurrence of diseases, and inconsistencies in patients' management. A properly functioning HIS gets the right information into the right hands at the right time, enabling policymakers, managers, and individual service providers to make informed choices on decisions ranging from patient care to national budgets (MEASURE Evaluation, 2015).

Health information utilization in Africa ranges between 10 to 56% (Shiferaw *et al,* 2017). There is lack of capacity to use data, across Africa, in such a way that healthcare managers can evaluate the impacts of changes they in put in place, (Nyamtema, 2010). In this context, important health decisions depend on disease estimates and burden, besides political opportunism, donor demands, and occasionally on infrequently repeated national studies like Demographic Health Survey (DHS) which are insensitive to changes occurring over a shorter period. According to Shiferaw *et al,* (2017), decision making in health depends on reliable data as well as human and financial resources which have been invested to improve HIS.

Health information utilization enables free movement of healthcare workers, for instance to conduct community dialogue and outreaches, thus enhancing patients' access to health care (Karuri *et al.,* 2012). This is so because health information utilization also facilitates abundant and timely communication among stakeholders in a health system thus improving service delivery. According to Omole, (2015), a key component of HIS is surveillance in public health whose main focus is identifying problems and taking corrective measures promptly, for instance during epidemics.

1.2 Statement of the problem

In Kenya, data collected at the health facilities are sent to the higher levels in the health systems (MOMS & MOPHS, 2010). This means that data collectors are not the final users of the generated information. At the same time, out of all the data that is collected, only 7% is analyzed, hence the ministry is swamped in data but not information. Even though resources have been allocated for data collection, it is not used to track progress and intervention impact

hence high costs to patients, increased workload to health care providers and low performance on health indicators (MOMS & MOPHS, 2010).

Having acknowledged the critical role played by a functional HIS, in 2010 Kenya's HIS Division at the Ministry of Health was mandated to overhaul the existing system and replace it with the web-based District Health Information Software (DHIS2). DHIS2 was designed to facilitate generation, analysis and dissemination of quality health information for informed decision making (MOH, 2009). Despite introduction of DHIS2, recent evidence has shown very low levels of data demand, access and use by the targeted users in Kenya (Ekirapa *et al.,* 2013). Related findings in a study conducted in Kiambu, Kitui and Mombasa by Kawila & Odhiambo-Otieno, (2019), revealed that healthcare workers were unable to access information or reports from the sub-county in time and that information for returning patients was not easily accessible to all service providers simultaneously. At the same time, information on the cost of health care was not readily available in the HMIS. HIS fundamental principle demands that statistical data and health information be made liberal and readily accessible as a "Public good" and in a timely manner, and also promotes use of existing data (MOH, 2009).

In Mombasa County there is reliance on HIS reports to monitor and evaluate programs and to carry out certain interventions. For instance, at Coast General Teaching and Referral Hospital (CGTRH), demand for use of available information generated by health workers and managers in making decision are at a minimum level (Nzomo, 2017). According to Nzomo, (2017), data quality audits reports done at CGTRH showed incomplete data that is underutilized in making decision and what influences information utilization is not known. The same sentiments are expressed by Kenya Coordinating Mechanism, (2015), which stated that underutilization of health information for decision making has resulted in lack of efficiency and effectiveness in provision of healthcare services in Mombasa County. This is also an under-researched area in Mombasa County since there is little or no documented evidence and literature to show how health information is being utilized in making decision among healthcare managers, specifically.

2.0 LITERATURE REVIEW

2.1 Theoretical Review

The study used the theory of Evidence Based Health Information System by Carbone, (2009). It states that managers require evidence in their managerial duties. This means decisions need to be made based on facts derived from quality generated data. Carbone, (2009), stresses the importance of having Health Information Systems theories that enhance adoption of new technologies in health. Evidence based managerial decision making concepts are not new to health sector even though in health the use is normally confined to medical purposes thus posing a challenge in utilizing information in other aspects of decision making. This theory as well as other relevant authoritative literature suggests that evidence is key in areas that can easily implement and sustain HIS activities.

Health facilities are managed by health workers who are the key decision makers (Carbone, 2009). This informs the need for training all healthcare workers on HIS as well. According to Carbone, (2009), clinicians are scientifically trained in rational way of thinking. This empirical rational way of thinking influences clinical practice behavioral change of a healthcare worker.

The theory further asserts that evidence positively affects one's change in behavior and sustaining the change also depends on the evidence put forward.

Evidence should represent the main business of patient care having in mind the concerns of healthcare givers and health outcomes. Evidence based system should be part of clinical role that has to be performed or improved by adopting HIS. This theory further explains that there is need for a "catalyst" which is responsible for ensuring that the overall clinical care task is performed. From the healthcare givers to the health outcomes, the catalyst should ensure that a set of factors are looked into to allow the task of clinical care achieve the overall health outcome.

The catalyst plays multiple roles to enable evidence-based system to succeed. For instance, it enables clinicians (doctors, nurses, among others) to share information; it ensures that risk management systems exist for patient care; it ensures there is a sound financial system which is equivalent to the task performed and measuring the success of care, which is an improved overall health outcome (Aqil *et al.,* 2009).

2.2 Empirical Review

A well-functioning organization should have systems and infrastructure for improving interpersonal relationship among healthcare workers and managers, providing clear guidelines and defining roles and responsibilities related to HIS thus improving evidence based decision making (Njoka, 2015). As pointed out by Seitio-Kgokwe *et al.,* (2015), lack of feedback mechanisms denies the counties and sub-counties a chance to use their health information to improve service provision. Information generated is supposed to benefit the healthcare management and the facility. Healthcare managers and facilities should be able to get feedback in order to make informed decision. Although reports are submitted to the Ministry of Health (MOH), there are no measures in place to ensure that information regarding the reports is communicated back to the reporting facilities (MOH, 2009). Feedback is, however, necessary to complete the cycle of data reporting and involves behavior, expectations, and styles of communication among others (Seitio-Kgokwe *et al.*, 2015). Availability of feedback influences how health information is utilized by health facilities in making decision (Chaled *et al.,* 2013).

Managers should carry out supervision then communicate reports to the facilities on time in order to take relevant actions that are aimed at improving health information utilization (Teklegiorgis *et al.*, 2016). Karijo, (2013), also reiterates that there is lack of supportive supervision from the county supervisors either due to staff shortage, due to limited capacity of carrying out the supervision or due to lack of resources to do the supervisions. This makes the cycle of data reporting to be incomplete. However, according to Chorongo, (2016), sub-county and county health authorities facilitate supportive supervision to primary level centers to ensure that guidelines are adhered to, skills are reinforced and ultimately high quality services are offered at the facilities.

Resource availability has an influence on routine health information utilization by healthcare institutions (Gopalan *et al.,* 2013). This sentiment is supported by Kihuba *et al.,* (2014), that HMIS departments are generally poorly financed at facility level. On average only 3% of the total annual income (from cost sharing and government grants) is allocated to the HMIS departments with a range of 18% as opposed to a policy requiring that at least 10% should be allocated to HMIS (Kihuba *et al.*, 2014). Even the USAID-Kenya, (2010), noted that there was little allocation of resources for HIS activities, leave alone investment in capacity building and

creation of knowledge management that would facilitate learning and sharing of experiences and best practices

3.0 METHODOLOGY

This was a Descriptive Survey Study design where desired data was obtained from selected respondents by semi-structured questionnaires. The research targeted a total of 303 healthcare managers in Mombasa County which comprises 21 County Health Management Team (CHMT) members, 56 Sub-county Health Management Team (SCHMT) members from the four sub-counties, 43 facility In-Charges from the 43 public health facilities and 183 Heads of Departments (HODs), as shown in Table 1 below.

Table 1: Sampling Matrix

Healthcare Managers	Target Population(N)	Sample Size(n) (30%)
CHMT	21	6.3(6)
SCHMT	56	16.8(17)
IN-CHARGES	43	12.9(13)
HODs	183	54.9(55)
TOTAL	**303**	**90.9(91)**

As recommended by Mugenda & Mugenda, (2003), in a study population that is less than 10,000 a sample size of between 10 and 30% is a good representation of the target population. Therefore, a sample size of 91 healthcare managers was used in the study. Healthcare managers were categorized into four homogenous strata (CHMT, SCHMT, Facility In-Charges and HODs). Multi-stage selection was applied to sample hospitals. A simple random selection to sample health centers and dispensaries was done while Purposive sampling was done to sample the three Sub-County Hospitals (Tudor, Likoni and Portreitz) and Coast General Teaching and Referral Hospital. Being higher level facilities the number of healthcare managers with varied cadres are more than those in the primary level facilities.

Respondents to the study from different health facilities in the county and departments within the facilities were selected through simple random sampling. Semi-structured questionnaire was developed based on the study objective. Validity was established through adequate coverage of the topic under study by the questionnaires and ensuring the instruments contained a representative sample that could be inferred to the rest of the population while Cronbach's alpha was used to measure internal reliability of results.

Results were analyzed using SPSS statistical software. Cleaning, editing, coding, tabulation, interpretations and recording the variables and synthesizing the information from the data collected to make meaning was also done. Managers' responses were rated on a five-point Likert scale. Frequencies/percentages of the responses were obtained and mean and standard deviation calculated to rate their views. The scale had a width of 0.8 [(5-1) ÷ 5].

Descriptive analysis was conducted to summarize the results on the study and inferential analysis was performed to explain the influence of organizational factors on health information utilization in making decision. Results were presented using tables, charts and graphs, followed by interpretations and discussions. Significance level was set at $p < 0.05$. Results were presented in graphs, charts and tables.

4.0 RESULTS AND DISCUSSIONS

4.1 Socio-Demographics of Healthcare Managers

As shown in Table 2 below, 63% of managers are female while 27% are male. This means that majority of the healthcare managers in Mombasa County are female. These results coincide with WHO, (2008), which pointed out that in health sector, women are over 75% of the health workforce making them the backbone of healthcare service delivery. 42% of the managers were between the age of 31-40 years. This means that Mombasa County has young generation healthcare managers. 42% of the respondents had a bachelors' degree. Professionally, 24% were nurses, which is the majority. This means that majority of the managers are nurses. This finding supports MOH, (2017), report that in Kenya, nurses provide the bulk of health workforce. The study findings indicate that 47% of the managers have served in their current managerial positions for between six months to five years, as shown in Figure 1 below. This means that majority of the managers have utmost 5 years working experience as healthcare managers. According to Thakur, (2015), demographic characteristics affect employee performance by evoking differential expectations among them and should, therefore, be seen not as a hindrance but utilized profitably by employers. However, according to Transparency International-Kenya, (2011), socio-demographic characteristics do not influence data use in making decision. This implies that information utilization in making decision is determined by other factors, not one's socio-demographic characteristics.

Table 2*: **Socio-Demographics of Healthcare managers**

| Demographic Characteristics	N
Gender	
Male	30(33%)
Female	60(67%)
Age of the managers	
21- 30	15(17%)
31- 40	38(42%)
41- 50	21(23%)
Above 50	16(18%)
Education level	
Certificate	5(6%)
Diploma	36(40%)
Higher Diploma	6(7%)
Bachelors Degree	38(42%)
Post Graduate Diploma	1(1%)
Masters and above	4(4%)
Professional Background	
Social work and Counseling	3(3%)
Radiology	3(3%)
Public Health	5(6%)
Physical Therapy	1(1%)
Pharmacy	7(7%)
Nutrition and Dietetics	3(3%)
Nursing	22(24%)
Medicine and Surgery	7(8%)
Medical Laboratory	13(14%)
Health records and Information	5(6%)
Dentistry	4(4%)
Clinical Medicine	13(14%)
Administration, HR and Finances	4(4%)
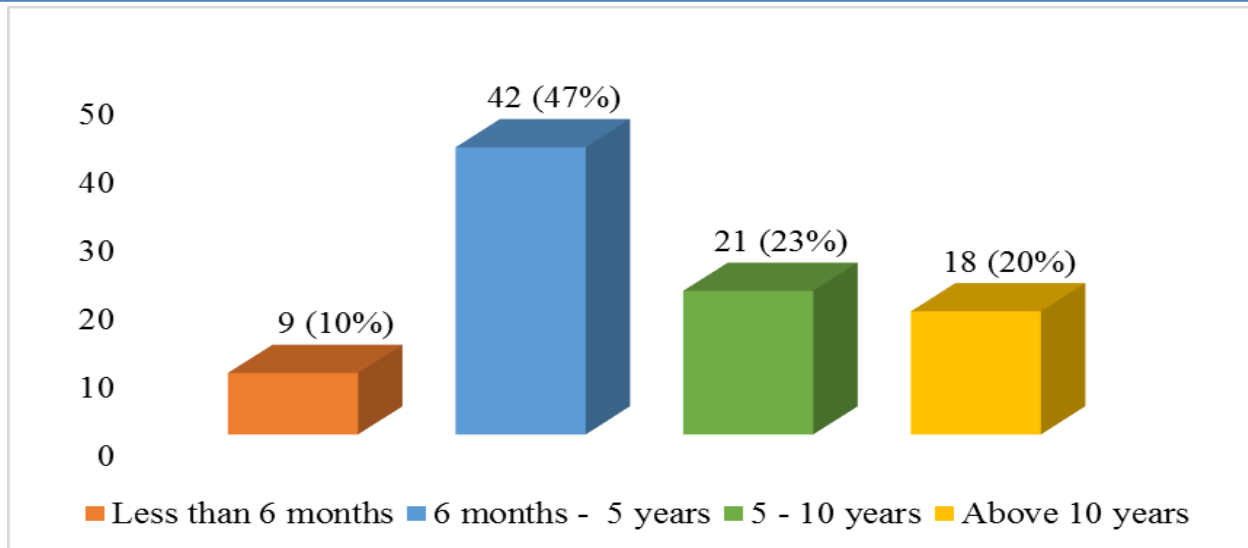
Figure 1: Service Duration of the Respondents

4.2 Organizational Factors

The organizational factors considered in this study included feedback mechanisms on HIS, supportive supervision on HIS and resource availability on HIS activities. The healthcare managers were required to respond to statements concerning availability of feedback mechanisms on HIS, supportive supervision on HIS and resource availability on HIS. The managers' responses were rated on a five-point Likert scale; where 1 depicts Strongly Disagree (SD), 2 depicts Disagree (D), 3 depicts Neutral (N), 4 depicts Agree (A) and 5 depicts Strongly Agree (SA). Frequencies/percentages of the responses were obtained and average and standard deviation calculated rated their views. The scale had a width of 0.8 [(5-1) ÷ 5], therefore, a score between 1 to 1.8 depicted Strongly Disagree, between 1.81 to 2.6 Disagree, between 2.61 to 3.4 Neutral, between 3.41 to 4.2 Agree, and between 4.21 to 5 Strongly Agree. Responses are shown in Table 3.

Table 3: Availability of Feedback Mechanisms, Supportive Supervision and Resources on HIS

	N	SD	D	N	A	SA	Mean	Std. Dev.
There are feedback mechanisms on health information utilization	86	3 / 3%	13 / 15%	15 / 17%	46 / 53%	9 / 10%	3.52	0.991
There is sharing of best practices on HIS	87	4 / 5%	11 / 13%	28 / 32%	38 / 44%	6 / 7%	3.36	0.952
Feedback on HIS is only from the lower level managers to the top level managers	86	17 / 20%	29 / 34%	14 / 16%	19 / 22%	7 / 8%	2.65	1.253
As managers, we hold meetings with stakeholders to discuss HIS	87	4 / 5%	8 / 9%	31 / 36%	39 / 45%	5 / 6%	3.38	0.905
An official record of meetings is maintained	89	3 / 3%	6 / 7%	17 / 19%	50 / 56%	13 / 15%	3.72	0.917
As managers, we review reports on HIS	85	3 / 4%	7 / 8%	16 / 19%	47 / 55%	12 / 14%	3.68	0.941
As a manager I offer supportive supervision on HIS activities	89	5 / 6%	12 / 13%	23 / 26%	36 / 40%	13 / 15%	3.45	1.077
There is recognition and reward systems for good performance on HIS	89	17 / 19%	31 / 35%	22 / 25%	16 / 18%	3 / 3%	2.52	1.099
There is adequate resource allocation for support supervision on HIS (financial, human, infrastructure and supplies)	88	27 / 31%	23 / 26%	22 / 25%	10 / 11%	6 / 7%	2.38	1.225

The study results indicated that 63% of the healthcare managers in Mombasa County agreed (with a mean of 3.52 and standard deviation of 0.991) that there were feedback mechanisms on HIS. Feedback is given in the form of reports from the lower level managers to higher level managers and vice versa. There are those disseminated either weekly, monthly, quarterly or annually. This is contrary to assertions by the MOH, (2009), which stated that although reports from health facilities are submitted to the MOH, there are no mechanisms in place to ensure this information is shared with the reporting facilities. As pointed out by Seitio-Kgokwe *et al.,* (2015), lack of feedback mechanisms denies the counties and sub-counties a chance to use their health information to improve service provision. Information generated is supposed to benefit the healthcare management and the facility. Healthcare managers and the facilities should be able to get feedback in order to make informed decision (Seitio-Kgokwe *et al.,* 2015). The managers' opinions were divided on whether feedback on HIS was only from the lower level managers to the top level managers. Additionally, the managers had varied opinions on whether they hold

meetings with stakeholders to discuss HIS and whether there was sharing of best practices on HIS.

Results also showed that 71% of the managers agreed (with a mean of 3.72 and standard deviation of 0.917) that an official record of meetings held was maintained, and that 69% of the managers agreed (with a mean of 3.68 and standard deviation of 0.941) that they review reports on HIS. This is in tandem with MOH's Health Sector M&E Framework developed to guide counties in developing their own HIS M&E plans and strategic guidelines (MOH, n.d.-b). The framework states that data review and data use should be strengthened at all levels, and stakeholders should discuss ways in which data had been used in the period preceding the meeting to aid in decision-making. Results also established that majority (54%) of the healthcare managers disagreed that there were recognition and reward systems for good performance on HIS, and that there was adequate resource allocation for support supervision on HIS (57%). This supports sentiments by Aqil *et al.,* (2009), that in most developing countries that HIS data is burdened by major problems ranging from inadequate human resources and lack of data ownership occasioned by health workers' perception that the purpose of a HIS is simply to enable submission of reports to the higher levels, leading to a situation where there is no incentive for health workers to analyze, use and interpret health data.

Concerning supportive supervision, 55% of healthcare managers in Mombasa County agreed that they carry out supportive supervision on HIS activities. There is internal supportive supervision at facility level by Health Records and Information Officers (HRIOs) or officers responsible for information management and facility in-charges. External supportive supervision is carried out by Sub-county and County Health Management Team members. This supports assertion by Chorongo, (2016), that supportive supervision is facilitated by sub-county and county management teams. These, however, contravene findings by Karijo, (2013), that there is lack of supportive supervision due to staff shortage, limited capacity to carry out the supervision and lack of resources to carry out the supervision. This implies that with adequate resource availability, healthcare managers are able to carry out supportive supervision. According to Teklegiorgis *et al.*, (2016), managers should carry out supportive supervision then communicate reports to the facilities on time in order to take relevant actions that are aimed at improving health information utilization.

On resource availability to HIS activities, 57% of the healthcare managers in Mombasa County disagreed that there were adequate resources allocated to HIS activities. There is little, if any, funds allocated for HIS activities and not all health facilities in Mombasa County have HRIOs. The results support sentiments by Kihuba *et al.,* (2014), that HMIS departments within heath facilities are inadequately financed where only 3% of the total annual budget is being allocated to the HMIS departments. Even USAID-Kenya, (2010), noted that there was inadequate resource allocation not only for HMIS but also for some simple activities like publications and distribution of reports. Resource availability has an influence on routine health information utilization by healthcare institutions (Gopalan *et al.,* 2013).

Linear regression results shown in Table 4 below indicate that approximately 45.2% of the variation in health information utilization in making decision among healthcare managers in Mombasa County was explained by changes in organizational factors.

Table 4: Regression Model Summary of Organizational Factors on Health Information utilization in making decision

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.673[a]	.452	.432	.285

a. Predictors: (Constant), Feedback Mechanisms on HIS, Supportive Supervision on HIS, Resource Availability on HIS

ANOVA test results shown in Table 5 below indicate that, at 95% confidence level, the regression model (feedback mechanisms, supportive supervision and resource availability on HIS) was significant in predicting health information utilization in making decision among healthcare managers in Mombasa County.

Table 5: ANOVA of Organizational Factors on Health Information utilization in making decision

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	5.581	3	1.860	22.847	.000[b]
	Residual	6.759	83	.081		
	Total	12.340	86			

a. Dependent Variable: Health Information utilization in making decision

b. Predictors: (Constant), Feedback Mechanisms on HIS, Supportive Supervision on HIS, Resource Availability on HIS

Regression coefficients results shown in Table 6 below indicate that organizational factors had significant positive influence on health information utilization in making decision among healthcare managers in Mombasa County. This means that enhancement of feedback mechanisms, improvement of supportive supervision and increased resource availability for HIS activities would contribute to increase in health information utilization in making decision among healthcare managers in Mombasa County.

Table 6: Coefficients of Organizational Factors on Health Information utilization in making decision

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.844	.197		9.359	.000
	Feedback Mechanisms on HIS	.155	.053	.251	2.922	.004
	Supportive Supervision on HIS	.208	.054	.373	3.844	.000
	Resource Availability on HIS	.079	.029	.254	2.672	.009

Dependent Variable: Health Information utilization in making decision

Pearson's correlation test was performed at a $p < 0.05$ level of significance to assess relationship between health information utilization in making decision among healthcare managers in

Mombasa County and the organizational factors. Pearson's product moment correlation test results showed that organizational factors (r = 0.660, p < 0.01) had a significant and moderate positive correlation with information utilization among healthcare managers in Mombasa County. Results are shown in Table 7 below.

Table 7: Product Moment Correlation Matrix

		X	Y
X	Pearson Correlation	1	
	Sig. (2-tailed)		
	N	89	
Y	Pearson Correlation	.660[**]	1
	Sig. (2-tailed)	.000	
	n	89	90

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

Key:

X ☐ Organizational factors (Independent Variable)

Y ☐ Health Information utilization in making decision (Dependent variable)

These results support findings by Chaled *et al.*, (2013), which established that the level of health information utilization in making decision by healthcare institutions is influenced by existence of feedback and access to timely reports. Seitio-Kgokwe *et al.,* (2015), also averred that counties and sub-county facilities have chances of health information utilization to enhance service provision if there are assured feedback pathways. The results also support findings of Gopalan *et al.*, (2013), that human and financial resource availability influence health information utilization by health facilities.

Health Information utilization in making decision

Healthcare managers were required to respond to statements concerning health information utilization in planning and performing various tasks. The managers' responses were scored on a five-point Likert scale as shown in Table 8 below.

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Table 8: Health Information utilization in Planning

	n	SD	D	N	A	SA	Mean	Std. Dev.
Formulation of Health Policies	90	0 0%	3 3%	27 30%	40 44%	20 22%	3.86	0.801
Ensure financial allocation/reallocation based on needs	89	4 5%	8 9%	13 15%	44 49%	20 23%	3.76	1.045
Develop strategies that ensure access to healthcare services	87	5 6%	5 6%	19 22%	43 49%	15 17%	3.67	1.019
Develop strategies for managing epidemics	88	5 6%	4 5%	26 30%	35 40%	18 20%	3.65	1.04
Design disease surveillance strategies	89	1 1%	0 0%	21 24%	60 67%	7 8%	3.81	0.619
Conduct health systems researches	89	1 1%	7 8%	69 78%	12 13%	0 0%	3.03	0.51
In recruitment and selection of human resource for health	90	2 2%	6 7%	35 39%	44 49%	3 3%	3.44	0.766
Medical supplies management	90	1 1%	24 27%	56 62%	7 8%	2 2%	2.83	0.675
Conduct training to staff based on their training needs	90	0 0%	10 11%	38 42%	40 44%	2 2%	3.38	0.712
Develop and implement staff retention strategies	90	0 0%	5 6%	70 78%	14 16%	1 1%	3.12	0.493
Empower individuals with timely relevant health information	90	0 0%	6 7%	77 86%	7 8%	0 0%	3.01	0.382

Results indicate that 66% of the healthcare managers were in agreement that health information was used in formulation of health policies. This supports assertions by Abajebel *et al,* (2011), that healthcare managers should monitor and evaluate measures put in place to formulate and implement policies in order to come up with informed decisions that can achieve set health targets. 64% of the managers agreed that health information ensures financial allocation/reallocation is based on needs, developing strategies that ensure access to healthcare services (58%), developing strategies for managing epidemics (53%), designing disease

surveillance strategies (67%), and in recruitment and selection of human resource for health (75%). These findings support those from a study done by Wekesa, (2014), where she reiterates that an effective HIS has multiple benefits and enables healthcare managers to do the following: Detecting and controlling emerging and endemic conditions; monitoring progress towards attainment of health targets; promoting equity in health; empowering individuals and communities with timely dissemination of health information; enhancing quality of services; strengthening evidence base for formulation of health policies; enabling innovation through research; improving governance and mobilizing and allocating resources and ensuring accountability in resource use. Even Omole, (2015), reiterates that a key component of HIS is surveillance in public health whose main focus is identifying problems and taking corrective measures promptly, for instance during epidemics.

However, a higher proportion of the managers neither agreed nor disagreed whether health information was being used in conducting health systems researches (78%), management of medical supplies (62%), conducting training to staff based on their training needs (42%), developing and implementing staff retention strategies (78%), and empowering individuals with timely relevant health information (86%).

Health Information utilization in Monitoring and Evaluation of Health System's Performance

Healthcare managers were required to respond to statements concerning health information utilization in monitoring and evaluating health system's performance. The managers' responses were scored on a five-point Likert scale as shown in Table 9 below.

Table 9: Health Information utilization in Monitoring and Evaluation

	N	SD	D	N	A	SA	Mean	Std. Dev
Assess staffs' technical competency on HIS	87	4 5%	14 16%	24 28%	32 37%	13 15%	3.41	1.073
To assess staffs' performance on health service delivery	88	4 5%	7 8%	19 22%	47 53%	11 13%	3.61	0.964
To ensure health facilities' performance is based on health information	85	1 1%	7 8%	20 24%	44 52%	13 15%	3.72	0.868
To ensure patients' management is based on health information	90	5 6%	21 23%	32 36%	29 32%	3 3%	3.04	0.959
To ensure resource allocation/reallocation is based on health information	88	3 3%	4 5%	44 50%	32 36%	5 6%	3.36	0.805
To share best practices on the overall health systems performance	90	3 3%	10 11%	45 50%	31 34%	1 1%	3.19	0.777

Results indicate that 52% of the healthcare managers were in agreement that they used health information to assess staffs' technical competency on HIS, to assess staffs' performance on

health service delivery (66%), and to ensure health facilities' performance is based on health information (67%). These findings are in compliance with Health Sector M&E Framework developed by the MOH to guide counties in developing their own HIS M&E plans and strategic guidelines (MOH, 2014). The framework states that data and information generated at all levels of the sector and from different sources will be shared, translated and applied for decision-making during routine monitoring, periodic sector performance review, planning, resource mobilization and allocation, accountability, designing disease-specific interventions, policy dialogue, review and development. It also outlines several reports and the data that should be presented in those reports, including the Annual Health Sector Performance Report (2013–2014), a report compiled and disseminated by the Division of Health Informatics and M&E that provides health outcomes data, achievements against different health goals, and funding allocations for the past year.

However, a higher proportion of the managers neither agreed nor disagreed whether they used health information to ensure patients' management is based on health information (36%), to ensure resource allocation/reallocation is based on health information (50%), and to share best practices on the overall health systems performance (50%).

5.0 SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Summary of findings

The study's specific objective was to examine organizational factors which influence health information utilization in making decision among healthcare managers in Mombasa County. The organizational factors considered in this study included, feedback mechanisms on HIS, supportive supervision on HIS and resource availability for HIS activities. Regression analysis of organizational factors on health information utilization in making decision revealed that, at $p<0.2$ level of significance, feedback mechanisms on HIS ($\beta_1 = 0.155$; $t = 2.922$; $p < 0.01$), supportive supervision on HIS ($\beta_2 = 0.208$; $t = 3.844$; $p < 0.01$) and resource availability on HIS ($\beta_3 = 0.079$; $t = 2.672$; $p < 0.01$) had significant positive influence on health information utilization in making decision among healthcare managers in Mombasa County. Further tests using product moment correlation ($r = 0.660$, $p < 0.01$) and multiple regression analysis ($\beta_2 = 0.233$; $t = 4.552$; $p < 0.01$) indicated that, at a $P<0.05$ level of significance, organizational factors was significant statistically and had a positive influence on health information utilization in making decision among healthcare managers in Mombasa County. This means that when feedback mechanisms are improved, supportive supervision is enhanced and resource availability is increased, health information utilization in making decision among healthcare managers in Mombasa County would increase.

Healthcare managers in Mombasa County utilize health information to: formulate health policies; ensure financial allocation/reallocation is based on needs; develop strategies that ensure access to healthcare services; develop strategies for managing epidemics; design disease surveillance strategies; and in recruitment and selection of human resource for health. In monitoring and evaluation, the managers utilize health information to assess staffs' technical competency on HIS, to assess staffs' performance on health service delivery, and to ensure health facilities' performance is based on health information.

5.2 Conclusion

Healthcare managers are key decision makers in health systems. They, therefore, require evidence based systems which should be part of clinical role that has to be performed or improved by adopting HIS. Approximately 45.2% of the variation in health information utilization in making decision among healthcare managers in Mombasa County was explained by changes in organizational factors (available feedback mechanisms on HIS, supportive supervision on HIS and resource availability on HIS). It is evident that healthcare managers in Mombasa County have feedback mechanisms on health information utilization as well as sharing of best practices on HIS. However, the study could not establish whether or not the feedback was only from lower level managers to top managers at the county since the respondents had varied opinions on this. The healthcare managers also conduct support supervision on HIS activities. However, these activities are hindered by inadequate resource allocation for the same.

Health information utilization in making decision among healthcare managers in Mombasa County would increase if there are available adequate healthcare managers trained on HMIS; enhanced feedback mechanisms; improved supportive supervision and increased availability of resources for HIS activities. When this is done, there will be an improved overall health outcome in Mombasa County and beyond.

5.3 Recommendations

The MOH should include HMIS as a subject in the pre-service curriculum for all healthcare cadres. Mombasa County Government should ensure support supervision on HIS among healthcare managers is consistently carried out and feedback given to ensure that correct and timely information is available during decision making. The MOH and Mombasa County Government should allocate more resources for effective implementation of HIS activities.

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