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Utilization of Healthcare Information Among Healthcare Workers in Gucha Subcounty, Kisii County, Kenya

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Abstract

Utilization of health information is important in the provision of efficient and effective healthcare services. It is a major public health component in the ministry of health which informs decisions for efficient and effective healthcare. It involves generation, collection and analysis and use in identifying gaps in health systems to prompt planning for appropriate health interventions or actions to promote healthy. It is used for planning health projects and priority activities, budget allocations, research, monitoring and evaluation, Educcation and health policy development. The objective of this study was to determine utilization of health information among healthcare workers in Gucha Sub County, Kisii County. This was an observational study which utilized descriptive cross-sectional study design using quantitative methods of data collection to assess utilization of health information among healthcare workers in Gucha Sub County, Kisii County. The study was conducted among healthcare workers offering healthcare services in the health facilities in Gucha Sub County. The sample size was determined by use of fisher's formula. It was deployed stratified and quota sampling methods to reach the subjects of study. Interview schEducles were designed with structured questions to collect the data after pretesting the tool and training research assistants on its application. Analysis was done using statistical package for social scientist (SPSS). The study found that data and information were managed by nonprofessionals due to inadequate health information specialists, consequently this compromised quality and use of information. Availability and accessibility were highly hampered due to inadequacy of training and electronic systems in use. From the study it was recommended that health workers to be trained in use of data tools and ICT system infrastructure be installed. Employing more health workers was important as well as developing health information policy to enhance the use information in Gucha Sub County.

Keywords: Public health; Health Educcation; Health care

Chapter One

Background information

Health information system provides health data defined as any facts, numbers, or text about health of the people [1]. Nothing exists until it is documented and measured or counted for evidence [2]. Data collection and analysis reveals patterns, trends, associations or relationships which provide information in the form of maps, globes, reports and charts for use by healthcare workers to promote health of the community. According to [3], understanding of these results is knowledge to be applied for action or interventions. Information management is a basis of production of knowledge and translation of health system decision making. There are three categories of information healthcare workers can use:

- Health services information from healthcare services and disease surveillance
- Management information; about logistics and supplies, finance, human resources and physical assets
- Population based information which is on vital registration and census, operation research, surveys and rapid assessment [4].

At individual and community levels, information is needed by healthcare workers for efficient and effective clinical management; assessing the extent to which services are meeting the needs and demands of communities. This ensures availability and equitable distribution of health resources and provision of interventions to rEducce disease burdens through prevention strategies.

At the district level, health information enables healthcare workers to take decisions regarding the effective functioning of health facilities and of the health system as a whole and at higher levels; health information is needed for strategic policy-making and resource allocation.

According to [5], health information has been variously described as the "foundation" for better health, as the "glue" holding the health systems together and as the "oil" keeping the health systems running. There is however a broad consensus that a strong health information system (HIS) is an integral part of the health system as a whole, the operational boundaries of which include: all resources, organizations and actors that are involved in the regulation, financing, and provision of actions whose primary intent is to protect, promote or improve health.

In Africa countries are leveraging technology to create interoperable health information systems. Interoperability allows different branches of a health information system using different software to tap into each other's' databases to harvest useful information, improving quality and completeness of data in each sector [6]. Some countries are using EMR, EHR and DHIS for collection, analysis, sharing information and knowledge for health information system strengthening throughout the region. Information system managers, decision-makers, developers

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of open source software for health information systems and other stakeholders are involved in strengthening health information systems [6].

According to [7], in Kenya most health facilities are using paper based health information system. The Districts and referral hospitals are using District Health Information Software and some use Electronic Medical Records (EMR) and Electronic Health Records (EHR). Health Information System (HIS) is one of the most powerful investments one can make to improve your ability to show evidence of one's progress. Kenya faces greatest challenges in collecting, analyzing, evaluating and interpreting indicator data to guide evidence based policy-making [8].

In Gucha District, health information system uses District health information software (DHIS) and Electronic Medical Records whereas health facilities (health centres and dispensaries) use paper based and level four hospitals use EMR and DHIS [9].

Statement of the problem

Health information systems are important for a well-functioning health system because of increased accountability for resource allocations and the need for measuring health outcomes. Health information is a product of health information system which is essential in any health organization intending to achieve its objectives because it is the intelligence to monitor the health status; commodity supply/ distribution, disease surveillance, staffing levels, services to improve public health leadership and management at all levels. For information to be used effectively should be available, accessible, of quality, and there should be knowledge for its applications and user-friendly [10].

In Gucha sub county data/ information utilization rate is only 30% [11]. This is very low usage of data/information to make informed decisions. This has led to inequity in allocation of resources and poor planning for provision of essential healthcare services. This low utilization rate of health information in planning has increased essential drug stock outs and other commodities such as RDTs for malaria diagnosis and expiries of some drugs due to overstocking. Consequently, there is inefficiency and ineffectiveness in healthcare service provision by healthcare workers which includes disease surveillance, commodity supply, staffing and many others. This is evident in the distribution of healthcare workers which is 12%, 20% and 30% in hospitals, health centers and dispensaries respectively. This is far below and unacceptable as per health staffing norms [12].

There are no innervations planned using information to improve low performance in health indicators such as 4th ANC visits which is at 40%, malaria prevalence 20%, and HIV/AIDs 8.9% [13]. Annual work plan (AWP) and annual operational plan (AOP) implementation rate is between 40% and 50% for year 2012.

The supply and demand in the health information field are not currently in equilibrium, with an oversupply of data coexisting with large unmet needs for information. Whereas large amounts of data are collected at various levels of the system, relatively little is actually used for decision-making. Demand for health information should come not only from the health sector but also, and perhaps more critically, from other sectors (notably finance and planning) as well as from civil society, including parliamentarians, communities, consumer groups, and non-governmental organizations. Health information is much more than the collecting of data. Data have no value in themselves. The value and relevance come only after analysis, transformation into meaningful information use.

Chapter Two

The study area/site

The study was conducted in health facilities in Gucha Sub County within its four administrative divisions; Ogembo, Nyamache, Kenyan and Sameta. This study included 14 health facilities in Kenyan Division, 12 in Ogembo, 13 in Nyamache, and 13 in Sameta respectively. The Sub County had 270 healthcare workers offering healthcare services of who 160 were interviewed.

Research design

Cross-sectional study design was used to assess utilization of health information among healthcare workers in Gucha Sub County, Kisii County. Health facilities were visited once and different cadres of healthcare workers including: nurses, doctors, clinical officers, records officers, laboratory technicians, public health officers, health administrative officers and nutrition officers were interviewed using a structured questionnaire.

Study population

The population of healthcare workers in Gucha Sub County was 270 in 52 health facilities. The healthcare workers from primary facilities and hospitals were 125 and 145 respectively. There were 4 level 4, 4 level 3 and 4 level 2 facilities in the sub county. The distribution of health workers per division was as follows: Kenyanya Division-60, Gucha-98, Nyamache-71 and Sameta-41 respectively. Out of 270 healthcare workers, 160 were interviewed for this study. Averagely dispensaries (level 2) had one health worker in each and only 1 was interviewed. The cadres interviewed were as follows: Nurses-58, Clinical officers-21, Public health officers-18, Laboratory officers-17, Health records and information officers-14, Counselors-13, Nutritionists-5, Doctors-5, Pharm Tech-4, Administrators-2 and radiographers.

Sample size determination

This was a descriptive study design, which used quantitative methods of data collection. Sampling was non probability; convenience sampling in study sites and data collection was done by trained research assistants. The sample size was determined by Fischer method as follows:

The population of >10000 is given as; Sample size, $n=[z^2pq]/d^2$, Where Z=standard normal deviate at 95% Confidence Interval=1.96

p=50% or 0.5

q=1-p or q=1-0.5=0.5

d=desired precision level or allowed standard error=+5%

This gives: $n=[1.962 \times 0.5 \times 0.5]/0.052=384.16$

ii) But targeted population was below 10,000, so the final sample size (nf) was calculated as follows using rEducction method:

$nf=n/[1+(n/N)]$

where N=sample frame=270 and n=sample size

This gives: $nf=384/[1+(384/270)]$ Therefore, nf=158

Approximately 160 respondents were interviewed.

iii) Sample size calculation using stratified method for each division, hospital, health centres and dispensaries because of different distributions of healthcare workers was done as shown below:

1 (i) KENYENYA DIVISION=60/270 × 160=36 respondents

(ii) Hospital respondents=125/270 × 36=17

(iii) Dispensaries and health canters respondents=145/270 × 36=19

2 (i) OGEMBO DIVISION=98/270 × 160=58 respondents

(ii) Hospital respondents=125/27 × 58=27

(iii) Dispensaries and health centres respondents=125/270 × 58=31

3 (i) NYAMACHE DIVISION=71/270 × 160=42 respondents

(ii)Hospital respondents=125/270 × 42=19

(iii)Dispensaries and health centres respondents=145/270 × 42=23

4 (i) SAMETA DIVISION=41/270 × 160=24 respondents

(ii)Hospital respondents=125/270 × 24=11

(iii) Dispensaries and health centers respondents=145/270 × 24=13

Total=36+58+42+24=160 respondents

Sampling procEducre: Purposive sampling was used to identify the study participants and proportionate sampling was used to recruit study participants from the health facilities.

Study instruments

The structured questionnaires were used in interview study participants and the focus was on (state variables in your questionnaire). The interview was conducted in English and the duration was 15 minutes per respondent.

Data collection procEducres

The interview schEducle was piloted among 16 healthcare workers (10% of the total study participants (160) in Gucha sub county health facilities before it was applied to the main study participants. This enabled identification of gaps in the tool and led to its improvement to meet the needs of the study. The questionnaire was administered to all participants by principal investigator. To maintain confidentiality and ensure the identities of all participant's questionnaire was kept under lock and key. Identification codes were given to respondents before entry of data into the computer for analysis.

Data analysis

Data was entered into MS Access database 2010, and was analyzed using Statistical Package for Social Sciences (SPSS V 17) computer program. Social and demographic characteristics were summarized by frequencies and percentages. A p-value of less than 0.05 was considered statistically significant. Baseline association and differences in relation to the outcome were assessed using chi-square, anova and T-test. Results were presented in tables for comparisons, patterns and trends.

Ethical consideration

The study was approved by the ethical committee of Barton Ethics Committee (Appendix 3). During the study the objective was explained to the participants and autonomously agreed to participate. All participants gave informed consent before participating in the study.

Chapter Three: Results

Facility type and the respondents

The study identified 160 healthcare workers who participated in the study from three levels/type of health care; level 4 (Hospitals), level 3 (Health Centers) and level 2 (Dispensaries). The interview was conducted at facility level and the results of the study were as follows: the majority 46% (n=74) interviewed were from level 4. The least 26% (n=42) and 28% (n=44) were working in level 2 and level 3 respectively. The chi-square statistics was 85.9513, the P-value was <0.0001. This result was significant at p<0.05. The highest 36% (58) number of respondents and least 15% (n=24) were from Ogembo and Sameta Divisions respectively. The p-value is 0.00064. This was significant at=<0.05 or 5%. Primary facilities coverage was 86%, while hospital was 86% respectively. The p-value was 0.034. The result is significant at p<0.05. The proportion of hospitals or primary facility responses for observation 1 is 0.74. The proportion for observation 2 is 0.86 (Table 1).

Facility type and staff cadre

Among the respondents the highest number 36% (n=58), of healthcare workers interviewed were nurses followed by clinical officers 13% (n=21), Public health officers and laboratory officers, sharing 11% (21) each and records officers 9% (14). The five together added up to 80% (n=130). Most 47% (n=76) respondents were from hospitals, while the rest 53% (n=53) were from health centers and dispensaries. The health informatics officers involved in the study were 12 (7.5%) and the rest were 88 (92.5%). The p-value is <0001. The result was significant at p<0.05 (Table 2).

Accessibility and capacity to analyze data

Among the respondents, 66% (105) accessed, analyzed and used information while 34% (n=55) did not. The p-value is <0.001. The result is significant at p<0.05. The proportion for yes (use) or no (nonuse) responses for observation 1 is 0.66 and 2 is 0.34 respectively.

The highest cadre 23% (n=37) who analyzed data used information were nurses and clinical officers 9% (n=14). Health records and information officers who did analysis were 6% (n=10). The p-value is <0.001. The result is significant at p<0.05 (Table 3).

Divisions	Hospital	Health Centre	Dispensary	Total
Nyamache	19(11.9%)	12(8%)	11(7%)	42(26%)
Ogembo	27(16.9%)	11(7%)	20(13%)	58(36%)
Kenyenya	17(10.6%)	11(7%)	8(5%)	36(23%)
Sameta	11(6.9%)	8(5%)	5(3%)	24(15%)
Total	74(46%)	42(26%)	44(28%)	160(100%)

Table 1: Facilities type and respondents per division.

Health workers	Hospital	Health Centre	Dispensary	Total (%)
Nutritionist	3(1.9%)	1(0.6%)	1(0.6%)	5(3.1%)
Pharm Tech	3(1.9%)	1(0.6%)	0(0%)	4(2.5%)
Radiographers	1(0.6%)	0(0%)	0(0%)	1 (0.6%)
Administrator	2(1.3%)	0(0%)	0(0%)	2(1.3%)
Nurse	23(14.4%)	15(9.4%)	20(12.5%)	58(36.3%)
Clinical Officers	9(5.6%)	7(4.4%)	5(3.1%)	21(13.1%)
Health Record & I	9(6.9%)	2(1.3%)	1 (0.6%)	12 (7.5%)
PHO	5(3.1%)	5(3.1%)	8(5%)	18(11.3%)
Counselors	7(4.4%)	4(2.5%)	2(1.3%)	13(8%)
Doctors	5(3.1%)	0(0%)	0(0%)	5(3.1%)
Data Clerks	2(1.3%)	1(0.6%)	1(0.6%)	4(2.5%)
Lab Officers	5(3.1%)	6(3.8%)	6(3.8%)	17(10.6%)
Total	74(46.3%)	42(26.3%)	44(27.5%)	160(100%)

Table 2: Facility type and staff cadre involved in the interview.

Generation, accessibility and use information

Most 44% (n=71) and 33% (n=53) of service providers and partners respectively generated information. On the other hand, service providers and partners used 11% (n=17) and 8% (n=13) information respectively. The p-value between use and generation was <0.001 and <00.01 respectively. This was significant at p<0.05. The highest users of the information were: The Government and Policy makers 38% (n=61) and 40% (n=64) respectively. The Government was the second highest 38% (n=61) user but generated 15% (n=24). The p-value was 0.00022. This was significant at p<0.05 or 5%. The service providers generate highest 44% (n=71) but used very little 11% (n=22). The p value was <0001. This was significant at p<0.05. In general, the service providers used very little 11% information while the rest of used 86%. The p-value <0001. This was significant at p<0.05. The statistical test result of the comparison between means of who generated the information and who used were: The P-value anova one way was 0.041. This was significant anova result at p<0.05 or 5% (Table 4).

Accessibility of information for interventions

The healthcare worker require information on disease out breaks and morbidity rate 41% (n=65) and mortality rates 17% (n=27). They need very little 2% (n=3) for financial information. The p-value from chi-square is 0.014083. The result is significant at p<0.05 (Table 5).

Knowledge in computer to enable access to information

Overall respondents on computer knowledge were 36% (n=60) and without 64% (n=100). The majority who had computer knowledge were nurses 9.4%. They were also the majority 26.9% (n=43) without computer knowledge. The p-value was 0. This was significant at p<0.05 or 5%. The least 1% with or without computer knowledge were both pharmacists and radiographers. Those with computer knowledge 36% (n=60) and without 64% (n=100). The p-value is 8E-05. The result is significant at p<0.05 (Table 6).

Knowledge through training

Among the respondent's nurses were the leading 36% (n=58) in health information system training, followed by clinicians 9% (n=21) and the least were doctors, nutritionist, radiographer, administration and health records and information officers each 1% (n=3). Respondents who underwent training in health information systems were 56% (n=90) and 44% (n=70) did not. The chi-square p-value is 0.000487. The result is significant at p<0.05 (X2=66.5 and DF=33). Respondents least trained were in the area of analysis and computer software; 5% (n=8) and 12% (n=19) (Table 7).

Availability information using systems

The most used systems in health facilities was paper based 57% (n=91) and hybrid (paper and electronic) 43% (n=69). The p-value is 0.0477. The result is significant at p<0.05. The proportion observation 1 is 0.57 and proportion for observation 2 is 0.43.

There was no single facility with the use of pure electronic system in the sub counties. However, hospitals were leading in use of both paper and hybrid systems 21% (n=33) and 26% (n=41) respectively. The chi-square p-value is 0.043935 (where: X2=9.8 and DF=4). The result is significant at p<0.05 (Table 8).

The purpose of the available information

Among the uses of the information generated was forwarding to Government 51% (n=82), while use for research is 19% (n=30), health

Staff cadre	Yes	No	Total
Nutritionist	5(3.1%)	0(0%)	5(3.1%)
Pharm Tech	2(1.3%)	2(1.3%)	4(2.5%)
Radiographers	1(0.6%)	0(0%)	1(0.6%)
Administrator	1(0.6%)	1(0.6%)	2(1.3%)
Nurse	37(23.1%)	21(13.1%)	58(37.3%)
Clinical Medicine	14(8.8%)	7(4.4%)	21(13.1%)
Health Record	10(6.3%)	2(1.3%)	12(7.5%)
PHO	12(7.5%)	6(3.8%)	18(11.3%)
Counselors	8(5%)	5(3.1%)	13(1.9%)
Data clerks	3(1.9%)	1(0.6%)	4(2.5%)
Doctors	3(1.9%)	2(1.3%)	5(3.1%)
Laboratory Officers	9(5.6%)	8(5%)	17(3.1%)
Total	105(66%)	55(34 %)	160(100%)

Table 3: Accessibility, analysis of data and use of information.

Stakeholders	Producers	Users
Government	24(15%)	61(38%)
Partner	53(33%)	13(8%)
Service Provider	71(44%)	17(11%)
Policy Maker	3(2%)	64(40%)
Patient	8(5%)	0(0%)

Table 4: Accessibility and use information.

Staff cadre	Mortality Rates	Morbidity Rates	Disease outbreaks	Finance	Total
Nutritionist	2(1.3%)	3(1.9%)	0(1.9%)	0(0%)	5(3.1%)
Pharm Tech	0(0%)	1(0.6%)	4(2.5%)	0(0%)	5(3.1%)
Radiographers	1(0.6%)	0(0%)	0(0%)	0(0%)	1(0.6%)
Administrator	0(0%)	0(0%)	1(0.6%)	1(0.6%)	2(1.3%)
Nurse	7(4.4%)	25(15.6%)	25(15.6%)	0(0%)	57(35.6%)
Clinical Medicine	3(1.9%)	9(5.6%)	8(5%)	1(0.6%)	21(13.1%)
Health Record	4(2.5%)	4(2.5%)	4(2.5%)	0(0%)	12(7.5%)
PHO	3(1.9%)	4(2.5%)	11(6.9%)	0(0%)	18(11.3%)
Counselors	2(1.3%)	6(3.8%)	5(3.1%)	0(0%)	13(8.1%)
Data clerks	1(0.6%)	2(1.3%)	1(0.6%)	0(0%)	4(2.5%)
Doctors	0(0%)	3(1.9%)	2(1.3%)	0(0%)	5(3.1%)
Laboratory Off	4(2.5%)	8(5%)	4(2.5%)	1(0.6%)	17(10.6%)
Total	27(16.9%)	57(40.3%)	65(40.3%)	3(1.9%)	160(100%)

Table 5: Accessibility of information for interventions.

Staff cadre	Yes	No	Total
Nutritionist	2(1.3%)	3(1.9%)	5(3.1%)
Pharm Tech	2(1.3%)	2(1.3%)	4(2.5%)
Radiographers	1(0.6%)	0(0%)	1(0.6%)
Administrator	0(0%)	2(1.3%)	2(1.3%)
Nurse	15(9.4%)	43(26.9%)	58(36.3%)
Clinical Officers	8(5.0%)	13(8.1%)	21(13.1%)
Health Record	10(6.3%)	2(1.3%)	12(7.5%)
PHO	8(2.5%)	10(5.0%)	18(11.3%)
Counselors	4(2.5%)	9(5.6%)	13(8.1%)
Data clerks	3(1.9%)	1(0.6%)	4(2.5%)
Doctors	2(1.3%)	3(1.9%)	5(3.1%)
Laboratory Officers	5(3.1%)	12(7.5%)	17(10.6%)
Total	60(36%)	100(64%)	160(100%)

Table 6: Computer knowledge among respondents.

Educcation 11% (n=17) and none use is 1% (n=1). The total highest three uses are 81% (n=129).

The effective use of information was 77(48.1%) and none effective use was 83(51.9%). The p-vale is 0. The result is significant at p<0.05 (Table 9).

Availability of health information tools

Among the respondents, largest proportion 78% (n=125) experienced shortages of data tools, while small proportion 22% (n=35) experienced no shortages. The p-value is 0. The result is significant at p<0.05. The majority 31% (n=50) were nurses and the minority 0.6% (n=1). The p-value is <0.0001. The result is significant at p<0.05 (Table 10).

Training, systems and level of Educcation for quality

The systems in use by most 58% (n=93) health workers in all level Educcation was paper based and the hybrid 42% (n=67). The p-value is 0.02382. The result is significant at p<0.05. The proportion observation 1 is 0.58 and proportion for observation 2 is 0.42. Most 77.5% (n=124). The health workers trained were those who qualified from middle colleges and the least 1(0.6%). The p-value is 0. The result is significant at p<0.05. Most 40% (n=64) health workers under went tools training, the least 11.9% (n=19) did software. The p-value is <0001. The result is significant at p<0.05. Generally, 57% (n=91) were trained and 43% (n=69) never received any training at all. The p-value is 0.0477. The result is significant at p<0.05. The proportion observation 1 is 0.57 and proportion for observation 2 is 0.43. Training in analysis was very low 5% (n=8) compared to rest 52% (n=83). The p-value is 0. The result is significant at p<0.05. The proportion observation 1 is 0.52 and proportion for observation 2 is 0.05 (Table 11).

Ensuring data quality

The responses on ensuring data quality 93% (n=149), while those who did not anything about was 7% (n=11). The p-value for both is 0. The result is significant at p<0.05. The proportion of yes or no responses for observation 1 is 0.93. The proportion for observation 2 is 0.07. The most 37% (n=59) used methods to disseminate information was by sharing followed by validation checks 22% (n=35), DQAs 14% (n=14) and supervision 13% (n=21) among best four. The four together contribute a proportion of 86% (n=138) and least therefore 14%. The p-value is 0. The result is significant at p<0.05. The proportion of observation 1 is 0.86, while for observation 2 is 0.014. The chi-square statistical results are significant; p-value is 0.046 at p<0.05. The anova F (5,66)=3.14 at 0.05 since F=34.4>3.4 the results are significant at 5% significance level. The p-value for this test is < 0001 (Table 12).

Guidelines M and E framework

The table shows that availability of the guidelines and framework was 0% and 0% respectively among the respondents. The p-value for both is <0.0001. The result is significant at p<0.05. The proportion of yes or no responses for observation 1 is 1. The proportion for observation 2 is <0.0001 (Table 13).

Specialty and responsibility for quality of data

The highest proportion 66% (n=106) were responsible for data and information among the respondents and those not responsible 34% (n=54). The p-value is <0.0001. The result was significant at p<0.05.

The nurses were the majority 38% (n=60) and the health records and information officers were the fewest 8% (n=13). The p-value is <0.0001 the result is significant at p<0.05. The proportion of yes or no responses for observation 1 is 0.38. The proportion for observation 2 is 0.08. The clinical officers form 13% (n=20) and the public health officers 10% (n=16) respectively among the respondents. The four cadres together form 69% (n=109), while the rest was 31% (n=59). The p-value was 0. This was significant at p<0.05 or 5% (Table 14).

Staff cadre	Tools training	Analysis Training	Software Training	None	Total
Nutritionist	3(1.9%)	0(0%)	1(0.6%)	1(0.6%)	5(3.1%)
Pharm Tech	0(0%)	0(0%)	0(0%)	4(2.5%)	4(2.5%)
Radiographers	0(0%)	0(0%)	1(0.6)	0(0%)	1(0.6%)
Administrator	0(0%)	1(0.6%)	0(0%)	1(0.6%)	2(1.3%)
Nurse	31(19.4%)	4(2.5%)	5(3.1%)	18(11.3%)	58(36.3%)
Clinical Off	8(5.0%)	1(0.6%)	3(1.9%)	9(5.6%)	21(13.1%)
Health Record	9(5.6%)	0(0%)	1(0.6%)	2(1.3%)	12(7.5%)
PHOs	7(4.4%)	0(0%)	2(1.3%)	9(5.6%)	18(11.3%)
Counselors	2(1.3%)	0(0%)	1(0.6%)	10(6.3%)	13(8.1%)
Data clerks	0(0%)	0(0%)	1(0.6%)	3(1.9%)	4(2.5%)
Doctors	0(0%)	1(0.6%)	3(1.9%)	1(0.6%)	5(3.1%)
Lab Officers	3(1.9%)	1(0.6%)	1(0.6%)	12(7.5%)	17(10.6%)
Total	63(39.4%)	8(5.0)	19(11.9%)	70(43.8%)	160(100%)

Table 7: Acquiring knowledge through training.

Type of system	Hospital	Health Centre	Dispensary	Total
Paper	33(21%)	27(17%)	31(19%)	91(57%)
Electronic	0(0%)	0(0%)	0(0%)	0(0%)
Hybrid	41(26%)	17(11%)	11(7%)	69(43%)
Total	74(46%)	44(28%)	42(26%)	160(100%)

Table 8: Systems for availability of information.

Chapter Four: Discussion

This study was health facility based, assessing utilization of health information among healthcare workers. It revealed that the majority of healthcare workers managing data/information were nonprofessionals in health informatics; the nurses, clinical officers, Public health officers and the others. These results concurred with the findings in the Case study of Vanuatu on health information system in the Pacific [14]; the nurses were overloaded with a lot of work in their profession and on data collection and analysis due inadequacy of health records and information staff. In the study it was observed that there was no enough attention paid to information in many countries [15].

Health systems' personnel responsible for data collection and analysis were undervalued, under skilled and under staffed. This led to unprofessionalism practices in health information which compromised quality of data and information, consequently making it unworthy for decision making. The nurses who were the majority in the field of health information did not have skills and analytic knowledge to enable them convert data into information for effective use.

Staff cadre	Research	Sending to MOH	Decision	Health Educcation	Detect Trends	none	Total
Nutritionist	1(0.6%)	1(0.6%)	1(0.6%)	2(1.3%)	0(0%)	0(0%)	5(3.1%)
Pharm Tech	1(0.6%)	2(1.3%)	0(0%)	0(0%)	1(0.6%)	0(0%)	4(2.5%)
Radiographers	0(0%)	1(0.6%)	0(0%)	0(0%)	0(0%)	0(0%)	1(0.6%)
Administrator	0(0%)	2(1.3%)	0(0%)	0(0%)	0(0%)	0(0%)	2(1.3%)
Nurse	13(8.1%)	27(16.9%)	6(3.8%)	5(3.1%)	7(4.4%)	0(0%)	58(36.3%)
Clinical Off	4(2.5%)	13(8.1%)	2(1.3%)	1(0.6%)	1(0.6%)	0(0%)	21(13.1%)
Health Records	4(2.5%)	6(3.8%)	1(0.6%)	1(0.6%)	0(0%)	0(0%)	12(7.5%)
PHO	2(1.3%)	9(5.6%)	1(0.6%)	3(1.9%)	2(1.3%)	1(0.6%)	18(11.3%)
Counselors	2(1.3%)	6(3.8%)	1(0.6%)	2(1.3%)	2(1.3%)	0(0%)	13(8.1%)
Data clerks	0(0%)	3(1.9%)	1(0.6%)	0(0%)	0(0%)	0(0%)	4(2.5%)
Doctors	0(0%)	5(3.1%)	0(0%)	0(0%)	0(0%0	0(0%)	5(3.1%)
Lab Officers	3(1.9%)	7(4.4%)	1(0.6%)	2(1.3%)	4(2.5%)	0(0%)	17(10.6%)
Total	30(18.8%)	82(51.3%)	14(8.8%)	16(10%)	17(10.6%)	1(0.6%)	160(100%)

Table 9: Purpose of available information.

Staff cadre	Yes	No	Total
Nutritionist	2(1.3%)	3(1.9%)	5(3.1%)
Pharm Tech	3(1.9%)	2(1.3%	5(3.1%)
Radiographers	1(0.6%)	0(0%)	1(0.6%)
Administrator	2(1.3%)	0(0%)	2(1.3%)
Nurse	50(31.3%)	7(4.4%)	57(35.6%)
Clinical Medicine	16(10%)	5(3.1%)	21(13.1%)
Health Record	10(6.3%)	2(1.3%	12(7.5%)
PHO	15(9.4%)	3(1.9%)	18(11.3%)
Counselors	10(6.3%)	3(1.9%)	13(8.1%)
Data clerks	2(1.9%)	2(1.3%)	4(2.5%)
Doctors	3(1.9%)	2(1.3%)	5(3.1%)
Lab Officers	11(6.9%)	6(3.8%)	17(10.6%)
Total	125(78.1%)	35(21.9%)	160(100%)

Table 10: Availability/in availability of health information tools.

Level of Educcation			Information system			Total
			paper	Electronic	Hybrid	
Primary	Health information Training	Tool training	0(0%)	0(0%)	1(.6%)	1(0.6%)
	Total		0(0%)	0(0%)	1(0.6%)	1(0.6%)
Secondary	Health information Training	Tool training	0(0%)	0(0%)	1(0.6%)	1(0.6%)
		Software Training	0(0%)	0(0%)	1(0.6%)	1(0.6%)
		None at all	1(0.6%)	0(0%)	0(0%)	1(0.6%)
	Total		1(0.6%)	0(0%)	2(1.3%)	3(1.9%)
College	Health information Training	Tool training	35(21.9%)	0(0%)	17(10.6%)	52(32.5%)
		Analysis Training	3(1.9%)	0(0%)	3(1.9%)	6(3.8%)
		Software Training	3(1.9%)	0(0%)	5(3.1%)	8(5%)
		No training	39(24.4%)	0(0%)	19(11.9%)	58(36.3%)
	Total		80(50%)	0(0%)	44(27.5%)	124(77.5%)
University	Health information Training	Tool training	4(2.5%)	0(0%)	6(3.8%)	10(6.3%)
		Analysis Training	0(0%)	0(0%)	2(1.3%)	2(1.3%)
		Software Training	5(3.1%)	0(0%)	5(3.1%)	10(6.3%)
		No training	3(1.9%)	0(0%)	7(4.4%)	10(6.3%)
	Total		12(7.5%)	0(0%)	20(12.5%)	32(20%)
	Grand Total		93(58%)	0(0%)	67(42%)	160(100%)

Table 11: Training type, system used and level of duration for quality improvement.

In most facilities, there were no health records and information officers deployed while the nurses were at least two in each primary facility [14], identified and recommended that there was a large and urgent need to recruit skilled health information system workforce in both the public and private sectors because this cadre has understanding and insight of data analysis and information use. Health information systems in many low-and middle-income countries tend to be "data-rich" but "information-poor due inadequate analytic skills.

Accessibility and Use

It was observed that there was low knowledge in the usage of computer software which hampered easy access and use of information. According to [16], poor access and vast amount of health information, not comprehensive and retrievable was due to lack of computer technology and internet connectivity. However, on the contrary [17] argues that the emerging electronic exchange environment may create new challenges for balancing reliable access to clinical data with protection of patient privacy and respect for individual patient preferences regarding data use.

It was observed that clinical data accessible was to the government and the policy makers unlike in case study in Iran which revealed that clinical data collected and analyzed was used in patient care and secondary data were used in health service management such as allocation of resources, evaluation of services, research and health Educcation [18].

The study showed that the Government was leading in accessing, processing and use of health information generated by healthcare workers. The study revealed that the majority of service providers generated information but used very little. The Government generated very little information but used so much. These results were consistent with the study findings in Tanzania and Mozambique facilities [19], where reports were never analyzed and used for local decision-making at facility level.

This was contrary to the expected standards [20], in that health Information was to be used for health care of patients and clients at the source. It was also contrary to the objective of generating health information; to monitor the health status and health services of a nation and to improve public health leadership and management at facility [21].

The results of the DHIS study carried out in Iran [22] conforms with the results of this study and explains the elements that limits utilization of DHIS data and rEducced effectiveness of healthcare services management. According to [23], the greatest challenge for health system managers was lack of commitment and deep belief of implementation and utilization of modern management in health information management area.

Even with better availability of indexes, a wealth of information from countries or regions was not accessible because either it was never published in any form or it was published but generally not indexed. Larsson explains that regulations relating to healthcare data, privacy and confidentiality are also often barriers to use health IT as they tend to restrict the sharing of patient data among providers [24].

It was observed that below half of the reports generated were shared monthly and quarterly. Masys explains that many countries have developed a data warehouse which supports strategic planning, modeling and forecasting at the organizational level. This enables data to be readily accessible, understandable and use to compare and contrast data across multiple sources and systems [25].

Knowledge

The study disclosed that more than sixty percentage of the healthcare workers do not have computer knowledge and most facilities do not use computer software. According to Kathleen, referring to technology or computer skills, as a health information manager without which one will not get far. McConnell contributed that nature of medical knowledge and technology requires everyone in the health care sector to have computer knowledge and skills [26]. The study reveals that health care is an information-intensive but the act is not used in the health care delivery especially in analysis and storage. McGraw-Hill explains that e-health and healthcare information technology (health IT) have become a key preoccupation of healthcare systems worldwide [27]. Implementation of electronic health records (EHRs) and health IT systems is considered among the highest priorities

Staff cadre	Sharing	DQAs	Supervision	OJTs	Val Checks	Do nothing	Total
Nutritionist	3(1.9%)	0(0%)	0(0%)	1(0.6%)	1(0.6%)	0(0%)	5(3.1%)
Pharm Tech	2(1.3%)	1(0.6%)	0(0%)	0(0%)	1(0.6%)	0(0%)	4(2.5%)
Radiographers	0(0%)	1(0.6%)	0(0%)	0(0%)	0(0%)	0(0%)	1(0.6%)
Admins	0(0%)	0(0%)	0(0%)	2(1.3%)	0(0%)	0(0%)	2(1.3%)
Nurse	24(15%)	7(4.4%)	8(5%)	2(1.3%)	14(8.8%)	3(1.9%)	5837.3%)
Clinical off	6(3.8%)	4(2.5%)	2(1.3%)	2(1.3%)	6(3.8%)	1(0.6%)	21(13.1%)
Health Record	4(2.5%)	5(3.1%)	2(1.3%)	0(0%)	1(0.6%)	0(0%)	12(7.5%)
PHO	8(5%)	2(1.3%)	3(1.9%)	1(0.6%)	1(0.6%)	3(1.9%)	18(11.3%)
Counselors	4(2.5%)	1(0.6%)	2(1.3%)	1(0.6%)	5(3.1%)	0(0%)	13(8.1%)
Data clerks	1(0.6%)	0(0%)	0(0%)	0(0%)	2(1.3%)	1(0.6%)	4(2.5%)
Doctors	1(0.6%)	0(0%)	3(1.9%)	0(0%)	1(0.6%)	0(0%)	5(3.1%)
Lab Officers	6(3.8%)	2(1.3%)	1(0.6%)	2(1.3%)	3(1.9%)	3(1.9%)	1710.6%)
Total	59(36.9%)	23(14.4%)	21(13.1%)	11(6.9%)	35(31.9%	11(6.9%)	160(100%)

Table 12: Ensuring data quality among healthcare workers.

	Yes	No
Nutritionist	0(0%)	5(3%)
Pharm Tech	0(0%)	5(3%)
Radiographers	0(0%)	1(1%)
Administrator	0(0%)	2(1%)
Nurse	0(0%)	57(36%)
Clinical Medicine	0(0%)	21(13%)
Health Record	0(0%)	12(8%)
PHO	0(0%)	18(11%)
Counselors	0(0%)	13(8%)
Data clerks	0(0%)	4(3%)
Doctors	0(0%)	5(3%)
Laboratory Officers	0(0%)	17(11%)
Total	0(0%)	160(100)

Table 13: Guidelines and M & E framework to improve data quality.

Specialty	Yes	No	Total
Nutrition	5(3.1%)	3(1.9%)	8(5%)
administration	3(1.9%)	2(1.3%)	5(3.1%)
Radiology	1(0.6%)	1(0.6%)	2(1.3%)
Administrator	1(0.6%)	1(0.6%0	2(1.3%)
Nurse	40(25%)	20(12.5%)	60(37.5%)
Clinical Officer	15(9.4%)	5(3.1%)	20(12.5%)
Health Records	12(7.5%)	1(0.6%)	13(8.1%)
Public Health	10(6.3%)	6(3.8%)	16(10%)
Data management	4(2.5%)	5(3.1%)	9(5.6%)
Laboratory	5(3.1%)	1(0.6%)	6(3.8%)
Counseling	3(1.9%)	4(2.5%)	7(4.4%)
Pharmacy	7(4.4%)	5(3.1%)	12(7.5%)

Table 14: Health workers responsible for quality of data.

of modern healthcare systems. Despite increasing evidence on the value of information technology, adoption of healthcare information technology proceeds at a snail's pace due inadequate knowledge and systems.

The study revealed that data analysis training was undertaken by only health records and information officers. Nurses were the majority in tools training and a big number had not undergone any training at all. The tools training was the highest among the nursing health staff. Middleton concurs with study findings; there was significant information management skills gap amongst information professionals [28]. Staff training or retraining becomes imperative, because without training, the vast amount of electronic health information resources will be underused. There was realization that the provision of electronic information in the health sector does not match that of the academic sector [29]. To meet the increasing demand for information to measure performance against national priorities and policies, there is an urgent need to increase the data analysis skills of information producers. There is need for training on data analysis tailored to the level of knowledge and background of the target health workers. Further, an essential step in strengthening a health information system is to bring data producers (those delivering care) together with together with data users (those involved in decision-making, management, planning and financing [30].

Availability

On the other hand, the study showed that reasons for generation of information by healthcare workers was to forward to the ministry of health headquarters and very small proportion was used at the facility level. The used information, larger proportion was for planning. These results concurred with the study findings in Gaborone, where higher levels utilized information more than the lower levels [31]. According to [32], these findings contradicted the purpose of data collection and information which was to empower individuals and the public to make the right decisions regarding their health and well-being; to influence public health policy and decision making; Health information is valuable if it is used by decision-makers and provides at facility level. The use of information therefore is not only forwarding to other bodies to use but using at source. The results of this study concurred with the findings of the study assessment conducted in Iran [1]; most score of DHIS criteria compliance with WHO, was related to data gathering which was high and the least score was related to utilization of information for decision making at the point of source. The study results showed that almost all primary facilities used paper based health information system, while hospitals used electronic system to make data available. Peersman concurs with this study finding; data collection and reporting uses paper tools; analysis, storage and retrieval were manual [33]. Pierce describes Governments across the world in various stages of planning initiatives designed to leverage advances in health IT for the health of their citizens [34]. The hazards of not having an e-health is too apparent to ignore.

It was observed that data tools were not available and shortages were experienced which hampered data generation. This concurs [35], that data management is inadequate in most countries where there are no clear procEducres for the collection, storage, analysis, and distribution of data, nor a centralized data depository. Managers' Information use in Gaborone and appropriateness of data collection tools were difficult to achieve [36]. Several studies in developing countries have revealed that tools are difficult to grasp and use due to overlapping of data elements, irrelevant to information users and ineffective for decision making [37].

Quality of Information

Most health workers are not trained in information communication technology and therefore are not ICT compliant. Majority have been trained on paper based data tools. It was also observed that none of the facility in the sub county used pure electronic system consequently resulting in data poor quality. According to Shekelle, in the study entitled "Use of information technology in health information management" showed that application of information technology has been developed in various industries but not in the area of Health Information [38]. Internet Navigation to Knowledge [39], found that rapid growth of the Internet has triggered an information revolution of unprecedented magnitude. Despite its obvious benefits. The increase in the availability of information could also result in many potentially harmful effects on both consumers and health professionals who do not use it appropriately. Ministry of Health annual reports are unreliable in content and the evidence base for making quality decisions is contestable, a health information system is listed as one of six national priority areas [40]. Funding for the work is obtained from the World Bank and included procuring an electronic patient administration system. The project is an excellent demonstration of the good outcomes that can be achieved with strong political and management support and early engagement of clinical champions [41].

According to Trivedi, health information technology (health IT) infrastructure improves quality, rEducces medical errors, health disparities, health care costs and advances the delivery of patient-centered medical and facilitates health and clinical research [42].

It was observed that there were no health information standards, framework, policy/guidelines and regulations and information demand and use plan. This results concurred with the result in District information system (DHIS) assessment in Iran [43], where some elements that limited utilization of DHIS and rEducced effectiveness of healthcare services management were: lack of DHIS infrastructures, proper assessment of essential information needs, data gathering system, processing and analyzing methods. There were no appropriate methods of information presentation, interpretation of accumulated information, and information based [44].

A study on HMIS in Tanzania revealed that data quality and accuracy were not sufficiently assured through simple validation or verification procEducres, information was generally not sufficiently used for local decision-making, and data presentation, analysis, and feedback are generally very weak leading to inefficiencies in the system. Maney and Wang describes public health decision-making as critically dependent on the timely availability of sound data. The utility of health information, research evidence and knowledge is to better inform and thus empower individuals and the public to make the right decisions regarding their health and well-being; influence public health policy and decision making; advance the frontiers of knowledge to develop products and tools for the promotion, maintenance, protection and restoration. Health information is valuable if it is useful to decision-makers and provides incentives for, or facilitates, the use of information [45-54].

Conclusions and Recommendations

Most healthcare workers handled data and information were not professionals in health information management and therefore incompetent in data collection and analysis due to lack of knowledge and technology in health informatics. Access and use of information were low due to inadequate ICT infrastructure and computer deployment in most facilities in Gucha Sub County. This led to paper based health information systems and minimal electronic systems consequently data and information availability, quality and use were compromised.

The healthcare workers generated a lot of information which they forwarded to other levels for use especially the government in development of policies, making of decisions and planning, although it was meant for use by healthcare workers to improve efficiency and effectiveness in the health care services at facility level. Inadequate training in the use data tools and lack of the policies, standard guidelines and M and E framework in the use of information played a role in the general use of information in the sub county. There has never been a research establishing or determining the use or non-use of information so thing was assumed to okay.

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