Factors Influencing Utilization of Routine Health Information For Decision Making Among Health Workers: A Case Study of Health Facilities in Moyo District, Uganda

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Abstract

Health information is a powerful vehicle for enhancing community health and it highlights both the problems and opportunities that exist for development. In Uganda, there are cases where decisions have been made without using health information in primary health care units. The existing capacity inadequacy to efficiently utilize information to track service use patterns over time to determine the impacts of policy and service delivery improvements in Uganda is one of the key weaknesses. With the support of the Ministry of Health, the government of Uganda is implementing projects to build and enhance the nation's web-based national health information system (DHIS2), which collects data from all health systems and allows for making decisions based on evidence on the delivery of health services. The broad study objective was to establish the factors influencing the utilization of routine health information for decisions making among the health workers. The research design was based on an analytical cross-sectional design. The target population for this study was 260 health workers specifically targeting those involved in the use of routine utilization of health information. Purposive sampling was used to select the key informants and other respondents were selected using simple and stratified random sampling. The self-administered structured questionnaire and key informants' interviews were used to collect data from respondents. The analysis of the quantitative data was done using descriptive statistics consisting of tables, bar graphs, pie charts, frequency, percentages, mean and standard deviations. Logistic regression analysis was conducted for establishing the association amongst the variables. The study established that technical factors ($\chi 2$=801.069; p=0.001), organizational factors ($\chi 2$=895.224; p=0.000), and behavioural factors ($\chi 2$=994.559; p=0.000) had a significant influence on utilization of routine health information for decision making. Talk of significant predictors of utilization of routine health information for decision making, technical factors (p = 0.013) had the greatest influence on utilization of routine health information for decision making among health workers at health facilities followed by organizational factors (p = 0.049). The study recommends that management of health facilities in Moyo district to create organizational culture through increased demand for and use of routine health information for evidence-based decision making in all aspects. The study further established areas of the routine health information system that requires to be reinforced and backed up to ensure the use of routine data in health facility to make decisions.

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Abstract

Health information is a powerful vehicle for enhancing community health and it highlights both the problems and opportunities that exist for development. In Uganda, there are cases where decisions have been made without using health information in primary health care units. The existing capacity inadequacy to efficiently utilize information to track service use patterns over time to determine the impacts of policy and service delivery improvements in Uganda is one of the key weaknesses. With the support of the Ministry of Health, the government of Uganda is implementing projects to build and enhance the nation's web-based national health information system (DHIS2), which collects data from all health systems and allows for making decisions based on evidence on the delivery of health services. The broad study objective was to establish the factors influencing the utilization of routine health information for decisions making among the health workers. The research design was based on an analytical cross-sectional design. The target population for this study was 260 health workers specifically targeting those involved in the use of routine utilization of health information. Purposive sampling was used to select the key informants and other respondents were selected using simple and stratified random sampling. The self-administered structured questionnaire and key informants' interviews were used to collect data from respondents. The analysis of the quantitative data was done using descriptive statistics consisting of tables, bar graphs, pie charts, frequency, percentages, mean and standard deviations. Logistic regression analysis was conducted for establishing the association amongst the variables. The study established that technical factors ($\chi 2$=801.069; p=0.001), organizational factors ($\chi 2$=895.224; p=0.000), and behavioural factors ($\chi 2$=994.559; p=0.000) had a significant influence on utilization of routine health information for decision making. Talk of significant predictors of utilization of routine health information for decision making, technical factors (p = 0.013) had the greatest influence on utilization of routine health information for decision making among health workers at health facilities followed by organizational factors (p = 0.049). The study recommends that management of health facilities in Moyo district to create organizational culture through increased demand for and use of routine health information for evidence-based decision making in all aspects. The study further established areas of the routine health information system that requires to be reinforced and backed up to ensure the use of routine data in health facility to make decisions.

Key words : Technical Factors; Organizational Factors, Behavioural Factors and Utilization of routine health information.

Highlights

- Technical factors positively and significantly influenced utilization of routine health information for decision making among health workers at health facilities in Moyo District, Uganda.

- Organizational factors positively but insignificantly influenced utilization of routine health information for decision making.
- Behavioral factors positively and significantly influenced utilization of routine health information for decision making.
- Management of health facilities need to create organizational culture through increased demand for and use of routine health information for evidence-based decision making.

1.1 Introduction

The health information system (HIS) refers to a data management system. It consists of systems that collect, store, administers, and communicate the electronic medical record (EMR), operational hospital management, or health policy decision-making system. Health information is the foundation of the overall health systems' building blocks consolidation and "information availability enables health workers to use the same for better policy formulation, planning, execution" (Karuri, Waiganjo, Orwa & Manya, 2014). Health staff collects data on patients and health facility workers report regularly on every activity in the health facility (WHO, 2016). The use of health information is an integral part of health departments' institutional capability, and the efficacy of the use of information can affect the performance of public health. The ultimate objective of decision-making based on evidence is to enhance the healthcare quality by "increasing the capacity of the health system to meet the needs of the" people they represent (WHO, 2015).

Routine health information systems are not providing the essential data support for making decisions in developing countries for several reasons. Among the reasons for these reports "are poor quality of data; weak analysis of data; inadequate information culture"; inadequately qualified staff and HIS activities as a consequence of a lot of workloads, particularly in the health sector (Aarthun & Akerjordet, 2014). Globally, routine health information management is among the six pillars that are very important for health systems escalation. It's a mechanism in which health data for the creation, management, implementation, and evaluation of health programs are collected, stored, and processed. "Health management information has been described in the major cases as the cornerstone for improved health and as a crucial constituent of making" good decisions. To health administrators at all levels, accurate and timely knowledge about service delivery and other key indicators is of great value (Fanzo, 2014).

In Africa, many Sub-Saharan nations, in particular Zambia has reformed their system for health services to support decentralized management of services. To respond directly to local management demands and document the progress and consequences of reform, the information system has been one of the first objectives of reform. Information is power, and in public health, this concept is particularly true. When people in public health can easily access accurate information, they can respond quickly. The utilization of health information leads to the saving of more lives (Asemahagn, 2017).

In research conducted in South Africa, a detailed review of the information system revealed that the volume of collected data is tremendous, but that the quantity of meaningful information derived from it is small (Braa *et al* ., 2012). It is pointless to collect health information if it is not used to influence decision-making, and it is pointless to improve data quality if efforts to do so do not involve actions to increase local demand for information and to make information more accessible. The knowledge generated "from health-related information systems (HIS) helps with the implementation of health policies, the" prioritization of health programs and the assessment of them (Karuri, Waiganjo & Orwa, 2014).

In 1985, Uganda's design of health information system (HIS) was for data capturing as well as interpreting morbidity statistics for designated infectious, non-infectious as well as other health services (MoH, 1985). The goal of the HMIS in Uganda is to offer a comprehensive system of meaningful and operational information regularly to all stakeholders (MOH, 1996). Specifically, it is intended for use at the medical center, district, and national levels for planning, managing, and assessing the healthcare delivery system. These key tasks are crucial to enhancing health care quality in Uganda. Developed by Uganda's "Ministry of Health, Health Management Information Systems (HMIS) aim to improve routine information by placing data straight to

the hands of" those making decisions at every level of the health system for strategic planning, establishing priorities, evaluation, and monitoring of programs, policy development and enhancing the quality of care provided to patients (Asiimwe, 2016).

Currently, the Ugandan Government through the Health Ministry as well as other stakeholders are implementing initiatives for developing and improving "a web-based national health information system (DHIS2) which collects data from every health system hence minimizing the necessity for various parallel systems which are collecting data at community, facility, county, and national levels" to help health officials in making decisions based on evidence at every level of delivering health services (MOH, 2017).

In Uganda, the health information data collection is done by the Ministry of Health (MOH) which manages the health system in Uganda. The district health managers are tasked with planning for health service delivery and have been utilizing the collected health information to make health decisions. For instance, health information has been used to add value and achieve better outcomes for healthcare settings, such as new treatments and technologies in Uganda (Henriksson, Peterson, Waiswa, & Fredriksson, 2019).

Moyo District in Northern Uganda is among the oldest districts in Uganda established in 1956 before Uganda was declared independent. It accommodates a large population of nationals and refugees from South Sudan, ensuring that various health services are served to meet their needs at health facilities. It is therefore significant to understand whether these health facilities consider the continuously recorded data in making decisions on quality service delivery and contribute to national policy briefs (Asiimwe, 2016).

1.2 Statement of the Problem

Health information is a powerful vehicle for enhancing community health and it highlights both the problems and opportunities that exist for development. Significant human and financial capital in the aggregation of people, services, and communities have been invested worldwide (Asemahagn, 2017). Among the most persistent characteristics of the age of information is that we have placed too much emphasis on the mastering transaction information and far too little emphasis on transforming it into information and knowledge which can be used to generate business outcomes and profits (Karuri et al., 2014; Davenport, et al., 2010). Among the most significant impediments to the successful planning of health services in Uganda is the scarcity of trustworthy health information.

There are cases in Uganda where decisions have been made without using health information in health care units. The existing inadequate capability to efficiently utilize information to track service use patterns over time to determine the effects of policy and service delivery improvements in Africa is one of the key weaknesses (Asiimwe, 2015; Makinde, *et al.,* 2016). Routine health information utilization in making decisions in health facilities remains low at 59% in Uganda (Dagnew, 2018) particularly in health facilities in Moyo District in Uganda. Dagnew (2018) further noted that 65.8 percent of health staff exhibited inadequate utilization level of routine health information. According to a report given to the Ministry of Health, Moyo received a score of only 40 percent when it came to screening TB patients for HIV. The under-reporting of health data that has persisted over the years has had an impact on Moyo's position in the national district league table, which has dropped from second place in 2002 to forty-first place in 2020 (AHSPR, 2020).

Examination of the records for Moyo District's District Health Officer (DHO), reveals that most HMIS reports from the health facilities are incomplete, unreliable, and hasty. The district's regular stocking of essential medicines is focused on the HMIS statistics provided and as a result, patients are prescribed expensive drugs, which they are compelled to purchase outside of the healthcare institution because of stockout of essential medicines at the health facilities (Asiimwe, 2016).

Various studies have been done about effective "routine health information use for decisions making at" health facilities and some of these include Mboro (2017), Cherongo (2016), and Karijo (2013). Most of the studies did not focus on factors influencing "utilization of routine health information for making decisions among health staff at the health facilities. Hence, this study seeks to bridge this research gap by establishing

factors influencing utilization of routine health information for making decisions among health staff at health facilities" in Moyo District, Uganda.

1.3 Objectives of the Study

The "broad objective of the study was to establish the factors influencing utilization of routine health information for decision making among health workers" at health facilities in Moyo District, Uganda. The study was guided by the following objectives:

1. To "establish the influence of technical factors among health workers on utilization of routine health information for decision making at health facilities" in Moyo District, Uganda.
2. To assess the influence of organizational factors among health workers "on utilization of routine health information for decision making at health facilities" in Moyo District, Uganda
3. To examine the influence of behavioral factors among health workers "on utilization of routine health information for decision making at health facilities" in Moyo District, Uganda.

1.4 Theoretical Framework

This is the framework that a research theory may contain or endorse. The theory structure illustrates and describes the theory which describes the reason behind the existence of the research problem and the importance of this analysis of each theory. This study was hinged on Evidence-Based Health Information systems. The theory was chosen since the arrangement of everyday routines knowledge needs to be evidence-based so that every planning agency can formulate plans and policies (Carbone, 2008). Researchers proposed that it was important to suit the technological subsystems and social subsystems that constituted an organization together. As per WHO (2016), proper information collection, management, and use in healthcare systems would decide the effectiveness of the program in the detection of health problems, prioritization, recognition, and allocation of resources to increase the health outcome. In addition, the theory suggested that healthcare environments belong and are accomplished by health staff who are also key makers of decisions (Carbone 2008), and clinicians need an incentive to affect the change in behavioral in medical practice by making use of local (electronic) health records in making decisions. This theory is pertinent to the study as it explains how health staff behavioral factors such as attitude, motivation, roles, and responsibilities may influence use of routine health information for making decisions at hospitals in Moyo District, Uganda. However, the theory does not cover the other factors such as technical factors and organizational factors and hence the need for a second theory.

1.5 Conceptual Framework

"The conceptual framework is intended to assess the extent to which the dependent variable depends on the independent variables. The conceptual framework" often shows how research is guided, endorsed, and validated by the structure of concepts, expectations, beliefs, and theories and is "a key part of research design. The conceptual framework" diagrammatically describes the relationship between these variables as shown in Figure 1.

Figure 1: Conceptual Framework

Source: Modified from Chorongo (2016)

1.6 Research Methodology

The research design was based on the analytical cross-sectional study design. A cross-sectional research design was adopted by the researcher since it is expected to provide a summary of what's happening with the variables that are of importance for the study challenge. This study adopted "a mixed-methods approach

(quantitative, qualitative data collection methods, observation, and" desk review). The study was conducted in Moyo District Uganda. Moyo District is a district in the northern Ugandan region of the country. The sample population for this study was 260 health workers (District Health Officers, Medical Officers, HMIS Officers, Department Heads in Hospitals, Sub County Health Officers, Health facility managers, Pharmacists, Clinicians, Laboratory Technicians, Nutritionists, Midwives, and Nurses) working in Moyo district specifically targeting those involved in the health information utilization. The sample size was 260.

This study used both quantitative and qualitative research tools like questionnaires and interview guides, observations checklist, and desk reviews to collect both quantitative and qualitative data. The researcher used a self-administered semi-structured questionnaire. Questionnaires had questions covering socio-demographic characteristics and factors influencing routine health information utilization for making decisions. The researcher also used a key informant's interview guide for collecting qualitative data. These had questions covering all concepts as per the study objectives including "technical factors, organizational factors, and behavioral factors influencing utilization of routine health information for" making decisions among health staff. Observation and document review was utilized to determine how well collection of data, processing, and health information utilization are being done at the health facilities under investigation.

The self-administered structured questionnaire was used for the district health officers, HMIS officers, hospital department heads, sub-county health officers, health facility managers, and other health cadres at health facilities. The researchers performed 11 face-to-face key informants' interviews with health workers, including the district health officers, HMIS officers, hospital department heads, sub-county health officers, and health facility managers at health facilities. Following the scheduling of visits with the various key informants, open talks took place in which the researcher acted as moderator. Audio recorders were used to record the interviews which was later listened to, and content typed later. Observation and review of the documents was utilized to establish a collection of the data, "reporting and health information utilization at the health facilities. There was the use of observation checklist to establish the infrastructure in place, storage methods and determine how data" is used.

The researcher used "both quantitative and qualitative data analysis techniques to analyze the data that was collected from" the different health cadres in the study population. The "data from the questionnaires were sorted, coded, and edited for consistency and ease of use before being loaded into the Statistical Package for Social Sciences (SPSS Version 25). Data entry, coding, and data cleaning was done in SPSS. Descriptive statistics such as frequencies, mean and standard deviations were computed for all the study variables. The entered data was then analyzed and the association amongst the factors" which influence routine health information utilization utilizing chi-square and logistic regression. Additionally, logistic regression analysis utilizing SPSS was as well adopted in analyzing "how (the degree to which) these factors (independent variables) under examination influenced utilization of routine health information. Data from questionnaires were presented subsequently in the form of frequency tables, pie charts, and graphs to make it simpler to understand. The study used content analysis for analyzing the quantitative data obtained from interviews and open-ended questions. Using content analysis, the researcher can quantify and analyze the presence, meanings, and relationships of such certain words, themes, or concepts. Some concepts and relevant responses from the interviews were presented to corroborate the quantitative results in the form of direct quotations from the participants.

1.7 Ethical Approval

We obtained ethics approval from Mount Kenya Institutional Ethical Review Committee. The research obtained a research permit from The AIDS Support Organisation (TASO) Research and Ethics Committee, Uganda National Council for Science and Technology (UNCST) and sought permission to do the study from the District Health Officer Moyo.

1.8 Research Findings and Discussions

1.8.1 Descriptive Statistics

Technical Factors Influencing Utilization of Routine Health Information for Decision Making

The study further sought to establish the influence of technical factors among health workers on utilization of routine health information for decision making at health facilities in Moyo District, Uganda. The respondents were asked to indicate the extent to which the respondents have received training in various areas using the 1-5 Likert scale where 1 is never, 2 is rarely, 3 is sometimes, 4 is often and 5 is always. The findings are shown in Table 1.

Table 1: Training and Use the Routine Health Information for Decision-Making

Aspects of training	**Use the Routine Data for Decision-Making Never**	**Use the Routine Data for Decision-Making Rarely**	**Use the Routine Data for Decision-Making Sometimes**	**Use the Routine Data for Decision-Making Often**	**Use the Routine Data for Decision-Making Always**	χ^2	**df**	**Sig.**
HMIS (Data collection and reporting)	1.4% (3)	16.2% (34)	32.9% (69)	12.9% (27)	36.7% (77)	40.21	16	.00
Data analysis	1.4% (3)	14.8% (31)	32.9% (69)	12.4% (26)	38.6% (81)	30.53	16	.02
Data presentation	1.4% (3)	16.2% (34)	32.9% (69)	12.9% (27)	36.7% (77)	30.74	16	.02
Computer software's	1.4% (3)	11% (23)	30.5% (64)	10% (21)	47.1% (99)	46.45	16	.00

From Table 1, the findings showed that training in HMIS (Data collection and reporting) ($\chi^2 = 40.21$, p=0.00), training in data analysis ($\chi^2 = 30.53$, p=0.02), training in data presentation ($\chi^2 = 30.74$, p=0.02) and training in computer software's ($\chi^2 = 46.45$, p=0.00) have always and significantly led to use of routine health information by health workers for decision-making at health facilities in Moyo District, Uganda. This implies that receiving training HMIS (data collection and reporting), data analysis and data presentation equips health workers with adequate skills and expertise on how to utilize routine health information while making decisions. The findings also agree with Aila (2021) who argued that training that improves health workers skills in data gathering, analysis, interpretation, and information management increases their likelihoods of utilizing routine health data in making decisions.

Further, the respondents were asked to rate their ability to conduct the various activities in relation to data/information management in using routine data in decision making using 1 is very poor, 2 is poor, 3 is acceptable, 4 is good and 5 is very good. The findings are shown in Table 2.

Table 2: Ability to Conduct the Activities and Use of Routine Data in Decision Making

Abilities	**Use the Routine Data for Decision-Making Very poor**	**Use the Routine Data for Decision-Making Poor**	**Use the Routine Data for Decision-Making Acceptable**	**Use the Routine Data for Decision-Making Good**	**Use the Routine Data for Decision-Making Very good**	χ^2	**df**	**Sig.**
I can accurately check data	1.4% (3)	16.2% (34)	32.4% (68)	11% (23)	39% (82)	38.49	16	.001
I can calculate percentage/rates	1.4% (3)	16.2% (34)	32.9% (69)	12.9% (27)	36.7% (77)	42.67	16	.000
I can plot information by month or year	1.4% (3)	14.8% (31)	32.4% (68)	11.4% (24)	40% (84)	56.22	16	.000
I can explain findings and their implications	1.4% (3)	16.2% (34)	32.9% (69)	12.9% (27)	36.7% (77)	39.73	16	.001
I can use information to identify gaps and set targets	1.4% (3)	16.2% (34)	29% (61)	9.1% (19)	44.3% (93)	34.63	16	.004

As per the Table 2, the findings showed that the ability for health workers to accurately check data (χ^2 = 38.49, p=0.001), to calculate percentage/rates (χ^2= 42.67, p=0.00) and to plot information by month or year (χ^2 = 56.22, p=0.00) have always and significantly enabled them to use of routine data in decision making at health facilities in Moyo District, Uganda. The findings further revealed that the ability for health workers to explain findings and their implications (χ^2 = 39.73, p=0.001) and to use information to identify gaps and set targets (χ^2 = 34.63, p=0.00) have always and significantly enabled them to use of routine data in decision making at health facilities in Moyo District, Uganda. The findings imply that the ability of health workers to accurately check data, calculate percentage/rates, explain findings and their implications, and also use information to identify gaps and set targets puts them in a better position to use routine health information in making decisions in the health facility. These findings concur with Otieno (2020) noted that having skills in data gathering, analysis, interpretation, and information management means that the managers would understand and effectively and efficiently utilize health information in their managerial duties. Ministry of health needs to put a lot of emphasis on "HMIS as a subject in the pre-service training institutions of all healthcare cadres.

Organizational Factors Influencing Utilization of Routine Health Information for Decision Making

Further, the study sought to assess the influence of organizational factors among health workers "on utilization of routine health information for decision making at health facilities" in Moyo District, Uganda. The respondents were asked to indicate their agreement with various statements on basis of making decisions in the facility using 1-5 Likert scale where 1 is strongly disagree, 2 is disagree, 3 is neither disagree or agree, 4 is agree and 5 is strongly agree. This implies that in interpretations: a Mean Score that is less than 1.5 indicates Never; a Mean Score that is equal and greater than 1.5 but less than 2.5 indicates Rarely; Mean Score that is equal and greater than 2.5 but less than 3.5 indicates Sometimes; a mean score that is equal and greater than 3.5 but less than 4.5 indicates often; while a Mean Score that is equal and greater than 4.5 indicates always. The findings are shown in Table 3.

Table 3: Agreement with Statements on Basis of Making Decisions in the Facility

At this facility decisions are based on:	**N**	**Mean**	**Std. Dev.**
Personal liking	210	3.671	1.116
Superiors' directives	210	3.776	1.013
Information/ facts	210	3.829	1.026
Health needs	210	3.843	0.968
Job experience	210	3.657	1.015
Considering costs	210	3.667	0.935
Comparing data with strategic health objectives	210	3.700	0.969
Intuition/arbitrary	210	3.410	1.167

From the findings in Table 3, majority of the respondents agreed that at their facility, the decisions are based on health needs as shown by a mean of 3.843, on information/ facts as shown by a mean of 3.829 and on superiors' directives as shown by a mean of 3.776. The respondents also agreed that at their facility, the decisions are based on comparing data with strategic health objectives as shown by a mean of 3.700, on personal liking as shown by a mean of 3.671, on considering costs as shown by a mean of 3.667 and on job experience as shown by a mean of 3.657. However, the respondents neither disagreed nor agreed that at their facility, the decisions are based on intuition/arbitrary as shown by a mean of 3.410. This is an indication that health workers have been using routine health in making decision since most facility decisions are based on information/ facts, health needs and comparing data with strategic health objectives. The findings are contrary to findings by Tilahun, et al. (2021) who argued that routine data for decision-making at the local level was found to be low and hence strengthening the capacity of health workers and introducing accountability mechanisms for health data are essential to improve data use and quality.

Further, the respondents were asked to indicate whether they have access to functional equipment in their office/workplace which enable them to use routine health information in decision making using 1 to 5 Likert scale where 1 is rarely, 2 is sometimes, 3 is often, 4 is frequently and 5 is always. The findings are illustrated in Table 4.

Table 4: Access to Functional Equipments in the Workplace and use of Routine Data in Decision Making

Access to	**Use the Routine Data for Decision-Making Never**	**Use the Routine Data for Decision-Making Rarely**	**Use the Routine Data for Decision-Making Sometimes**	**Use the Routine Data for Decision-Making Often**	**Use the Routine Data for Decision-Making Always**	**χ^2**	**df**	**Sig.**

Computer	1.4% (3)	13.8% (29)	32.9% (69)	12.9% (6)	49.1% (103)	30.47	16	.02
Printer	1.4% (3)	12.4% (26)	32.9% (69)	12.9% (27)	40.5% (85)	30.18	16	.02
Calculator	1% (2)	15.7% (33)	24.3% (51)	12.9% (27)	46.2% (97)	34.85	16	.00
Data backup units	.5% (1)	6.7% (14)	11% (24)	16.7% (35)	64.8% (136)	38.73	16	.00
Access to internet	1.4% (3)	16.2% (34)	32.9% (69)	12.9% (27)	36.7% (77)	20.50	16	.19

From Table 4, the findings showed that access to computer (49.1%,$\chi^2 = 30.47$, p=0.02), to printer (40.5%,$\chi^2 = 30.18$, p=0.02), to calculator (46.2%,$\chi^2 = 34.85$, p=0.00) and to data backup units (64.8%, $\chi^2 = 38.73$, p=0.00) always and significantly enable the health workers to use routine health information in decision making at health facilities in Moyo District, Uganda. However, access to internet (36.7%,$\chi^2 = 20.50$, p=0.19) rarely and insignificantly enable the health workers to use routine health information in decision making at health facilities in Moyo District, Uganda. This implies that health workers in Moyo district have access to calculator, computer, printer, and data backup units which makes it possible for health workers to use routine health information in making decisions. This concurs with Chorongo (2016) who noted that access to equipments such as calculators, computers, and data backup units have helped health program managers in Kilifi County in making decisions based on health management information. The findings corelate with Otieno, Muiruri, and Kawila (2020) argued that organizational characteristic was significantly predictive "of health information utilization in decision-making among healthcare managers in Mombasa County. These findings revealed that improving feedback systems, managerial support and available resources on health information systems can increase the use of health information in making decisions when it comes to health care.

Behavioral Factors Influencing Utilization of Routine Health Information for Decision Making

The study further sought to examine the influence of behavioral factors among health workers "on utilization of routine health information for decision making at health facilities" in Moyo District, Uganda. The respondents were asked to indicate their level of agreement with various statements regarding the influence of behavioral factors of health workers on routine health information utilization at making decisions in health facilities in Moyo District, Uganda using the 1-5 Likert scale where 1 is Strongly Disagree (SD), 2 is Disagree (D), 3 is Neither Agree or Disagree (N), 4 is Agree (A) and 5 Strongly agree (SA). The findings are shown in Table 5.

Table 5: Agreement with Statements on Influence of Behavioral Factors of Health Workers

	Mean	**Std. Dev.**
Routine health information system users demand for information	3.838	0.975
Users have confidence to use health information generated from the health facilities	3.729	0.937
Staff have competence to perform health management information systems tasks	3.638	1.055
Staff have poor attitude towards data collection	3.224	1.324
Staff belief that routine health management information system is useless	2.943	1.347
Staff belief that the routine health management information data collected is accurate	3.662	0.986
Lack of motivating incentives to staff from data management team	3.886	0.895
Collecting information that adds no value irritates me	3.752	0.894
There is a commitment among the staff on to improving the health of the community in question.	3.738	1.117
There is a need to collect information to monitor the performance of the facility.	3.724	1.040
Information collected not used for decision making is discouraging	3.714	1.060
There are inadequate motivating incentives for staff during data management team	3.643	0.979

	Mean	Std. Dev.
Staff are encouraged to plan and track output to collect data	3.810	0.934
The co-workers and managers acknowledge my effort in collection of information.	3.771	0.856
Staff understand their roles and responsibilities in handling health information	3.800	0.927
Composite Mean Score	**3.658**	

From the findings in Table 5, the findings showed that there was agreement that behavioral factors of health workers influence utilization of routine health information for decision making at health facilities" in Moyo District as shown by a composite mean of 3.658. This could be attributed to the fact the there is a lack of motivating incentives to staff from data management team (mean=3.886), routine health information system users demand for information (mean=3.838), that staff are encouraged to plan and track output to collect data (=3.810) and that staff understand their roles and responsibilities in handling health information (Mean=3.800). It could also be attributed to the fact that the co-workers and managers acknowledge my effort in collection of information (Mean=3.771), that collecting information that adds no value irritates them mean=3.752) and that there is a commitment among the staff on to improving the health of the community in question (Mean=3.738). The findings corelate with Muhoza, et al. (2022) who while studying behavioral determinants of routine health information system data use in Senegal, established that perceptions of lack of control over the data production, data sharing, and data dissemination processes affected their ability and comfort to use RHIS data consistently. The findings corelate with Farrelly, Lester and Thornicroft (2016) noted that routine information users are more likely to demand encouragement, trust, and ability to perform their tasks which directly influence the performance of the system and processes and also an individual's perception of the usefulness or results of the task. Chorongo (2016) also noted that there was increased utilization of information with positive attitudes, views, and opinions. Management guidance and leadership were also found to influence staff competence/skills and positive attitude towards information use. The findings agree with Aqil, Lippeveld and Hozumi (2009) who argued that routine health information system processes and performance including data collection, transmission, processing, analysis, presentation, data quality check and feedback are directly influenced by RHIS users' confidence, demand, competence, and motivation to carryout RHIS activities.

1.8.2 Inferential Statistics

The Chi-Square and logistic regression were conducted to establish the factors (technical factors, organizational factors, and behavioral factors) influencing the utilization of routine health information for decision making among health workers at the health facilities.

Chi-Square Tests

The chi-square test is a statistical test used to compare observed results with expected results. The study used chi-square to establish factors associated with utilization of routine health information for decision making. The findings are illustrated in Table 6.

Table 6: Chi-Square Tests

Technical Factors	**Value**	**df**	**P**
Pearson Chi-Square	801.069[a]	675	.001
N of Valid Cases	210		
a. 728 cells (100.0%) have expected count less than 5. The minimum expected count is .00.	a. 728 cells (100.0%) have expected count less than 5. The minimum expected count is .00.	a. 728 cells (100.0%) have expected count less than 5. The minimum expected count is .00.	a. 728 cells (100.0%) have expected count less than 5. The minimum expected count is .00.

Organizational Factors	**Value**	**df**	**P**
Pearson Chi-Square	895.224[a]	575	.000
N of Valid Cases	210		
a. 624 cells (100.0%) have expected count less than 5. The minimum expected count is .00.	a. 624 cells (100.0%) have expected count less than 5. The minimum expected count is .00.	a. 624 cells (100.0%) have expected count less than 5. The minimum expected count is .00.	a. 624 cells (100.0%) have expected count less than 5. The minimum expected count is .00.
Behavioral Factors	**Value**	**df**	**P**
Pearson Chi-Square	994.559[a]	825	.000
N of Valid Cases	210		
a. 884 cells (100.0%) have expected count less than 5. The minimum expected count is .00.	a. 884 cells (100.0%) have expected count less than 5. The minimum expected count is .00.	a. 884 cells (100.0%) have expected count less than 5. The minimum expected count is .00.	a. 884 cells (100.0%) have expected count less than 5. The minimum expected count is .00.

From the findings, the study established that technical factors have a significant influence on utilization of routine health information for decision making (χ^2=801.069; p=0.001). The study also found that organizational factors have a significant influence on utilization of routine health information for decision making (χ^2=895.224; p=0.000). Further, the study revealed that behavioral factors have a significant influence on utilization of routine health information for decision making (χ^2=994.559; p=0.000). This implies that technical factors, organizational factors and behavioral factors significantly influences the utilization of routine health information for decision making in Moyo District, Uganda. This concurs with Kirimi (2017) established that technical factors, organizational factors and behavioral factors had a significant effect on performance of routine health information system in Garissa Subcounty, Kenya.

Logistic Regression Analysis

Logistic regression model predicts a dependent data variable by analyzing the relationship between one or more existing independent variables. The findings are illustrated in Table 7.

Table 7: Omnibus Tests of Model Coefficients

		Chi-square	**df**	**Sig.**
Step 1	Step	27.745	3	.000
	Block	27.745	3	.000
	Model	27.745	3	.000

Omnibus tests of model coefficients were used to check that the new model (with various factors included) is an improvement over the baseline model. Chi-square is highly significant (chi-square=27.745, df=3, p=0.000<0.05) and hence the new model is significantly better.

From the findings, Nagelkerke R Square was 0.253 and this implies that 25.3% of the variations in utilization of routine health information for decision making in Moyo District, Uganda could be explained by technical factors, organizational factors, and behavioral factors. This is an indication that technical factors, organizational factors and behavioral factors influenced the utilization of routine health information for decision making in Moyo District, Uganda.

From the findings, the study found that technical factors (B=1.104; p-value=0.013) and behavioral factors (B=1.211; p-value=0.049) were significant predictors of utilization of routine health information for decision

making in Moyo District, Uganda. The study also revealed that a unit change in organizational factors would lead to an insignificant change in utilization of routine health information for decision making in Moyo District, Uganda (B=0.702; p-value=0.224). This finding agrees with Ally (2019) who noted that behavioral, technical and organization determinants motivated health workers to analyse and use health management information to making evidence-based decisions, including staff competence, availability of data tools, adequate training on data use, culture of using data as well as strong guidelines with strong leadership and management throughout data activities. Moreover, the findings disagree with Dagnew (2018) who found that organizational characteristics of public health institutions have a significant effect on Routine health information utilization among health care professionals working at public health institution in North Gondar, Northwest Ethiopia.

1.9 Conclusions

The study concluded technical factors positively and significantly influenced utilization of routine health information for decision making among health workers at health facilities in Moyo District, Uganda (B=1.104; p-value=0.013). The study revealed that health workers need to have technical capacity to use routine health information in making decisions at health facilities. This can be achieved by training on matters regarding HMIS (data collection and reporting), data analysis, data presentation and computer software's. With this training, the health workers will have the ability to plot information by month or year, to accurately check data, to identify data gaps and explain data findings and their implications. Further, the study concluded that organizational factors positively but insignificantly influenced utilization of routine health information for decision making among health workers at health facilities in Moyo District, Uganda (B=0.702; p-value=0.224). This could be attributed to the fact that the decisions in most health facilities are based on health needs, information/ facts, comparing data with strategic health objectives and costs consideration. The utilization of routine health information for decision making is also determined by access to equipments like calculators, printers, computers, and data backup units. The level of support from management on matters pertaining to data/information management also influences utilization of routine health information for decision making.

Moreover, the study concluded that behavioral factors positively and significantly influenced utilization of routine health information for decision making among health workers at health facilities in Moyo District, Uganda (B=1.211; p-value=0.049). For successful utilization of routine health information for decision making among health workers, there is need to motivate data management team, encourage staff to plan and track output to collect data and make sure staff understand their roles and responsibilities in handling health information. It is also important to ensure that there is a commitment among the staff use of health information in making decisions and that staff have competence to perform health management information systems.

1.10 Recommendations

The study recommends that management of health facilities in Moyo district to create organizational culture through increased demand for and use of routine health information for evidence-based decision making in all aspects. There is need for management of health facilities in Moyo district to strengthen organizational resources that supports information use at all levels through provision of tools, computer, skilled personnel, and automation.

Health facilities also need to ensure regular refresher training to ensure that health workers are updated on the use of the HIS as well as on new systems. This would increase health workers' skills and knowledge in understanding data use for decision making.

There is need for the management structures of health facilities in Moyo District to lay emphasis on information values and create leadership on information use in order to boost positive attitude to use information for decision making despite the roles and responsibilities.

The study also recommends that Ministry of Health, district health management team and district development partners in Uganda should put in place more strategies to reinforce and ensure that decision makers request more HMIS data to be utilized for planning, setting priorities, management, and forecasting.

The government of Uganda should play a key role in the management support through support supervision, feedbacks on reports and information sharing and review forums in order to boost information sharing at the health facility level.

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