

Examining Factors Influencing the Use of Health Management Information Systems Data for Health Facility Planning in Kigoma Ujiji and Kigoma District Council, Tanzania

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Abstract

Introduction

Tanzania has adopted an open-source Health Management Information System (HMIS) to help understand health patterns, make informed decisions, and take action to improve the quality of health services through effective planning. However, generating and utilizing health data in most facilities presents significant challenges. This study examined factors influencing the use of HMIS data for health facility planning in Kigoma Ujiji Municipal and Kigoma District Councils.

Methods

This cross-sectional explanatory study was conducted using a qualitative approach in two districts of the Kigoma region—Kigoma and Ujiji district councils. Participants included members of the Council Health Management Teams and staff from six healthcare facilities. The study employed the PRISM framework to explore how technical, organizational, and behavioral factors influence the use of data in health facility planning. Data was collected through in-depth interviews and focus group discussions. Thematic analysis, supported by NVivo software, was applied to manage and analyze the data.

Results

A total of 32 participants were involved in this study. Most reported that health facilities had standard indicators, data collection forms, and established data analysis and reporting procedures, with clear HMIS roles and responsibilities. However, challenges such as poor data quality, insufficient IT resources, inadequate staff training, limited financial support, and unsupportive organizational culture were reported to affect the effective use of data in planning.

Conclusion

Poor data quality, inadequate training, inadequate HMIS staff, and poor information culture, motivation, attitudes, and values limited data use. This study calls for health system interventions to address staffing, training, information culture, data quality, and individual attitudes and behaviors to improve the use of data in health facility planning and decision-making.

Keywords: *HMIS Data Use, Health Facility Planning, Decision Making, Tanzania*

INTRODUCTION

The use of data to support health facility planning is imperative, hence, health management information system (HMIS) as a vehicle for advanced and better-quality healthcare is increasingly emphasized, improved, and implemented worldwide (World Health Organization, 2021). HMIS/district health information system 2 (DHIS2) is recognized as a vital tool for providing data for informed decision-making and planning in healthcare facilities. Moreover, data generation, compilation, analysis, synthesis, communication, and use are entirely dependent on the knowledge, skills, and attitudes of health workers working in different levels of health facilities such as dispensaries, health centers, and hospitals (Mboera et al., 2021; Milella et al., 2021).

Subsequently, the overall quality, relevance, and timeliness of data for health-related decision-making relies on the wider context within which data is collected (Rumisha et al., 2020). Generally, the effective use of data enhances improved health service delivery because any viable and effective health planning is supposed to be made based on credible and reliable health information. A well-established health information system is an upfront requirement for efficient health facility planning and delivering quality health service to the public (Mutemwa, 2006).

Health information systems provide the basis for the overall policy and regulation of all the other health system building blocks, but it is worth noting that health information systems in most developing countries, including Tanzania are generally weak and characterized mainly by record duplications, fragmentation, incompleteness, and multiple storage formats that limit their effective use in healthcare planning (Global Report on Health Data Systems and Capacity, 2020; Mboera et al., 2021; Rumisha et al., 2020). Moreover, several reasons have been associated with the unsatisfactory quality and performance of HMIS. Some of these reasons are technical, where standard indicators, data collection forms, information technology, data analysis and presentation, and trained people are inadequate; organizational, where financial and human resources, structure of the health system, roles and responsibilities, and organizational culture do not support effective performance of HMIS; and behavioral, where staff are not motivated, have poor attitudes, values, confidence, and sense of responsibility towards data use (Aqil et al., 2009).

Various reforms have been implemented in health information systems, which include the compilation and harmonization of health data to establish a valuable resource for informed decision-making in health sector planning. One notable example is DHIS2, recognized as the world's largest HMIS, currently utilized in over 80 countries, many of which are developing nations, including Tanzania (University of Oslo, 2024). DHIS2 is designed to provide insights into health patterns, thereby facilitating informed decisions and guiding actions aimed at enhancing the quality of health services through effective planning (Byrne & Sæbø, 2022; Wilms et al., 2014).

Despite the commendable efforts of the Tanzanian government, the generation and utilization of health data in numerous health facilities continue to face significant challenges due to a range of factors, including technical, organizational, and behavioral issues (Mboera et al., 2021; Rumisha et al., 2020). There remains a critical need for research on the utilization of HMIS data in developing countries. Such studies are essential for understanding the factors that enable effective data use, thereby allowing for timely interventions to ensure the adequate application of health data in the planning of financial resources, human resources, and health commodities for effective and efficient healthcare provision (Byrne & Sæbø, 2022).

This study examined technical, organizational, and behavioral factors influencing the use of HMIS data for health facility planning among health workers in Kigoma region. There has been frequent stock-out of medicine and other medical equipment and a shortage of human resources for health, reaching about 67% and 62%, respectively, in our study area (evidence from Kigoma DC Comprehensive Council Health Plan (CCHP) 2021-2022 and personal communication with District Health Secretary- May 2023), a testament of poor use of existing HMIS data in planning for these resources. We therefore aimed to understand the influence of technical, organizational, and behavioral factors on the use of data for planning. Findings from this study are useful to Council Health Management Teams (CHMTs), facility staff, health facility governing committees (HFGCs), policymakers, implementing partners, researchers, and other stakeholders invested in efforts to improve the performance of DHIS2- data quality and use.

METHODS

Study area

The study was conducted in two districts: Kigoma District

Council (DC) and Ujiji Municipality, encompassing six health facilities selected for their relevance to the research objectives. As indicated in the introduction, the decision to undertake this study in these areas was driven by significant challenges related to using HMIS data. These challenges have resulted in notable planning deficiencies, contributing to a stock-out rate of supplies reaching 67% within a brief timeframe and a human resource shortage of 62%. This information is substantiated by the Kigoma DC Comprehensive Council Health Plan (CCHP) for 2021-2022 and corroborated through personal communication with the District Health Secretary in May 2023.

Study design

This was a cross-sectional explanatory study with a qualitative approach; Kigoma Ujiji and Kigoma DC were used as case studies to generate in-depth information on factors influencing the use of HMIS data at health facilities. A qualitative case study was selected because we wanted to explore a phenomenon (data use) within a certain context (health facilities in Kigoma Ujiji and Kigoma DC) using various data sources (in-depth interviews (IDIs) and focus group discussions (FGDs) with CHMTs and health providers, respectively), to reveal multiple facets (technical, organizational, and behavioral) of the phenomenon, hence discovering details that other research approaches could miss (Tomaszewski et al., 2020).

Study population

The study population included CHMT members, health facility in-charges, and HFGC members. CHMT and co-opted members included the District Health Secretary (DHS), District Medical Officer (DMO), District Reproductive and Child Health Coordinator (DRCHco), District Pharmacist (DPHARM), District Health Management Information System Coordinator (DHMIS), and District Laboratory Technician. Participants were purposively selected due to their roles in HMIS in the study area; they provided rich descriptions of the factors influencing HMIS data use.

We mainly included participants with adequate HMIS experience of at least 6 months. The final sample size was determined by saturation of information. A total of 32 people participated in this study, 20 participants in FGDs and 12 in IDIs. FGDs involved 13 providers and 7 HFGC members, ranging from 3 to 4 per FGD, with both male and female participants. IDIs involved CHMTs and co-opted members- 6 from each District, making a total of 12. Most participants had diplomas, were male, were aged 31 to 40 years, and had work experience of more than 6 years (Tables 1).

Table 1: Study participants' characteristics

Variables	Characteristics	Frequency
Education Status	Bachelor's degree	5
	Diploma	13
	Certificate	8
	Primary education	6
Gender	Male	23
	Female	9
Age (years)	18 -30	4
	31 – 40	16
	41 – 50	8
	>50	4
Work Experience (years)	0 – 1 Year	1
	2 – 5 years	6
	6 -10 years	21
	>10 years	4
Occupation Status	Employees	25
	Non-Employees	7

Study variables and measurements

We adopted the PRISM framework to explain how the broader technical, organizational, and behavioral context within which the HMIS operates influences data use (Aqil et al., 2009). First, organizational factors entail clear roles and responsibilities, commitment, and support to promote data collection, analysis, and use. In addition, a range of resources must be committed, including human resources, supplies, and infrastructure (utilities, information, communications technology). Second, technical factors- a standard set of indicators, trained people, data collection tools, and appropriate information technology- must be available as core resources for HMIS. Third, behavioral factors such as people's motivation, skills and knowledge, values, and attitudes must support data use in planning.

Data collection methods

We used IDIs and FGDs to collect data. Data collection guides were translated to Kiswahili and pretested before data collection. Two research assistants (both female with degrees in public administration in health services management and nursing) conducted interviews. The main researcher (a female with a university degree in public administration in health services management) took field notes. All researchers were trained on the research process, ethics, and aim of the study. Interviews were recorded using digital voice recorders after obtaining consent from participants. The purpose of using IDIs and FGDs was to get an in-depth understanding of the study topic.

IDIs were conducted among CHMTs because of their unique inside knowledge of the study context and topic hence provided detailed in-depth information. FGDs were conducted with health facility personnel because we wanted to get group opinions and experiences on HMIS data use. Only participants and researchers were present during interviews. There was no relationship between researchers and participants prior to the study. However, the first author had previously worked in the study area and had noticed HMIS data use challenges in health facility planning. Familiarity with the study area facilitated selection of the study topic, recruitment of participants, and establishment of rapport. IDIs were conducted in participant offices while the FGDs were conducted at health facilities. IDIs took about 25-35 minutes and FGDs about 35-45 minutes.

Data management and analysis

Audio files were transcribed verbatim; transcripts were stored in a password-protected computer with access only by the researchers. Thematic analysis was used with the help of NVivo software. Thematic analysis is useful in identifying and presenting recurring patterns or themes in data. Data was imported into NVivo (transcripts from FGDs/IDIs). The process of data management and analysis included creating a coding framework where a set of codes was used to organize and analyze the data by grouping related concepts and ideas using the framework created. Data coding involved assigning codes or labels created into a data set, which allowed the researcher to organize data and make it easier to analyze by using NVivo automated coding tools. Data analysis identified themes in the data categorized into technical factors (with sub-themes standard indicators, data collection tools, appropriate IT, data quality, and trained people); organizational factors (with sub-themes availability of resources, organizational culture, and roles and responsibilities); and behavioral factors (with sub-themes staff motivation, knowledge and skills, and attitudes and values,) as guided by the PRISM framework presented above.

Ethical issues

Ethical clearance was sought from MUHAS Institutional Review Board (MUHAS-REC-06-2023-1743). Permission was obtained from Regional Administrative Secretary (RAS) for Kigoma region and District Executive Directors (DED) for Kigoma Ujiji and Kigoma DC in order to conduct research activities within the selected districts. Informed written consent was obtained from all participants. Further, confidentiality, privacy, voluntary participation, and protection of the rights of the respondents were observed. Code numbers instead of participant's names were used during data collection and analysis.

RESULTS

The results are reported in 3 main themes and several sub-themes, as described in the subsections that follow.

Organizational Factors

Availability of resources

Participants revealed a scarcity of HMIS human and financial resources was very common. Limited staffing was the most significant barrier in data collection, processing, and use. It was reported that health provider shortage was about 62.5%. Participants indicated that the staff shortage was partially attributed to the geographical location, which was not conducive to attracting or retaining personnel. Additionally, budgetary constraints were identified as a significant factor contributing to low recruitment levels. While an incentive scheme was introduced to encourage staff retention, its sustainability was hindered by inadequate funding. Furthermore, insufficient financial resources were allocated for essential areas such as staff training and the acquisition of necessary hardware and software, which limited the facility's ability to effectively collect and utilize data. This issue was consistently highlighted by nearly all participants interviewed. For example, one participant noted:

"In our region, we're facing several challenges in utilizing data effectively for health facility planning. Financial constraints and limited staff make it difficult to fully adopt and integrate the system. It's not just about having the system, but also about the resources and personnel required to operate it efficiently." (IDI Participant 8- 28th June 2023).

The study participants expressed further that most of the HMIS-related resources, including forms, supplies, and electricity, were generally available at the health facilities. However, unreliable internet connectivity was a pervasive issue. As a result, it was common for healthcare providers to personally fund internet subscriptions in order to access the system.

"We plan and budget for internet subscription both at facility and district levels; however, sometimes, the funds do not come timely for us to pay for a subscription; we end up using our own internet subscription so that we can capture data timely." (IDI Participant 5- 28th June 2023).

Organizational culture

Participants reported that health facility leadership engaged staff in discussions on data quality and its use. The frequency of these meetings varied by facility, typically occurring on a quarterly, monthly, or weekly basis, with some facilities holding only a few sessions per year. Despite these efforts, several challenges were identified, including insufficient leadership support, a culture that does not prioritize data-driven decision-making, limited staff involvement in decision-making processes, and inadequate collaboration and data sharing between departments. Additionally, participants mentioned other issues such as poor communication channels, a rigid hierarchical structure, the absence of performance incentives and recognition for data use, a lack of designated data champions, and inefficient coordination and collaboration.

Participants emphasized the pivotal role of organizational

support and strong leadership in facilitating effective data use. They noted that when an organization provides sufficient resources, it creates an enabling environment for productive data utilization. A key point highlighted by participants was the importance of understanding the HMIS and its components, with organizational backing being crucial to support this understanding. According to participants, such support distinguishes between efficient data usage and a cumbersome process that can hinder planning activities.

Participants also stressed that leadership that prioritizes data-driven decision-making has the potential to inspire efficient data use among staff. They believed that this approach could lead to the establishment of clear expectations, foster a culture of continuous learning, and create an environment conducive to evidence-based practices. In their view, leaders must proactively address any barriers that could impede the effective use of data in planning, thereby ensuring smooth and efficient operations. Some of the challenges and perspectives shared by participants are captured in the following statements:

"Unfortunately, facility management does not frequently engage health workers to discuss issues related to the HMIS. There is limited communication or feedback channels established, which can hinder effective use and problem-solving." (FGD Participant 15, HF5- 30th June 2023).

Another participant expressed that:

"In this facility, organizational factors play a crucial role in the effective use of data. The absence of a designated data management team, insufficient leadership support, and a culture that does not prioritize data-driven decision-making hinder the full use of available health information." (FGD Participant 12, HF4- 28th June 2023)

Roles and responsibilities

Participants shared that while the roles and responsibilities related to HMIS are generally well-defined at both the health facility and district levels, there is a notable absence of dedicated HMIS teams. In most health facilities, specialized data personnel, such as data clerks, are not employed. Instead, HMIS responsibilities are assigned to staff from various departments within the facility, who typically have additional duties in areas such as reproductive and child health (RCH), pharmacy, and the comprehensive treatment centre (CTC), among others. The facility in charge is ultimately held accountable for the quality and use of data. At the district level, there is an HMIS coordinator who serves as the focal point for HMIS activities. However, participants highlighted that the CHMT plays a critical role in supporting the data review and validation process, as well as providing ongoing supportive supervision to ensure effective data management. During the interviews, participants were quoted as follows:

"First of all, we collaborate in data entry, where facility staff with HMIS knowledge and skills mentor those without. Our role is to make sure there is availability of tools, but also

enter data accurately, and submit report timely.... we also do data quality assessment." (FGD Participant 12, HF4- 28th June 2023).

Technical Factors

Standard indicators

Participants reported that all facilities, as well as staff at the district level, had access to standard HMIS indicators, which were used to guide decision-making and planning. As one participant noted:

"Yes, when you open DHIS2 you find all indicators there on the dashboard." (IDI Participant 6-28th June 2023).

Data collection tools

Regarding data collection tools, participants confirmed the availability of HMIS tools with standardized guidelines in all facilities. One participant explained:

"I can say data use guidelines are available in every tool... they are available at the back of the registers; when you open them, you see instructions. Even if you do not have knowledge, once you read the instructions, you will understand how to use the tools." (FGD Participant 7, HF3- 28th June 2023).

Appropriate technology

Participants acknowledged that while DHIS2 is user-friendly, system instability was a significant issue, with frequent crashes, slow processing, and outdated components. These technical challenges were time-consuming and hindered the efficiency of healthcare delivery, causing delays and lost work. Participants also highlighted the lack of updates and the system's inability to keep up with technological advancements, which further impacted data use. As one participant explained:

"One of the key challenges we face is the instability of our system, which poses obstacles in utilizing the data for health facility planning. Ensuring a stable and reliable system is essential for enabling us to access and analyze data consistently, which is crucial for effective health facility planning." (IDI Participant 2-27th June 2023).

Data quality

Participants reported that investment in HMIS has improved data availability for decision-making at both the facility and district levels, with participants noting that data is easily accessible in DHIS2. However, concerns over data quality, including issues with accuracy, completeness, and reliability, were frequently raised, which undermined its effectiveness for planning. Participants expressed hesitation in using the data for informed decision-making due to inconsistencies, outdated information, and missing elements in datasets. As one participant highlighted:

"Data quality in our HMIS, to me, is a major concern. I frequently find myself doubting the accuracy of the data. There have been instances when the data seemed at odds with

what I had expected based on my previous experiences." (IDI Participant 3-27th June 2023).

Despite these challenges, steps like mentorship, supportive supervision, and data validation are being implemented to improve data quality at the facility and district levels.

Trained people

Participants indicated facilities faced significant challenges due to a lack of trained staff, with no recent formal training and limited resources to implement existing training plans. While there were ad hoc training initiatives, including on-the-job training, webinars, and mentorship, participants noted that inadequate training in data management hindered effective planning and decision-making. As one participant stated:

"Insufficient training hampers our capacity to fully leverage the potential of data in guiding our decision-making processes for health facility planning." (FGD Participant 2, HF1-27th June 2023).

These efforts, though helpful, were insufficient to overcome the broader issue of untrained staff and the lack of consistent training opportunities.

Behavioral Factors

Attitude and values

Most participants expressed a positive attitude toward the value of data, but reluctance to adopt new technologies or processes emerged as a significant barrier. Some health workers were hesitant to embrace the HMIS, either due to comfort with old systems or fear of change. As one participant explained:

"Throughout our team, there's a tangible resistance to change, especially when it comes to embracing new technologies or processes like the HMIS. It's apparent that some of our health workers prefer the comfort of familiar systems rather than adopting the unknown. It's like a balancing act between what they know and what they fear to understand. This hesitant behavior makes our goal of fully utilizing the HMIS for efficient health planning quite challenging." (IDI Participant 5-28th June 2023).

Motivation

While most participants reported positive motivation to use the HMIS, some staff expressed low motivation, often due to the perceived extra workload without corresponding incentives or rewards, as well as a lack of confidence in the system's impact. However, a few participants highlighted that when staff were properly oriented, they found the system user-friendly and beneficial for their daily tasks. As one participant noted:

"For sure they (staff) like the system, they were very happy when I orientated them on the system, they acknowledge the system will be of great help in their daily responsibilities and that it was very user-friendly. I have not received any complaints related to the system." (IDI Participant 7-28th

June 2023).

Despite this, challenges such as staff overload, multiple data entry systems, and unclear incentives continue to hinder full engagement with the HMIS.

Knowledge and skills

There were mixed responses regarding the skill levels and competency of staff across facilities, with some reporting adequate skills while others highlighted low proficiency. The high turnover rate of skilled staff was also a significant concern, impacting the sustainability of effective data use. Errors in data entry were frequently attributed to negligence, lack of focus, or misunderstanding of the HMIS, which compromised data integrity and hindered its effective use for health planning. As one participant noted:

"One of the recurring issues we're grappling with is errors in data entry. It could be due to negligence, lack of focus, or even an insufficient understanding of the HMIS. We often find mistakes that could have been avoided if more attention was paid or if there was better comprehension of the system. These data entry errors not only compromise the integrity of our data but also hamper our efforts to effectively use data for health planning." (FGD Participant 5, HF2- 27th June 2023).

DISCUSSION

One of the prominent issues in this study is the inadequate staff, which obstructs the effective use of HMIS data within health facilities in Kigoma Ujiji and Kigoma DC. Several participants expressed concerns about the shortage of human resources dedicated to HMIS, making it challenging to extract full benefits from the system. Limited staffing indicates a resource constraint within the facilities, which can hamper the effectiveness of HMIS data use. Staff who lack skills or are overwhelmed by workload may be unable to use HMIS data efficiently (Braa et al., 2012). Recruitment of adequate staffing with specialized HMIS expertise is essential to ensure that data is collected and used effectively for health facility planning (Ministry of Health, 2019). Furthermore, organizational support and leadership are critical factors in driving the effective use of data. Commitment from leadership can translate into better resource allocation, the establishment of clear data management policies, and the fostering of a culture that values data-driven decision-making (Chaulagai et al., 2005). To drive data quality and use, a culture of open communication, data sharing, feedback, and recognition is essential.

The findings reveal that technical factors, particularly system stability, data quality, and trained people, are essential to the use of HMIS data in health facilities. Participants reported encountering instances of system crashes and slow response times, which indicate system instability. These technical issues are detrimental to the usability and reliability of HMIS data, subsequently affecting health facility planning. System instability highlights the importance of reliable and

robust technical infrastructure. Also, technical glitches, slow processing times, and lack of system updates can impede staff's ability to access and analyze data efficiently. Such system instabilities could be attributed to outdated hardware, lack of maintenance, or inadequate server capacity. This resonates with findings from similar studies that emphasized the importance of reliable systems for effective data use (Kiberu et al., 2014; Wandera et al., 2018). A stable system ensures that health workers can access and enter data without interruption, which is essential for decision-making.

Data quality was also a concern raised by participants. Data quality is quintessential for informed decision-making. Incomplete or inaccurate data can lead to incorrect conclusions and misguided decisions (Wandera et al., 2018). Also, ensuring data accuracy and reliability is foundational for building trust among health workers in the data they are utilizing (Gatara et al., 2021). The quality of data includes various aspects, such as accuracy, completeness, consistency, and reliability. Low-quality data, which is often marked by inaccuracies and inconsistencies, can undermine the credibility and usefulness of HMIS for planning purposes. Additionally, the timeliness of data is a vital factor in determining its quality. Delays in data entry or the availability of information can impede the ability to make informed and timely decisions. As a result, health facilities may struggle to respond to emerging health issues or may allocate resources inefficiently (Ministry of Health, 2019). Timely data is essential for decision-making, especially in dynamic healthcare environments.

Addressing technical challenges necessitates a substantive investment in robust technical infrastructure. This investment encompasses the upgrading of hardware, ensuring regular maintenance, and enhancing server capacity. Furthermore, the implementation of stringent data quality assurance mechanisms, potentially through automated validation checks, is essential for improving data quality. Healthcare facilities must cultivate a culture that prioritizes prompt data entry and reporting to guarantee the timeliness and reliability of information. In addition, considering the rapid pace of technological advancements, the exploration of cloud-based solutions is a critical consideration. Such solutions offer a myriad of advantages that can effectively address some of the system stability concerns identified in the study. For example, cloud-based electronic health record (EHR) systems provide scalability, reliability, and enhanced security (Ahmadi & Aslani, 2018; Woldemariam & Jimma, 2023). These cloud solutions, which serve as IT resources for delivering internet application services from data centers, such as hosted EHR systems, facilitate easy access to health information from any location at any time. This accessibility promotes seamless collaboration and data sharing among healthcare providers. Additionally, these systems include built-in data backup and disaster recovery capabilities, ensuring that critical health information is safeguarded against system failures or natural disasters.

Furthermore, cloud-based solutions alleviate the burden of maintaining on-premises servers, as the responsibility for infrastructure management lies with the cloud service providers (Ahmadi & Aslani, 2018). This not only reduces costs but also ensures high system availability and reliability. Cloud providers have the expertise and resources to maintain robust infrastructure, resulting in improved system stability and reduced downtime for health facilities. Another advantage of cloud-based solutions is their enhanced security measures. To protect sensitive health data, cloud service providers implement stringent security protocols, including encryption, access controls, and regular security updates. These measures address data breaches and unauthorized access concerns, providing a secure environment for storing and managing health information.

Moreover, health facilities were fraught with insufficient on-job training on HMIS use. On-job training is fundamental for capacity building; without such skills, data management, interpretation, and utility become severely limited (Aqil et al., 2009). The issue of training, as observed in our study, is in alignment with findings from similar studies depicting the centrality of human resources in the functionality of health information systems (Mboera et al., 2021; Mutale et al., 2013). They argued that these systems, no matter how technically advanced, would be ineffective without adequate manpower. Similarly, Hotchkiss et al. (2010) pinpointed human resource constraints as a recurring bottleneck in the effective use of health information systems in developing countries (Hotchkiss et al., 2010).

Findings suggest that behavioral challenges such as poor attitude, lack of motivation, and inadequate knowledge and skills influence the use of data in Kigoma Ujiji and Kigoma DC health facilities. Resistance to change is often attributed to a lack of understanding or fear of the new system, as indicated by the participants. This resistance can be fueled by apprehension about the complexity of the system or concerns about potential changes in job roles that new systems may bring. The resistance to change corroborates with studies that recognize the challenge of adapting to new technologies in healthcare settings (Maillet et al., 2015; Milella et al., 2021). As noted by Kwamie (2015), fostering an environment that supports change is essential in overcoming this resistance (Kwamie, 2015).

Motivation among health workers can also be a factor that contributes to the suboptimal use of HMIS. When health workers are not motivated, there may be a lack of commitment or interest in learning and using the new system effectively. This is consistent with the findings of Milella et al. (2021), who suggested that motivational factors are crucial in ensuring the adoption and effective use of health information systems (Milella et al., 2021). Enhancing motivation through incentives, recognition, and the creation of a supportive work environment can have a positive impact (Mboera et al., 2021; Rumisha et al., 2020).

HMIS use can also be affected by individual skills and

knowledge limitations, which are linked to errors in data entry (Aqil et al., 2009). These errors can stem from a lack of training or understanding of the importance of accuracy in data entry. Incorrect or incomplete data entry can significantly affect data quality, rendering it unreliable for decision-making and planning. Data entry errors highlight the significance of attention to detail and the understanding of the system. Such errors can compromise the quality of data and, consequently, the utility of HMIS. Training and continuous education can play a vital role in improving knowledge and skills (Rumisha et al., 2020).

Engaging healthcare workers through training programs tailored to improve their understanding and competency in using the HMIS is important. This can alleviate fears and apprehension and reduce resistance to the new system. Secondly, instituting motivational strategies is vital. Intrinsic motivation can be enhanced by recognizing and rewarding employees who show proficiency in using the system. Additionally, creating a supportive environment that encourages learning and development can foster a sense of ownership and commitment among healthcare workers. Finally, change management strategies are critical in mitigating resistance. Effective communication of the benefits and importance of the new system, coupled with the involvement of health workers in the decision-making process, can foster a positive attitude and acceptance of change. Using behavior change theories like the Technology Acceptance Model can help understand factors affecting the acceptance and use of technology among health workers and can be helpful in developing interventions (Holden & Karsh, 2010).

IMPLICATIONS OF THE STUDY

Findings show that most HMIS data use challenges emanate from inadequate HMIS technical personnel, poor organizational culture, ICT hardware and software problems, poor data quality, inadequate training, and behavioral issues. Efforts to address these challenges require sufficient financial resources at the council and facility levels. Further, implementation science research can be conducted to guide behavioral change interventions to boost the use of DHIS data at the facilities.

STUDY LIMITATIONS

First, use of qualitative approach alone has limited our ability to quantify the magnitude of influence of each factor in data use. Second, face-to-face interviews can intimidate participants due to the presence of researchers, causing reluctance to share information openly for fear of the unknown, thus limiting the depth and accuracy of information obtained. Third, there were some concerns among participants that their opinions could jeopardize their jobs. This can affect their engagement and openness during interviews, potentially affecting quality and reliability of the findings. Despite the limitations, this study communicates essential information about HMIS data use in Tanzania.

CONCLUSIONS

While the implementation of DHIS2 has significantly enhanced the availability of health data in facilities, its effective use for planning and decision-making remains hindered by several critical challenges. These include a shortage of skilled technical personnel, organizational barriers such as a poor information culture, ICT infrastructure issues, inconsistent data quality, insufficient training, and negative staff attitudes towards data management. To improve the utilization of HMIS data in health facility planning, this study underscores the need for targeted health system interventions that address staffing gaps, enhance training programs, foster a data-driven organizational culture, improve data quality, and address behavioral barriers among staff. By tackling these issues, health facilities will be better equipped to leverage data effectively, ultimately leading to more informed decision-making and improved healthcare outcomes.

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Conflicts of Interest

The authors declare that they have no competing interests.

Author's Contributions

Zawadi Dakika contributed to the study design, acquired, analyzed, interpreted data, and drafted the manuscript. Happiness Pius Saronga contributed to the study design, interpreted data, and drafted the manuscript.

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