Health Information Management System Data Utilization in Strategic Management Decision Making in Hospitals: Systemic Review

[1]Jeremiah Osida Onunga., [2]Sharon Anyango Onditi., [3]Paul Onyango Odongo

[1]Lecturer, Department of Renewable Energy and Technology, Turkana University College

[2]Lecturer, Department of Education, Psychology and Science, Rongo University

[3]Assistant Lecturer, Department of Arts and Social Sciences, Turkana University College

DOI: https://doi.org/10.51244/IJRSI.2025.121500063P

Received: 20 January 2025; Accepted: 01 February 2025; Published: 09 May 2025

ABSTRACT

A health information system is a structured effort to systematically collect, store, and share data essential to the effectiveness of a health system, encompassing various health-related functionalities. Gathering, organizing, and analyzing data is crucial to identify the health needs of a population, providing hospital management with insights to allocate resources effectively across the health workforce, essential medications, governance, and service provision. However, although hospitals typically rely on their staff to handle data, these key administrative responsibilities often lack support for using data to make informed decisions, leading to poor service delivery and unnecessary patient referrals. This desktop review explored how hospital management employs the Health Information Management System for strategic decision-making and identified challenges and barriers to leveraging this data. The review sourced materials from three databases, two journal websites, and Google Scholar, using search terms like "Health Management Information System," "Strategic management," "Decision-making," "health data," and "barriers to data use." The analysis followed the Preferred Reporting Items for Meta-analysis and Systematic Review, resulting in 35 articles identified, with seven selected for inclusion after evaluation. Findings revealed that hospital management teams seldom use Health Management Information for decision-making, and health workers similarly underutilize this data for critical choices. Technical and organizational factors significantly hinder the use of Health Management Information for strategic decisions aimed at enhancing service delivery. To overcome these obstacles, the review suggests regular supportive supervision, training, capacity building, mentoring on basic health information skills, and improved feedback through collaboration among policymakers and stakeholders. Hospital administrators should promote a culture that values routine health information for evidence-based decisions across all areas by boosting resources, providing tools, computers, skilled staff, and automation, while offering regular refresher training to keep health personnel adept at using the system and emerging technologies. Management should prioritize the value of information and foster leadership to encourage positive attitudes toward its use. This review provides a valuable resource for informing the government about the initiative's current status and hospital managers' data management capabilities for relevant programs, while offering researchers ample material for deeper exploration.

Keywords: Hospital, Management, Decision-making, Strategic Management, barriers, health, data, and Health Information Management System.

INTRODUCTION

A health management information system is a framework that facilitates the gathering, storing, compiling, transmitting, analyzing, and using of health data to help stakeholders and decision-makers manage and allocate resources at all health service levels (Ammenwerth E, Rigby M. 2016). The primary goal of the health management information system is to consistently provide high-quality health data that offers targeted

ISSN No. 2321-2705 | DOI: 10.51244/IJRSI |Volume XII Issue XV April 2025 | Special Issue on Public Health

information support for decision-making at every stage of the health system to enhance the delivery of healthcare services.

Health information is the processed and generated data that an individual, group, or institution uses to support their decisions in the health care system (Mekonnen BD, Gebeyehu SB, 2021). Routine health information use is critical for day-to-day patient management, illness prioritization, health education, resource allocation, and decision-making, as well as planning, monitoring, and evaluating healthcare service operations (Mekonnen BD, Gebeyehu SB, 2021). A well-operating health information system helps to get the correct information to the right people at the right time, allowing policymakers, managers, and care providers to make evidence-based decisions (Moses Ochieng Otieno, *et, al.* 2020).

In developing countries, the utilization of routine data for decision-making remains very weak mainly due to inadequate data analysis and health information systems. Though most healthcare providers report routine health data, understanding the benefits of routine health information and utilization remains low in low-income countries. As a result, data usually sat on shelves, and cabinets without being sufficiently processed and utilized for program and policy improvements. This leads to challenges and difficulties in the efficiency and effectiveness of healthcare delivery (Mekonnen BD, Gebeyehu SB (2021).

The current Kenya Health Sector Strategic Plan (2018-2023) considers HMIS as a key source of information for monitoring and revising policy execution and resource allocation and strengthening the timely generation and use of integrated, comprehensive, high-quality health information; strengthening the health information validation system; enhancing analysis capacity at all levels for improved decision-making; strengthening systems for the predictable and targeted dissemination of information to all stakeholders; improving the use of health information to guide policies, planning, and program management; and improving health information governance. (Kenya Health Sector Strategic Plan (2018-2023))

Utilization of health information data still faces challenges and barriers by the hospital management teams. Insufficient Skills in data use core competencies, poor data quality, Inadequate availability of data, low individual commitment and motivation, attitude toward Health Management Information Systems, competency, System design, information use culture, Relationships between actors who produce and use data, leadership for data use, resource shortage, decisions based on superior directives, computer access, reference material, reporting format, performance monitoring by health professionals are some of the barriers and challenges that influence the utilization in hospitals management. (MEASURE Evaluation, 2018)

Despite increased emphasis on improving evidence-based decision-making through strong governance, transparency, and accountability, utilization of Health Management Information System is still underutilized in hospitals (Mekonnen BD, Gebeyehu SB (2021). As a result, this desktop review focuses on understanding how efficiently the Health Management Information System is used by hospital management teams to achieve the desired results in making strategic decisions for improving healthcare services, as well as reviewing challenges and barriers leveraging Health Management Information System data in strategic management decision making. The review provides excellent contributions to researchers and all stakeholders.

Statement of Problem

Health information is an effective tool for improving community health since it identifies both problems and opportunities for improvement (Wude H, *et al,* 2020)). Despite routine health information being used in operational, tactical, and strategic decision-making, poor data quality and restricted application are still key challenges. Data is not successfully checked and analyzed, resulting in poor data quality, including incomplete, inconsistent, and erroneous data, as well as a significant backlog of unprocessed data across multiple databases. A vast amount of research has been conducted on the factors that influence routine usage of health information. However, the investigated research does not explain how usage determinants influence routine health information use. (Karijo, *et al.* 2021).

Reliable and timely health information is essential for policy development, proper health management, evidence-based decision-making, rational use of resources, and the monitoring and evaluation of the public health situation, health care delivery, and outcomes (WHO, 2019). The purpose of this review study was to identify gaps in existing research about the ineffective use and decision-making of Health Management Information

ISSN No. 2321-2705 | DOI: 10.51244/IJRSI |Volume XII Issue XV April 2025 | Special Issue on Public Health

Systems in hospitals by Health Management Teams, as well as how Health Information Systems can be successfully used to improve the healthcare system. Hence, there is a need for improvement in the use and management of health information.

Objectives

The review was guided by the following objectives:

i. To examine how hospitals use health information data to make strategic management decisions.

ii. To evaluate the obstacles and barriers to using HMIS data for strategic management decisions in hospitals.

iii. To provide recommendations to improve the use of HMIS data in hospital strategic management decisions.

METHODOLOGY

A systematic review was done by searching main databases, Web of Science, Google Scholar, PUBMED, Global Health, and African Journal Online using related keywords; Health Management Information System, Strategic Management, Decision-making, Health Data, and barriers to Data Use. This systematic review was prepared and presented based on Preferred Reporting Items for Systematic Reviews (PRISM). After the evidence quality appraisal, data was extracted and analyzed via thematic analysis. Publications throughout 2018-2023 in the English language were selected for this work from the aforementioned sources.

Thirty-five (35) articles on the usage of Health Information System data and the barriers/challenges affecting its use in strategic management decisions were extracted and classified using the Performance of Routine Information System Management (PRISM) framework. The steps involved in identifying relevant e-resources for the systematic review were searching, screening, eligibility, and inclusion. Searching was conducted using the key terms listed above. Then, the records were thoroughly screened to eliminate non-relevant records by reading the titles, abstracts, and finally the full texts, based on the set inclusion/exclusion criteria. Duplicates were eliminated by using EndNote software.

To eliminate bias, screening of the abstract and full text was done by two researchers separately and the results were compared. After the screening activity was completed, the selected articles were checked for completeness and retained for the review work. Finally, seven articles were found eligible for the present review with the agreement of both researchers and then information abstraction from the findings of the selected articles was performed to produce this systematic review article. To this end, the analysis method used was mainly synthesizing.

The abstracted information was categorized based on the themes including; the utilization of Health Management Information System data in decision-making, the challenges and barriers to using Health Management Information System data in strategic decision-making, and opportunities for improvement.

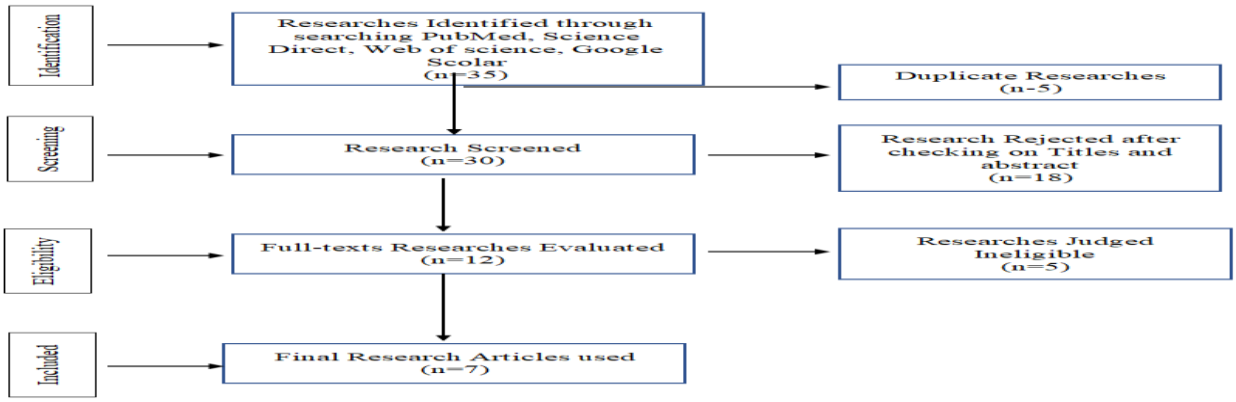

Fig 1: PRISM flow chart showing the steps involved in identifying relevant e-resources for the systemic review. Where n = number selected after screening at different levels

ISSN No. 2321-2705 | DOI: 10.51244/IJRSI |Volume XII Issue XV April 2025 | Special Issue on Public Health

RESULTS

The search activity returned a total of 35 records of which 5 were excluded because they were duplicates. After reading the title and abstracts, 18 articles were excluded from the 30 retained records due to duplication and also since full texts could not be obtained for some. The remaining 12 articles were further assessed for eligibility, and finally, 7 articles were included for this final review as they met the criteria. The steps followed to this end are depicted in Figure 1. Findings were categorized into three themes: Utilization of Health Management Information System in Strategic decision-making; Challenges and barriers to utilization of the HMIS and Recommendations

Use of Health Management Information in Decision-Making

Health Management Information Systems (HMIS) play a crucial role in healthcare organizations by providing valuable data and information that support decision-making processes. These systems are designed to collect, store, manage, and transmit health-related data to facilitate efficient management of healthcare services. The use of HMIS enables healthcare providers to make informed decisions regarding patient care, resource allocation, financial management, and strategic planning.

One of the key benefits of HMIS is its ability to improve the quality of patient care. By capturing and analyzing patient data, healthcare providers can identify trends, patterns, and potential risks that may impact patient outcomes. This information allows healthcare professionals to develop personalized treatment plans, monitor patient progress, and make timely interventions when necessary. Additionally, HMIS can help reduce medical errors by providing accurate and up-to-date information to healthcare providers.

HMIS also plays a critical role in enhancing operational efficiency within healthcare organizations. By automating routine tasks such as appointment scheduling, billing, and inventory management, HMIS can streamline workflow processes and reduce administrative burden. This allows healthcare providers to focus more on delivering quality care to patients rather than on paperwork and manual tasks. It also enables evidence-based decision-making by providing access to real-time data on key performance indicators such as patient outcomes, resource utilization, and financial performance.

The use of Health Management Information Systems has become essential in modern healthcare settings as it provides valuable insights that enable informed decision-making at all levels of an organization. By leveraging the power of data analytics and technology, healthcare providers can enhance the quality of care they deliver while also optimizing their operations for better efficiency and effectiveness.

Barriers And Challenges Influencing Data Use In Decision Making

Based on the study review of the articles conducted, revealed a mixture of factors and barriers including Technical and Institutional factors that affect the effective use of HMIS data for strategic decision-making by hospitals. Health information management systems play a crucial role in healthcare organizations by providing a platform for storing, managing, and analyzing patient data. However, several barriers and challenges can hinder the effective utilization of these systems in decision-making processes. (MEASURE Evaluation, 2018)

One of the primary barriers to the utilization of health information management systems in decision-making is the lack of interoperability between different systems. System design and development, particularly in terms of complexity and usability, might restrict data quality and use, as well as decision-making. Healthcare organizations often use multiple systems that do not communicate with each other effectively, leading to fragmented data and hindering the ability to make informed decisions based on comprehensive information. Designing responsive information systems necessitates system designers understanding what information is helpful and necessary for decision-making.

Poor quality data is data that is not sufficiently timely, reliable, accurate, or complete and cannot be effectively used to track program performance, resulting in a detrimental influence on strategic planning and decision-making. Inadequate data quality reduces decision-makers confidence and value in data, which influences future

ISSN No. 2321-2705 | DOI: 10.51244/IJRSI |Volume XII Issue XV April 2025 | Special Issue on Public Health

demand for data in decision-making processes. Inaccurate or incomplete data can lead to incorrect conclusions and decisions being made based on faulty information. Ensuring data integrity and accuracy is essential for utilizing health information management systems effectively in decision-making processes.

Core competencies in data analysis, interpretation, synthesis, presentation, and the formulation of data-driven recommendations are required at all levels of a health system to improve data demand and usage. Data producers must be able to access, analyze, evaluate, and synthesize data so that decision-makers can understand it. Data consumers (those who use data for program improvement and development) need the ability to assess, critically review, and interpret analyses, as well as translate information into programs, plans, and policies. Poor training in technical skills and support systems to produce trustworthy information influences data quality for decision-making.

The lack of access to the most relevant data for decision-makers is a significant impediment to its utilization. Available data is not necessarily matched with decision-makers needs and has access constraints. Decision-makers may not have access to all important data sources for making program management decisions, including information related to other healthcare tasks. Raw data sets are frequently difficult to get, restricting the ability to support trends, output, and outcome analyses, and identify and explore site-specific concerns. How information is synthesized, packaged, and transmitted to decision-makers influences its availability and consequently use in decision-making.

Decision-making autonomy frequently rests outside the purview of the health sector, restricting decision-makers ability to act on data-driven suggestions. In Kenya, county governance structures influence the extent to which data-driven suggestions are implemented. While the country's health sector strategic plans outline strategic objectives, activities, targets, resource requirements, and financing requirements that may be evidence-based, other authorities in charge of upstream budgeting in the county-wide, cross-sector integrated development plan have the final say over the plan's activities and budget.

Organizational architecture can either hinder or facilitate a culture of data-driven decision-making. To make data use a regular and sustainable activity, effective organizational supports are required to promote the skills, processes, and relationships required to use information, as well as to outline the coordination and management practices required to ensure cross-team sharing and information exchange. The lack of tools and processes to support M&E and data use activities, such as data quality assurance protocols, supportive supervision, enough time allocation for M&E activities, and regular feedback mechanisms, can have a negative influence on the data's perceived importance and value.

Individual attitudes, goals, and values all have an impact on data consumption. Low commitment to work and morale among health workers can exacerbate low incentives to use data among employees. Individual hurdles to the use of health information include unfamiliarity with technology and reluctance to innovate and new work processes (especially if connected with increased work burden or a lack of perceived utility). Additionally, resistance to change among healthcare professionals can impede the adoption and utilization of health information management systems. Some individuals may be reluctant to embrace new technologies or workflows, leading to underutilization of these systems in decision-making.

Research in Africa and Asia has found that a lack of data use is linked to ineffective leadership for evidence-based decision-making. Top-level decision-makers give data minimal priority because they believe the quality is poor. Leadership support has been identified as the most critical factor driving information utilization. Senior decision-makers and political leaders can shift organizational norms by verbally and financially supporting data use and setting an example in demanding health information, using it to develop policies and programs, and freely sharing data.

Security and privacy concerns also pose significant challenges to the utilization of health information management systems. Healthcare organizations must comply with strict regulations regarding patient data protection, which can limit the sharing and accessibility of information necessary for making informed decisions.

ISSN No. 2321-2705 | DOI: 10.51244/IJRSI |Volume XII Issue XV April 2025 | Special Issue on Public Health

DISCUSSION

The use of routine health information can potentially circumvent several of the structural and systemic barriers faced by health workers in delivering health care. Some studies suggested that the use of routine health information for healthcare delivery was feasible for health workers irrespective of their education or prior training. The also study revealed that health workers did not use their routine health information appropriately to make decisions.

The study also revealed that the utilization of Health Information data by health management for decision-making was influenced and affected by several barriers and challenges such as insufficient skills in data use core competencies, data quality and accuracy, inadequate availability of data, staff attitude and resistance to change, leadership for data use, information safety and security, decisions based on superior directives, computer access, reference material, reporting format are some of the barriers and challenges that influence the utilization of HMIS.

To improve the success of HMIS utilization in hospitals, the study found that improving planning and coordination of HMIS projects, capacity building through user training, knowledge and skills transfer, procurement of information systems, involvement of users in system requirement definition, involvement of managers at all levels, sufficient software and hardware evaluation, and the use of change agents in implementation, will greatly improve the utilization of HMIS. Recruitment of qualified managers to spearhead HMIS implementation will boost HMIS utilization. The establishment and equipping of the IT department to spearhead automation, the development of IT strategy, and enterprise architecture was paramount.

CONCLUSION

The systemic study concluded that health managers frequently did not use regular health information in making valuable strategic decisions in the hospitals. Technical, organizational, and institutional factors were found to have significant effects on the utilization of routine health information systems. Regular supportive supervision, training, capacity building, and mentoring on the competency of basic health information tasks and strengthen regular feedback through a collaborative effort of policymakers, programmers, implementers, and other concerned stakeholders. Furthermore, boosting the accessibility and availability of standard HMIS guidelines is vital for scaling up information use.

RECOMMENDATIONS

The hospital administrators should foster an organizational culture by increasing the demand for and utilization of routine health information for evidence-based decision-making in all domains. Also, hospital management must increase organizational resources to facilitate information use at all levels, including the supply of tools, computers, qualified individuals, and automation. It should also provide frequent refresher training to ensure that health personnel are up to date on how to utilize the HIS and new technologies. There is a need for management structures to put emphasis on information values and build leadership on information use to enhance favorable attitudes towards using information.

The Ministry of Health, the County Health Management Team, and development partners to implement additional tactics to reinforce and ensure that decision-makers request more HMIS data for planning, prioritization, management, and forecasting. The National Government and County Governments should play an important role in management support by providing support supervision, feedback on reports and information sharing, and review forums to improve information sharing at the health facility level. Finally, further research is suggested for assessing health workers' culture of health information utilization at the lower health facilities where data are generated.

REFERENCES

1. Government of Kenya. (2010-2030). Health sector: Health information system policy. HIS policy report.

ISSN No. 2321-2705 | DOI: 10.51244/IJRSI |Volume XII Issue XV April 2025 | Special Issue on Public Health

2. Kanfe, S. G., Endehabtu, B. F., Ahmed, M. H., Mengestie, N. D., & Tilahun, B. (2021). Commitment Levels of Health Care Providers in Using the District Health Information System and the Associated Factors for Decision Making in Resource-Limited Settings: Cross-sectional Survey Study. JMIR Medical Informatics. https://doi.org/10.2196/23951.
3. Karijo, E. K., Otieno, G. O., & Mogere, S. (2021). Determinants of Data Use for Decision Making in Health Facilities in Kitui County, Kenya. Quest Journal of Management and Social Sciences.
4. Mekonnen, B. D., & Gebeyehu, S. B. (2021). Routine Health Information Utilization and Associated Factors among Health Care Workers in Ethiopia: A Systematic Review and Metaanalysis. PLoS ONE, 16(7), 1–16. https://doi.org/10.1371/journal.pone.0254230
5. Mekuria, S. (2021). Utilization of Routine Health Information System and Associated Factors Among Health Professionals in Public Health Facilities in Dire Dawa, Eastern Ethiopia: a Cross-sectional Study. Health Information System.
6. Moses Ochieng Otieno, Lillian Muiruri, D. C. K. (PhD). (2020). Factors Related To Quality Data Which Determine Health Information Utilization in Making Decisions Among Healthcare Managers in Mombasa County, Kenya. American Journal of Public Policy and Administration. https://ajpojournals.org/journals/index.php/AJPPA/article/view/523/649
7. MEASURE Evaluation (2018). Barriers to Use of Health Data in Low- and Middle-Income Countries—A Review of the Literature
8. Otieno, M. O., Muiruri, M. L., & Kawila, C. (2020). Organizational Determinants Of Health Information Utilization In Making Decisions Among Healthcare Managers In Mombasa County, Kenya. Journal of Health Medicine and Nursing, https://www.iprjb.org/journals/index.php/JHMN/article/view/1075/1189
9. PRISMA [Internet]. [cited 2020 Sep 15]. Available from: http://www.prisma-statement.org/Extensions/ScopingReviews
10. Sebsbie, A. (2021). Assessment of Routine Health Information Utilization and Associated Factors among Public Health Centers in Addis Ababa, Ethiopia, 2020. Addis Ababa University.
11. Wude, H., et.al…….. (2020). Utilization of Routine Health Information and Associated Factors among Health Workers in Hadiya Zone, Southern Ethiopia. PLoS ONE. https://doi.org/10.1371/journal.pone.0233092