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Systematic review: The impact of Hospital Information Management System (HIMS) implementation on administrative performance and patient service quality in hospitals

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Abstract

Digital transformation in the healthcare sector has driven the adoption of Health Information Management Systems (HIMS) in various hospitals as an effort to improve administrative efficiency and the quality of patient care. This systematic review synthesizes current evidence to address three pivotal research questions: (1) The impact of HIMS implementation on administrative performance, (2) HIMS effects on the quality of patient care, and (3) the facilitating and restraining factors influencing successful implementation. The literature search process was conducted through several international scientific databases in databases such as Scopus, ScienceDirect, GoogleScholar. This study employed a Systematic Literature Review (SLR) design based on the Preferred Reporting Items for Systematic Reviews and Meta-Analyses. PICO includes hospitals (P), HIMS implementation (I), conditions without/before HIMS (C), and performance improvement and service quality (O). Inclusions include full-text empirical studies from 2019–2025 on HIMS, while exclusions include non-empirical articles, opinion pieces, and studies outside of healthcare. The results of the study yielded 19 studies that met the inclusion criteria. The analysis results indicate that HIMS implementation generally contributes positively to time efficiency, data accuracy, and the reduction of administrative errors. In terms of patient care, this system has been shown to increase satisfaction, shorten waiting times, and expand access to healthcare services. However, implementation effectiveness is heavily influenced by factors such as human resource readiness, management support, technological infrastructure, and perceived ease of use of the system. Despite its numerous benefits, challenges such as inconsistent data quality, limited training, and resistance to change remain major barriers. This study emphasizes the importance of a holistic approach to HIMS implementation that focuses not only on technology but also on human and organizational aspects to achieve sustainable results.

Keywords: Hospital management information system, Administrative efficiency, Patient care quality, Healthcare digitalization, HIMS implementation success factors

Introduction

Digital transformation in the healthcare sector has encouraged hospitals to strengthen information governance through the implementation of Hospital Information Management Systems (HIMS), which integrate administrative and clinical processes such as patient registration, electronic medical records, financial management, and human resource management. Implementation of this system is expected to improve administrative efficiency, data accuracy, and service quality, particularly in developing countries like Indonesia, which face complex service delivery and demands for data-driven accountability (Lei et al., 2021; Taneja & Singh, 2025).

Despite offering substantial benefits, HIMS implementation still faces various structural obstacles, ranging from limited technological infrastructure, low human resource capacity, and weak organizational commitment. Numerous studies confirm that these obstacles frequently impede system optimization, resulting in administrative errors and compromised service coordination (Lei et al., 2021; Hoxha et al., 2022). In the Indonesian context, these challenges are further exacerbated by disparities in resource allocation and varying levels of organizational readiness (Avila & Gil, 2025).

On the other hand, several studies have shown that a well-managed HIMS can speed up administrative processes, improve patient safety, and strengthen service audit and monitoring processes. Health information management professionals play a crucial role in maintaining data quality and supporting system-based reporting and oversight processes (Kemp et al., 2021). Empirical findings also indicate that the use of information technology in hospitals can improve time efficiency and reduce operational costs (Taneja & Singh, 2025).

However, the literature shows inconsistent results

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regarding the impact of HIMS implementation. Some studies report improvements in administrative performance and patient satisfaction, while others highlight low user adoption, healthcare worker resistance, and limited training as key barriers to maximizing the system's benefits (Hoxha et al., 2022; Lei et al., 2021). These inconsistent findings highlight a knowledge gap regarding the extent to which HIMS truly improves hospital performance.

Furthermore, data quality is a critical factor in the success of HIMS implementation. Accurate data supports effective decision-making, improves administrative efficiency, and strengthens patient care. Conversely, poor data quality can undermine user trust, trigger administrative errors, and hinder optimal system utilization (Ghalavand et al., 2024). This situation underscores the importance of a comprehensive evaluation of data quality in hospital information systems.

Addressing this identified literature gap, a systematic review is warranted to synthesize empirical evidence on the impact of Health Information Management Systems (HIMS) implementation on both administrative performance and patient care quality. This review specifically aims to answer the following questions: (1) How does HIMS implementation influence hospital administrative performance, (2) to what extent this system improves patient care quality, and (3) the key enabling and inhibiting factors. Therefore, the results of this review are expected to provide a basis for policymakers and hospital management in formulating effective and sustainable digitalization strategies (Lei et al., 2021; Avila & Gil, 2025). This research contributes to the hospital management literature by providing up-to-date evidence on the benefits and challenges of HIMS implementation. For policymakers and hospital administrators, the results can serve as a basis for developing efficient digitalization strategies oriented toward improving service quality.

Literature Review

Hospital digitalization through a Hospital Information Management System (HIMS) is a key strategy for improving administrative performance and the quality of patient care. Numerous studies have shown that digital health technology can accelerate service processes, improve data accuracy, and strengthen clinical and administrative coordination (Awad et al., 2021; Barbieri et al., 2023; Mitchell & Kan, 2019). In many countries, HIMS has become an indicator of hospital digital maturity and a crucial tool for data-driven management (Canfell et al., 2024; Davidson et al., 2020).

However, the effectiveness of HIMS depends heavily on data quality, organizational readiness, and human factors. Several studies have confirmed that inaccurate data, manual recording practices, and low user competency are crucial barriers, particularly in low- and middle-income countries (Adane et al., 2021; Hoxha et al., 2022; Lemma et al., 2020; Solomon et al., 2021; Jam et al., 2025). Furthermore, inter-unit integration, top management support, and user-friendly system design are key factors for successful implementation (Avila & Gil, 2025; Kemp et al., 2021; Noël et al., 2020).

From an administrative performance perspective, evidence suggests that hospital information systems can accelerate workflows, increase cost efficiency, and improve data management through automation of registration, claims, and reporting processes (Taneja & Singh, 2025; Fu et al., 2022; Luo et al., 2024). At the same time, HIMS have been shown to impact the quality of patient care, particularly through reduced wait times, increased speed of decision-making, and improved interprofessional coordination (Çetin et al., 2021; Dormann et al., 2020; Nguyen et al., 2022; De Siqueira Silva et al., 2024). Patient digital literacy and user experience are also important factors in determining patient satisfaction in the era of digital healthcare (Koca et al., 2025).

While the benefits of HIMS are clear, their implementation is not always optimal. Challenges such as limited infrastructure, user resistance, lack of training, and low utilization of routine data remain common (Lei et al., 2021; Oladoyin et al., 2025; Wagenaar et al., 2016). Thus, a comprehensive understanding of how HIMS impacts administrative performance and patient care quality across various hospital contexts is needed.

The rationale for this systematic review is to synthesize the latest evidence on the impact of HIMS implementation on two key aspects of hospital performance: administrative and care quality, and to identify success factors and barriers identified in

various international studies. Given the rapid development of digital transformation and the diverse research findings over the past two decades, a systematic review is needed to provide a structured overview of the effectiveness, challenges, and opportunities for improvement in hospital information systems.

Hospital Information Management System (HIMS)

A Hospital Information Management System (HIMS) is a crucial part of digital transformation in modern hospitals, serving as an integrated system that manages all administrative and operational aspects of healthcare services. HIMS encompasses various modules such as patient registration, electronic medical records, financial management, logistics, pharmacy, and managerial reporting. Its goal is to improve efficiency, reduce administrative errors, accelerate decision-making, and strengthen coordination between hospital units. According to Lei, Liu, and Li (2021), HIMS in developing countries still faces various challenges related to infrastructure readiness, human resources, and integration between systems. However, the benefits offered are significant, particularly in increasing transparency and efficiency in hospital administration.

Administrative performance in hospitals

Hospital administrative performance is a crucial indicator reflecting the effectiveness of resource management and non-clinical services. Implementing a Hospital Management Information System (HIMS) plays a significant role in improving this performance, particularly in terms of time efficiency, data accuracy, reduced administrative errors, and operational cost control. Taneja and Singh (2025) demonstrated that implementing a hospital management information system (HIMS) in tertiary institutions can significantly accelerate administrative processes and improve financial efficiency. By automating registration, billing, and reporting processes, hospitals can reduce waiting times and labor costs, as well as increase administrative staff satisfaction.

Patient service quality

The quality of patient care is a key indicator of a hospital's success in providing effective, efficient, and patient-centered care. The implementation of HIMS directly contributes to improving the quality of these services through various mechanisms such as shortened waiting times, increased patient data accuracy, easier access to information, and transparency in the service process. Çetin et al. (2021) demonstrated that implementing an HIMS-based emergency triage information system can accelerate decision-making and significantly reduce patient waiting times. The digital system helps medical staff quickly and accurately identify patient priorities, thereby improving patient safety and satisfaction.

Methods

Study design and protocol

This study employed a Systematic Literature Review (SLR) design following the 2020 PRISMA guidelines to ensure a transparent search and reporting process. The protocol was developed following the PROSPERO format, which includes the objectives, research questions, eligibility criteria, and literature search strategy, in accordance with global HIS review practices (Lei et al., 2021). This review is particularly pertinent given that while Health Information Management System (HIMS) implementation in Indonesia continues to evolve, the existing empirical evidence remains inconclusive (Taneja & Singh, 2025).

Eligibility criteria

This review included studies that evaluated Health Information Management Systems (HIMS)/Health Information Systems (HIS) implementation in hospitals, employing quantitative, qualitative, mixed methods, or pre-post-intervention designs. Conversely, studies focusing solely on technical aspects without assessing administrative performance or patient care quality were excluded. These criteria were rigorously established based on recommendations for relevance assessment within the domain of health information systems research (Avila & Gil, 2025).

Search strategy

A systematic search was conducted in PubMed,

Scopus, ScienceDirect, and Google Scholar for publications from 2010–2025 in English or Indonesian. Keywords included HIMS/HIS, hospital information system, administrative performance, and patient care. The search strategy was developed based on the PRISMA replication principle (Lei et al., 2021). Full details of the strategy are presented in the appendix.

Study selection

All search results were imported into Rayyan for deduplication and screening by two independent reviewers. Disagreements were resolved through discussion or by a third reviewer to maintain reliability, in accordance with selection practices in the HIS SLR (Taneja & Singh, 2025). Only studies that passed full-text review were included in the synthesis.

Data extraction

Extraction was conducted using a standardized form containing author information, year, location, design, measurement method, and outcomes related to administrative performance and patient care quality. Two reviewers independently extracted data to minimize bias, in accordance with the Health Information System SLR guidelines (Hoxha et al., 2022).

Study quality assessment

Methodological quality was assessed using the Newcastle–Ottawa Scale (NOS), which assesses sample selection, comparability, and outcome measurement. The use of the NOS follows the practice of health information technology effectiveness studies to minimize the risk of bias in the interpretation of results (Taneja & Singh, 2025).

Data synthesis

The synthesis was conducted narratively due to the heterogeneity of designs and outcome indicators. Quantitative data such as time efficiency, data accuracy, and patient satisfaction were presented descriptively, while qualitative data were analyzed thematically to map user perceptions, successes, and barriers to implementation. This approach follows recommendations for HIS analysis in developing countries (Kemp et al., 2021; Hoxha et al., 2022).

Result

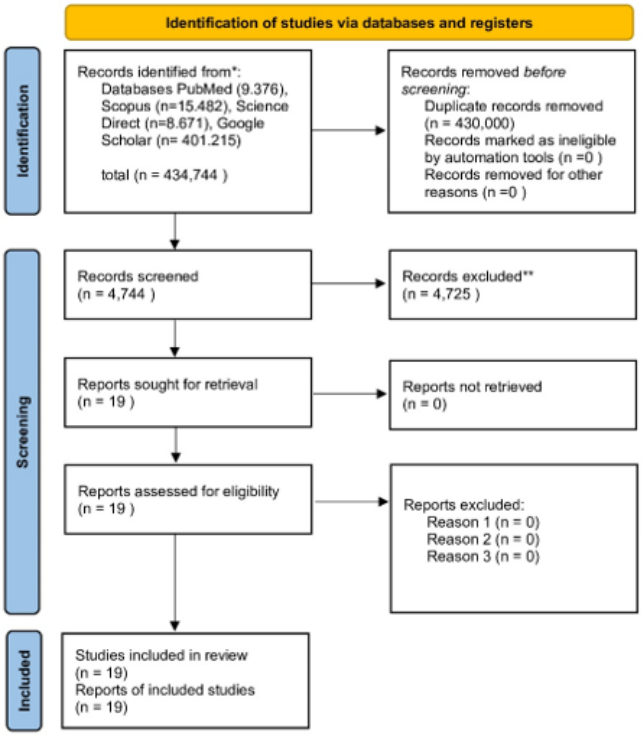

Figure 1. PRISMA flow

The literature searches results for this systematic review on Health Information Management System (HIMS)/Hospital Information System (HIS) implementation demonstrate a selection process that followed PRISMA 2020. During the identification stage, 434,744 records were retrieved from electronic databases using a combination of keywords related to HIMS, HIS, hospital performance, administrative efficiency, and service quality. All data came from online databases, without manual searches or grey literature.

After deduplication, 430,000 records were removed due to duplication, leaving 4,744 unique articles for the title and abstract screening stage. At this stage, 4,725 articles were eliminated for being irrelevant, not focusing on the hospital context, not discussing HIMS/HIS, or not meeting methodological quality standards. A total of 19 articles proceeded to the eligibility assessment stage. All 19 full-text articles were successfully accessed, and after a thorough review, all met the inclusion criteria: empirical research on HIMS/HIS implementation and its

relationship to administrative performance or service quality. No studies were excluded at this stage. The final phase yielded 19 studies included in the qualitative synthesis. Meta-analysis was not performed due to the high heterogeneity of study designs and outcome indicators.

Overall, out of over 400,000 initial records, only 19 studies were eligible for analysis, demonstrating the importance of a rigorous selection process to ensure only relevant and high-quality evidence is used in this review.

Table 1. Included studies

No	Title	Author & Years	Journal	Methods	PICO TAGS	Aims	Key Thematic
1	Impact of hospital size on healthcare information system effectiveness: evidence from healthcare data analytics	Fu, L., Li, L., Zhang, W., & Luo, Z. (2022)	Journal of Management Analytics	Quantitative; multi-hospital secondary data analysis	Health Information System, Healthcare Services Administration	Examine the relationship between hospital size and HIS effectiveness.	Administrative efficiency, system performance
2	Using routine health information systems for well-designed health evaluations in low- and middle-income countries	Wagenaar, B., Sherr, K., Fernandes, Q., & Wagenaar, A. (2016)	Health Policy and Planning	Descriptive; systems and policy analysis	Routine HIS, Healthcare Quality Assessment	Evaluate the use of RHIS to support health policy evaluation.	Data use, system evaluation
3	Improving quality and use of routine health information system data in low- and middle-income countries: A scoping review	Lemma, S. et al. (2020)	PLoS ONE	Scoping review	Routine HIS, Healthcare Quality Assessment	Assess quality improvement strategies and the use of routine information system data.	Data quality, system governance
4	Exploring data quality and use of the routine health information system in Ethiopia: a mixed-methods study	Adane, A. et al. (2021)	BMJ Open	Mixed-methods (survey + interviews)	Routine HIS, Healthcare Services Administration	Assess RHIS data quality and influencing factors.	Data quality, system capacity

5	Data quality assessment and associated factors in the health management information system among health centers of Southern Ethiopia	Solomon, M. et al. (2021)	PLoS ONE	Quantitative; cross-sectional survey	Routine HIS, Healthcare Quality Assessment	Assess HMIS data quality and related factors.	Data quality, reporting efficiency
6	The assessment of routine health information system performance towards improvement of RMNCAH services in Nigeria	Oladoyin, V. et al. (2025)	PLoS ONE	Quantitative; evaluative	Routine HIS, Healthcare Quality Assessment	Evaluate the performance of RHIS in improving the quality of maternal and child health services.	System performance, service quality
7	Healthcare professionals' satisfaction toward the use of district health information system and its associated factors in southwest Ethiopia	Walle, A. et al. (2023)	Frontiers in Digital Health	Quantitative; healthcare worker survey	Health Information System, Patient Satisfaction	Assess healthcare worker satisfaction and factors influencing HIS use.	User satisfaction, success factors
8	Determining the relationship between e-health literacy and personal health system and patient satisfaction	Koca, M., Inceoğlu, F., & Deniz, S. (2025)	BMC Health Services Research	Quantitative; structural equation modeling	Digital Health, Patient Satisfaction	Examine the relationship between digital literacy, personalized health systems, and patient satisfaction.	Digital literacy, patient satisfaction
9	From electronic health records to clinical management systems: how the digital transformation can support healthcare services	Barbieri, C. et al. (2023)	Clinical Kidney Journal	Narrative review	Digital Health, Healthcare Services Administration	Explain the digital transformation from medical records to clinical management systems.	Digital transformation, service efficiency

10	Evaluating EHR-Integrated Digital Technologies for Medication-Related Outcomes and Health Equity in Hospitalised Adults: A Scoping Review	Murthi, S. et al. (2024)	Journal of Medical Systems	Scoping review	Digital Health, Hospitalisation	Evaluate the impact of digital technology integrated with EHRs on treatment outcomes and equity of care.	Integrated technology, health equity
11	Connected Healthcare: Improving Patient Care using Digital Health Technologies	Awad, A. et al. (2021)	Advanced Drug Delivery Reviews	Narrative review	Digital Health, Patient Satisfaction	Examine the role of digital technology in improving patient care.	Digital innovation, service quality
12	Digital Technology and the Future of Health Systems	Mitchell, M., & Kan, L. (2019)	Health Systems & Reform	Conceptual review	Digital Health, Healthcare Services Administration	Analyze the role of digital technology in healthcare system reform.	System transformation, digital policy
13	Assessing healthcare service quality using routinely collected data: Linking information systems in emergency care	Dorman n, H. et al. (2020)	Journal of Medical Systems	Quantitative; routine data analysis	Routine HIS, Healthcare Quality Assessment	Assess the quality of emergency care services through HIS data.	Data integration, service quality assessment
14	Standards, Processes, and Tools Used to Evaluate the Quality of Health Information Systems: Systematic Literature Review	Noël, R., Taramas co, C., & Márquez , G. (2020)	Journal of Medical Internet Research	Systematic review	Health Information System, Healthcare Quality Assessment	Identify standards and tools for assessing HIS quality.	System evaluation, quality standards
15	Understandin g the impacts of health information systems on	Nguyen, Q. et al. (2022)	PLoS ONE	Systematic review	Health Information System, Hospitalisation	Examine the impact of HIS on patient flow management in hospitals.	Service efficiency, patient flow

	patient flow management: A systematic review						
16	Visualizing Benefits: Evaluating Healthcare Information System Using IS-Impact Model	Davidson, B. et al. (2020)	IEEE Access	Quantitative; IS-Impact Model	Health Information System, Healthcare Services Administration	Evaluate the benefits of HIS on hospital performance.	HIS performance, administrative impact
17	Role of perceived ease of use, usefulness, and financial strength on the adoption of health information systems	Luo, J. et al. (2024)	Humanities and Social Sciences Communications	Quantitative; Technology Acceptance Model (TAM)	Health Information System, Healthcare Services Administration	Assess factors influencing HIS adoption in hospitals.	Adoption factors, implementation success
18	The Impact of Digital Hospitals on Patient and Clinician Experience: Systematic Review and Qualitative Evidence Synthesis	Canfell, O. et al. (2024)	Journal of Medical Internet Research	Systematic review & qualitative synthesis	Digital Health, Patient Satisfaction, Hospitalisation	Examine the impact of digital hospitals on patient and clinician experiences.	User experience, service quality
19	Digital health and quality of care in Primary Health Care: an evaluation model	De Siqueira Silva, Í. et al. (2024)	Frontiers in Public Health	Empirical evaluation model	Digital Health, Healthcare Quality Assessment	Develop an evaluation model to assess the impact of digital health on the quality of primary care.	Evaluation model, service quality

Based on table above, studies show that HIS/HIMS generally improve administrative efficiency, data quality, and user satisfaction, primarily through information integration and service process improvements (Fu et al., 2022). However, most studies used cross-sectional designs, thus hindering the ability to more robustly assess causal relationships (Walle et al., 2023).

Studies on RHIS confirm that data quality is strongly influenced by organizational factors and user competency, with strengths in large sample sizes but limited study coverage (Lemma et al., 2020). Another limitation is the lack of comparative study of system variations between facilities (Adane et al., 2021).

Research on digital literacy and satisfaction suggests that user competency determines HIS effectiveness, although most studies focus on perceptions, leaving the operational impact at the organizational level unclear (Koca et al., 2025). Studies on digital transformation also highlight service efficiency, but most are narrative-based reviews without robust quantitative evidence (Barbieri et al., 2023).

Several publications have used evaluation models such as TAM and IS-Impact and found consistent evidence regarding system acceptance factors, but these models have not been widely tested across hospital types, particularly in Southeast Asia (Luo et al., 2024). Overall, the quality of the publications is quite good, but heterogeneity in methods and the lack of longitudinal studies remain major obstacles to concluding comprehensive conclusions about the effectiveness of HIS/HIMS (Murthi et al., 2024).

Discussion

The review results indicate that the implementation of a Health Information Management System (HIMS) or Hospital Information System (HIS) significantly improves hospital administrative performance. Various studies confirm that digitizing administrative processes can accelerate reporting, improve data accuracy, and consistently reduce staff workload across various hospital types (Davidson et al., 2020). These findings are reinforced by studies on patient flow management, which show that HIS improve the smoothness of processes from registration to service delivery, thereby increasing overall operational efficiency (Nguyen et al., 2022). Empirical evidence also indicates that implementation success is higher in hospitals with strong financial and infrastructure readiness (Luo et al., 2024), demonstrating the influence of organizational factors on HIMS effectiveness.

Data quality has emerged as a key indicator in assessing HIMS success. Research in Ethiopia confirms that the completeness, timeliness, and accuracy of data in a Routine Health Information System (RHIS) directly improves the effectiveness of management planning and decision-making (Adane et al., 2021). Other studies have shown that good data quality can only be achieved through staff training and effective information governance (Solomon et al., 2021). Therefore, HIMS implementation depends not only on technological tools but also on the ability of human resources to manage data. This evidence is relatively strong because it consistently emerges across various developing countries, although most studies are cross-sectional, limiting causal analysis.

Improved patient care quality is also a key outcome of HIMS implementation. Electronic medical record systems and digital integration have been shown to strengthen clinical coordination, reduce the risk of medical errors, and expedite the diagnostic process (Barbieri et al., 2023). Technology connected to EHRs also improves equity of care through broader access to clinical information (Murthi et al., 2024). Regarding patient satisfaction, digital literacy has been shown to be a crucial factor, with patients who are able to use digital platforms experiencing more transparent and responsive services (Koca et al., 2025). Research on digital experiences in hospitals also shows that digitalization reduces the administrative burden on healthcare workers, increasing their focus on direct care (Canfell et al., 2024). The consistency of findings across studies indicates relatively good evidence strength, although longitudinal research is needed to assess long-term effects.

The success of HIMS implementation is influenced by human, organizational, and policy factors. Research indicates that institutional capacity, leadership support, and ongoing training are key prerequisites for system effectiveness (Oladoyin et al., 2025). Furthermore, perceived ease of use, system reliability, and adequate technical support are also determinants of user satisfaction and acceptance (Walle et al., 2023). The lack of HIMS quality evaluation standards also poses a barrier, as many hospitals implement the system without a clear evaluation framework (Noël et al., 2020). Furthermore, a culture of data utilization needs to be strengthened to ensure that system-generated data is effectively used in decision-making (De Siqueira Silva et al., 2024). In general, the most common inhibiting factors identified are budget constraints, user resistance, lack of training, and minimal system integration.

The main strength of the available evidence is the consistency of results across countries and study designs that indicate a uniform direction of impact, namely that HIMS improves administrative efficiency and service quality. However, most studies used cross-sectional designs, thus limiting conclusions regarding causal relationships (Solomon et al., 2021; Adane et al., 2021). Furthermore, variations in hospital contexts lead to heterogeneity in findings, requiring interpretation of results to consider local conditions. The lack of HIS evaluation standards also significantly limits comparisons between studies (Noël et al., 2020).

The general interpretation of these findings suggests that HIMS is not simply a technological tool, but a managerial intervention that requires organizational readiness, a data culture, and long-term commitment to maximize its benefits. Successful implementation requires alignment between technology, human capacity, work processes, and policy support. HIMS has great potential to improve hospital efficiency and service quality, but optimal benefits are only achieved when human and organizational factors are well managed (Luo et al., 2024).

Implications for future research include the need for longitudinal studies and standardized model-based evaluations to assess long-term effectiveness, particularly regarding system integration, clinical impact, and the cost-benefit of HIMS implementation. Furthermore, further research is needed to understand how patient digital literacy and healthcare workforce capacity influence system success at various levels of the hospital. Mixed-methods research can also enhance understanding of implementation barriers and the dynamics of organizational change in the context of healthcare digitalization.

Limitations and future research

This study has several limitations that should be considered. The number of studies reviewed was only 19, and they were predominantly from developing countries, so the results do not fully reflect the situation in developed countries. The majority of studies also used qualitative or mixed methods, so quantitative evidence regarding the direct impact of HIMS on administrative performance and service quality remains limited. Differences in definitions, performance indicators, and implementation stages across studies also complicate comparisons. Furthermore, socio-cultural aspects of HIMS use have not been extensively studied.

Based on these limitations, future research should employ stronger quantitative designs, incorporate longitudinal data, and compare different hospital and country contexts. Future studies should also highlight user experience and the integration of new technologies such as artificial intelligence, as well as consider policy, data security, and ethical aspects to strengthen the sustainability of HIMS implementation.

Conclusion

Based on a systematic review HIMS implementation has been proven to improve hospital administrative performance by accelerating data processing, reducing recording errors, and increasing the efficiency of managerial processes. These findings demonstrate that information digitization is a crucial element in optimizing administrative governance.

HIMS also positively impacts the quality of patient care by strengthening service coordination, accelerating response times, and improving patient safety and satisfaction. The digital system enables healthcare professionals to provide more standardized, accurate, and patient-centered services.

The success of HIMS implementation is determined by management support, human resource competency, infrastructure readiness, and user perceptions of the system's ease of use and benefits. Conversely, resistance to change, budget constraints, and lack of training are key factors hindering effective HIMS implementation.

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