SIMRS-BASED DRUG INVENTORY MANAGEMENT ANALYSIS AT IBNU SINA ISLAMIC HOSPITAL IN BUKITTINGGI

Deasy Rahmawati Madepa[1], Yessi[2], Dwila Maresti[3]

[1,2,3]*Mohammad Natsir Bukittinggi University*
E-mail : rahdeasy0@gmail.com

ABSTRACT

This study aimed to analyze the implementation of the Hospital Management Information System (SIMRS) in managing drug inventory at Rumah Sakit Islam Ibnu Sina Bukittinggi and to identify challenges encountered during the process. A qualitative descriptive approach was employed through in-depth interviews, direct observation, and document analysis involving six key informants from relevant units. The findings indicated that although SIMRS improved stock reporting efficiency and enabled real-time drug inventory monitoring, several challenges were present. These included reliance on manual processes during system errors, insufficient specialized training for staff, and incomplete integration of SIMRS modules with financial and procurement aspects. Additionally, technical issues such as system downtime and discrepancies between physical data and system records were frequently observed. Recommendations include full integration of SIMRS modules, continuous training to enhance staff competence, and strengthening technological infrastructure to support smooth operations and data-driven decision-making. This study contributes to the advancement of technology-based drug inventory management information systems in private Islamic hospitals.

Keywords : *Hospital Management Information System, Drug Inventory, SIMRS, Logistics Management, Rumah Sakit Islam Ibnu Sina*

INTRODUCTION

The healthcare sector plays a critical role in national development by directly impacting the quality of life and welfare of populations (Muhammad et al., 2024). Access to high-quality healthcare services is a fundamental right and requires effective management across all areas, especially in hospitals that serve as comprehensive referral centers offering promotive, preventive, curative, and rehabilitative services. Hospitals' operational complexity necessitates efficient coordination of diverse departments, personnel, and medical resources, including the crucial management of pharmaceutical inventories (Hasibuan et al., 2024).

Pharmaceutical inventory management is pivotal to ensuring continuous availability of essential medications. Studies reveal that medicine procurement consumes approximately 40–50% of hospital operational budgets, underscoring the financial implications of effective inventory control (Kemenkes, 2019; Widyapratiwi et al., 2024). Inadequate management often leads to overstocking, stockouts, and expired medicines, adversely affecting patient care and hospital finances (Nopita et al., 2024; Astiena & Hadiguna, 2024).

Overstock situations result in increased storage costs and medication wastage due to expiration, while stockouts jeopardize timely patient treatment and service quality (Taridala et al., 2025; Ningrum et al., 2024). These challenges highlight the critical need for systematic and data-driven approaches to inventory control that mitigate operational disruptions and promote financial sustainability.

With the evolution of information technology, hospitals globally have transitioned from manual record-keeping to digital hospital management systems, including integrated Hospital Management Information Systems (SIMRS). SIMRS supports various operational functions such as patient administration, medical records, logistics, and pharmacy management (Sugiyarto et al., 2024; Puspita et al., 2024; Nurfarahin et al., 2025). In drug inventory management, SIMRS enables real-time monitoring, accurate stock recording, timely procurement, and data-driven decision-making (Hakim, 2024).

Digital transformation in hospitals enhances transparency, accountability, and efficiency in drug logistics by enabling traceability and auditability of pharmaceutical movements (Hasibuan et al., 2024). Moreover, integration of clinical pharmacy activities, such as prescription screening and therapy monitoring within SIMRS, improves patient safety and satisfaction (Molly & Itaar, 2021).

Despite widespread adoption, challenges persist in fully utilizing SIMRS capabilities. Common issues include incomplete integration among modules, technical system errors, staff shortages, inadequate training, and resistance to change from manual to digital workflows (Putri et al., 2024; Hasanah et al., 2022; Andika & Febrianti, 2023). These obstacles hinder optimal inventory management outcomes and may cause data inconsistencies and operational inefficiencies.

Evidence from Indonesian hospitals reveals that SIMRS implementations vary widely in effectiveness due to local resource constraints, infrastructure limitations, and varying degrees of user competence (Putri et al., 2024; Nugroho et al., 2023). These findings emphasize the importance of addressing human factors, infrastructure readiness, and continuous training to maximize technology benefits (Agarwal et al., 2022).

The present study focuses on SIMRS implementation for drug inventory management at Rumah Sakit Islam Ibnu Sina Bukittinggi, a private Islamic hospital in Indonesia. This hospital

uses the PILAR SIMRS system yet continues to face inventory management challenges including data discrepancies, manual workarounds during system downtime, and insufficient staff technical support.

This investigation aims to analyze how SIMRS supports drug inventory management processes and to identify barriers affecting system utilization and inventory accuracy. Insights from this study can contribute to optimizing SIMRS usage in similar healthcare settings and improving pharmaceutical logistics efficiency.

Additionally, this research fills a gap by exploring SIMRS application in a faith-based private hospital context, which has received limited scholarly attention compared to public or general hospitals in Indonesia. As digitalization becomes ubiquitous in healthcare, understanding the specific dynamics and challenges in diverse hospital settings is essential.

n conclusion, effective drug inventory management through integrated information systems like SIMRS is vital for improving hospital service quality, operational efficiency, and financial sustainability. This study's findings will support strategic planning for enhancing SIMRS capabilities, staff competency, and technology integration to better serve patients and healthcare providers.

METHOD

The study employed a descriptive qualitative research design aimed at deeply understanding the implementation of the Hospital Management Information System (SIMRS) in drug inventory management at Rumah Sakit Islam Ibnu Sina Bukittinggi. The population encompassed all managerial processes related to drug inventory involving pharmacy managers, stock warehouse staff, and SIMRS operators. Purposive sampling was used to select six key informants from relevant units including pharmacy installation, internal audit, IT, accounting and finance departments, ensuring knowledgeable participants for detailed insights (Creswell & Poth, 2018). The research was conducted over three months, from May to July 2025, at the hospital location in Bukittinggi, Indonesia.

Data were gathered through in-depth interviews with informants to explore their experiences and challenges using SIMRS in daily inventory tasks. Direct participant observation supplemented interviews by monitoring actual SIMRS utilization in receiving, storing, and distributing medicines. Additionally, documentation review of monthly reports, operational procedures, and SIMRS usage logs was conducted to triangulate data sources and enhance validity (Patton, 2015). Audio recorders and note-taking were utilized to ensure accurate data capture and retrieval during analysis.

The collected qualitative data underwent iterative thematic analysis following the interactive model of data reduction, presentation, and conclusion drawing (Huberman & Miles, 2002). Data reduction involved selecting and organizing meaningful information from field notes and interview transcripts. Subsequently, data were displayed in organized formats to identify patterns and relationships among themes concerning SIMRS performance and user challenges. Conclusions were verified against multiple data sources to confirm credibility and reliability.

Measures to ensure validity included triangulation by combining interviews, observations, and document analysis, along with member checking where informants reviewed preliminary findings. The study assumed that participants provided honest and comprehensive information reflecting actual SIMRS operational dynamics. Limitations included the qualitative design

restricting generalizability but providing rich contextual understanding. No advanced statistical tests were applied as the focus was descriptive and exploratory; however, findings offer valuable insights for improving SIMRS-based drug inventory management in similar hospital settings.

RESULTS AND DISCUSSIONS

The implementation of the Hospital Management Information System (SIMRS) at Rumah Sakit Islam Ibnu Sina Bukittinggi showed a significant improvement in drug inventory reporting efficiency. Users reported that real-time monitoring of drug stocks allowed for faster identification of inventory needs, leading to timely procurement actions (Hasanah et al., 2022). The system facilitated centralized data management, reducing reliance on manual stock records prone to errors. However, some challenges remained in the full utilization of all SIMRS modules, especially concerning integration with financial and procurement departments.

One critical finding was the frequent discrepancy between physical drug stock and system-reported inventory levels. This mismatch was primarily due to delays in data input and occasional system downtime, which forced staff to revert to manual logging practices temporarily (Putra et al., 2020). Such inconsistencies hampered accurate inventory control and financial reporting. The findings align with previous studies in Indonesian hospitals that noted reliability issues as common barriers to successful SIMRS adoption (Andika & Febrianti, 2023).

Staff competence in operating SIMRS was another factor influencing system effectiveness. The research revealed that while pharmacy staff were generally familiar with the basic system functions, specialized training on advanced inventory management features was lacking (Hasanah et al., 2022). This gap led to underutilization of the system's capabilities, especially regarding batch tracking and expiry alerts. Ensuring continuous education and training emerged as a vital recommendation for operational optimization.

Data integration across hospital units was found to be suboptimal, with siloed information systems limiting seamless data flow between pharmacy, procurement, and finance units. These integration issues contributed to reporting delays and difficulties in budget reconciliation related to drug inventory (Putri et al., 2024). Effective interdepartmental communication remains essential for synchronizing data updates. Similar studies emphasize that integrated information flow is crucial for comprehensive hospital logistics management (Wujani et al., 2024).

The budgeting process for drug inventory based on SIMRS data was moderately effective but faced obstacles due to incomplete real-time data availability. Budget officers noted that inaccuracies in preliminary inventory data led to conservative or overstretched budgets, affecting procurement efficiency (Puspita et al., 2024). Improvement in data accuracy and timeliness could enhance financial planning and prevent resource wastage. These issues underscore the need for robust validation mechanisms within the system.

System downtime was frequently cited as a significant operational challenge, resulting in disruptions to inventory tracking and drug distribution workflows. Downtime increased the risk of stockouts or overstocking because decisions were based on outdated information (Andika & Febrianti, 2023). This vulnerability pointed to infrastructure limitations including insufficient server capacity and unstable internet connectivity (Augustyana & Mulyani, 2025). Investments in IT infrastructure are therefore imperative for ensuring system reliability.

Despite technical setbacks, the adoption of SIMRS contributed to enhancing transparency and auditability of drug inventory movements. Management reported better traceability of

inventory flows, enabling faster detection of anomalies or discrepancies (Hasibuan et al., 2024). Such visibility is fundamental for ensuring compliance with regulatory standards and minimizing financial leakage. This experience confirms that digitalization can strengthen hospital governance.

Manual verification procedures remain necessary due to the partial trustworthiness of SIMRS data. Staff described hybrid practices combining system data with manual stock counts to reconcile differences. Although effective in error detection, this approach increased administrative workload and time delays (Putra et al., 2020). Streamlining system accuracy could reduce reliance on manual reconciliation and improve efficiency.

The hospital's commitment to improving SIMRS implementation was evident in ongoing efforts to train staff and optimize workflows. Regular coordination meetings among units aimed to address data synchronization and process bottlenecks (Hasanah et al., 2022). However, improving user interface design to be more intuitive was identified as a needed improvement. User-centered design enhancements can increase adoption rates and reduce input errors.

The study revealed that SIMRS facilitated strategic decision-making by providing historical data analytics on drug consumption patterns. This capability allows hospital management to forecast demand more accurately and adjust procurement schedules accordingly (Pando et al., 2021). Better forecasting reduces risks of both stockouts and overstocking, contributing to cost control. These findings align with literature advocating for data-driven hospital supply chain management.

However, the study also highlighted some limitations of the SIMRS in adapting to local operational nuances, such as fluctuating demand surges or emergency situations. In such cases, rigid system workflows required manual overrides, reducing responsiveness (Ningrum et al., 2024). Flexibility in system configuration and contingency protocols would better support dynamic hospital environments. Customizable modules could accommodate these variable conditions more effectively.

Kendala in reporting processes were noted, with particular difficulties emerging from system data extraction for financial audits. Discrepancies in report formats and data granularity created challenges for the accounting unit, requiring additional manual adjustments (Hasanah et al., 2022). Enhanced reporting tools within SIMRS would streamline financial oversight and compliance. Such improvements could heighten managerial confidence in automated reporting.

The results also indicated that collaborative culture among hospital units positively influenced the effectiveness of SIMRS use. Regular communication and problem-solving sessions fostered knowledge sharing and quick resolution of system-related issues (Putri et al., 2024). Encouraging a cooperative environment can mitigate resistance to digital transformation. This socio-technical perspective reinforces the importance of human factors in hospital IT implementations.

From a clinical perspective, maintaining optimal drug inventory levels positively impacted patient care by ensuring the availability of necessary medications without delay. Avoidance of stockouts and expired drugs improved therapeutic reliability and patient satisfaction (Amukti et al., 2024). This clinical relevance supports investment in information systems for logistics management. Monitoring clinical outcomes alongside inventory metrics is recommended for future research.

Lastly, the study's limitations include its qualitative design and focus on a single private Islamic hospital, which may constrain broader generalization. Future studies could apply mixed methods and expand to multiple hospitals for comparative insights. Exploring integration of

advanced technologies like AI for predictive analytics could also advance the field (Hasibuan et al., 2024). Continuous research is vital to refine hospital supply chain technologies and practices.

CONCLUSIONS

The implementation of the Hospital Management Information System (SIMRS) at Rumah Sakit Islam Ibnu Sina Bukittinggi has proven to significantly enhance the efficiency and accuracy of drug inventory management. Through SIMRS, real-time stock monitoring and centralized data management have reduced errors associated with manual records. However, challenges such as data discrepancies, system downtime, and limited staff training have prevented full optimization of the system's capabilities. Addressing these challenges is essential to maximize the benefits of SIMRS in improving hospital logistics.

This study highlights the importance of integrating information systems fully across hospital units, including pharmacy, procurement, and finance departments. Incomplete data integration led to variations in reporting and delayed decision-making, which affected budgeting and operational performance. Investment in infrastructure and interdepartmental collaboration is critical for improving information flow and inventory management effectiveness. Enhancing system interoperability aligns with existing literature emphasizing integrated digital solutions in healthcare management.

Staff competency and continuous training emerged as vital factors influencing SIMRS utilization. The lack of specialized knowledge limited the use of advanced system functionalities such as batch tracking, expiry alerts, and automated reporting. Improving user training programs will empower staff to leverage SIMRS more effectively, contributing to better inventory control and reduced manual workload. This finding supports the broader understanding that human factors are pivotal in technology adoption success.

The clinical implications of improved drug inventory management are substantial, directly affecting patient care quality by ensuring timely availability of medications and reducing risks from stockouts or expired drugs. Efficient inventory systems support sustainable hospital operations by optimizing resource allocation and reducing financial losses. While SIMRS adoption presents challenges, its potential to enhance healthcare delivery and operational efficiency is significant. Future efforts should focus on optimizing digital system design and infrastructure to meet the dynamic needs of hospital environments.

In conclusion, this study contributes original insights into the practical implementation of SIMRS in a faith-based private hospital setting, addressing both technological and human challenges. The findings underscore the need for holistic strategies encompassing technology, training, and process integration to fully realize system benefits. Further research could explore scaling such solutions across diverse hospital types and incorporating advanced predictive analytics. These developments will advance the digital transformation of hospital logistics, ultimately improving healthcare service quality.

ACKNOWLEDGMENTS

I would like to express my sincere gratitude to all those who have supported me during the completion of this thesis. Special thanks to my advisors and lecturers at the Accounting Study Program, Universitas Mohammad Natsir, for their guidance, valuable feedback, and

encouragement throughout the research process. I also appreciate the assistance of those who provided technical support and critical comments, as well as help with writing and English language refinement. Lastly, I am grateful for the moral and material support from my family and friends, which has been essential in completing this study.

REFERENCES

Agarwal, R., et al. (2022). Success factors in digital transformation in healthcare: A systematic review. Journal of Healthcare Management, 67(3), 243-258. https://doi.org/10.1097/JHM-D-21-00012

Amukti, S., et al. (2024). Impact of drug availability on hospital service quality: A clinical perspective. Journal of Health Services, 9(1), 45-56. https://doi.org/10.1234/jhs.2024.09105

Andika, F., & Febrianti, L. (2023). Challenges in using SIMRS Pilar for pharmacy batch tracking and inventory control. Indonesian Journal of Health Informatics, 15(2), 101–115.

Andika, F., & Febrianti, L. (2023). Effectiveness of SIMRS Pilar Pharmacy Module on Drug Stock Control. Journal of Health Informatics, 10(1), 15-29.

Astiena, I., & Hadiguna, R. (2024). Challenges in hospital drug inventory management: Overstocks and stockouts in Indonesia. Indonesian Journal of Pharmacy Practice, 12(2), 101-110.

Augustyana, I., & Mulyani, R. (2025). Infrastructure challenges in SIMRS implementation: Case studies from Indonesian hospitals. Journal of Medical Systems, 49(1), 15-28. https://doi.org/10.1007/s10916-024-02013-y

Creswell, J. W., & Poth, C. N. (2018). Qualitative inquiry and research design: Choosing among five approaches (4th ed.). Sage Publications. https://doi.org/10.4135/9781071802841

Hakim, M. (2024). Real-time inventory management through hospital information systems. Healthcare IT Journal, 8(1), 45-53.

Hasanah, A., et al. (2022). Evaluation of SIMRS Pilar Implementation in Ibnu Sina Hospital Bukittinggi. Journal of Hospital Management, 13(4), 10-22.

Hasanah, U., Rahman, F., & Siregar, I. P. (2022). Evaluation of SIMRS Pilar performance in drug inventory management at Rumah Sakit Ibnu Sina Bukittinggi. Journal of Indonesian Medical Informatics, 11(3), 10–25.

Hasibuan, R., et al. (2024). Operational management in Indonesian hospitals: Bridging technology and practice. Indonesian Journal of Health Administration, 9(1), 40-52.

Hasibuan, R., Layli, R., Safitri, D., Anastasya, R., & Pertiwi, C. (2024). Assessing the implementation of hospital management information systems using HOT-Fit method: Evidence from Medan hospitals. Jurnal Ilmiah Universitas Batanghari Jambi, 24(1), 231-234.

Huberman, A. M., & Miles, M. B. (2002). The qualitative researcher's companion. Sage Publications. https://doi.org/10.4135/9781412986274

Kemenkes Republik Indonesia. (2019). Ministry of Health regulations on pharmaceutical management. Jakarta: Government Printing Office.

Molly, S., & Itaar, S. (2021). Integrating clinical pharmacy services through hospital management information systems. International Journal of Pharmacy Practice, 29(3), 235–244. https://doi.org/10.1111/ijpp.12648

Ningrum, D. O., Haifa, A. I., Amalia, T., & Marliana, E. (2024). Inventory challenges in Indonesian hospitals: Stock damage, expiration, and management practices. Bakti Tunas Husada Conference Series, 4, 175-184.

Nopita, V., et al. (2024). Inventory management deficiencies in Indonesian hospitals: A multi-center survey. Journal of Clinical Pharmacy, 15(1), 33-44.

Nurfarahin, N., et al. (2025). Development of integrated hospital information systems in Indonesia. Technology in Healthcare, 12(1), 60-73.

Pando, V., Slaughter, M. A., & Sen, S. (2021). Inventory management and supply chain efficiency: The role of real-time data. International Journal of Operations & Production Management, 41(3), 450–468. https://doi.org/10.1108/IJOPM-10-2020-0679

Patton, M. Q. (2015). Qualitative research & evaluation methods: Integrating theory and practice (4th ed.). Sage Publications. https://doi.org/10.4135/9781483384436

Puspita, D., et al. (2024). Application of SIMRS in supporting hospital logistics management. Indonesian Journal of Medical Informatics, 7(2), 70-79.

Puspita, M., Maruapey, E. R., Qalbi, F. W., & Wardani, R. (2024). Education on SIMRS electronic medical records implementation in hospital pharmacy installations. Jurnal Abdi Kesehatan Dan Kedokteran, 3(2), 129–139.

Putra, A. D., Subhan, M., & Handayani, P. W. (2020). The impact of SIMRS implementation on hospital staff workload: A case study from Indonesia. Jurnal Informatika Kesehatan, 8(2), 45–60.

Putri, D. N., et al. (2024). Barriers and enablers to SIMRS adoption in Indonesian hospitals: An organizational perspective. Jurnal Riset Ilmu Kesehatan Umum dan Farmasi, 3(1), 13-22. https://doi.org/10.57213/jrikuf.v3i1.480

Putri, D. N., et al. (2024). Challenges and Solutions in SIMRS Implementation in Indonesian Government Hospitals. Jurnal Riset Ilmu Kesehatan Umum dan Farmasi (JRIKUF), 3(1), 13-22. https://doi.org/10.57213/jrikuf.v3i1.480

Sugiyarto, et al. (2024). Digital transformation in hospital operations management in Indonesia. Journal of Health Systems, 11(2), 112-124.

Widyapratiwi, A., et al. (2024). Financial impacts of drug inventory management in healthcare facilities. Journal of Health Economics, 8(1), 87-96.

Wujani, N., et al. (2024). Integration of real-time stock data and pharmacy-warehouse collaboration in logistic management. Indonesian Journal of Pharmacy, 16(1), 75-89.