JRAPIK
VOL. 6 NO. 1 TAHUN 2026
Publishing
Jurnal Ranah Publik Indonesia Kontemporer
https://rapik.pubmedia.id/index.php/rapik

Internal Control Analysis of Hospital Logistics to Support Operational Efficiency at UGM Academic Hospital

Suradi[1*)], Erni Saharuddin[2]

[1]Fakultas Ekonomi Ilmu Sosial dan Humaniora, Universitas 'Aisyiyah Yogyakarta, Jl. Siliwangi (Ring Road Barat) No. 63, Nogotirto, Gamping, Sleman, Yogyakarta 55292
Email: [1]administrasipublik@unisayogya.ac.id

ARTICLE INFO

Article history:
Send 19/06/2026
Received 01/07/2026
Accepted 05/07/2026

Abstract

Hospital logistics management plays an important role in supporting healthcare services and operational efficiency. Ineffective internal control may lead to inventory discrepancies, procurement delays, and inefficient use of supplies. This study aims to analyze the internal control of housekeeping supply management at UGM Academic Hospital based on the COSO framework and to identify challenges in its implementation. The study applies the COSO framework to housekeeping supply management in a hospital setting and provides empirical evidence on how its components support effective inventory management. A qualitative research approach was employed, with data collected through interviews, observations, and document analysis involving administrative staff, warehouse personnel, procurement officers, and representatives from service units. Data were analyzed using the five components of the COSO internal control framework: control environment, risk assessment, control activities, information and communication, and monitoring activities. The findings indicate that internal control has been implemented through planning, procurement, storage, distribution, and inventory monitoring. However, several challenges remain, including inventory counting that is not integrated with service units, procurement delays, off-system supply requests, and discrepancies between inventory records and actual stock levels. Strengthening an integrated inventory system, enhancing procurement evaluation, and conducting regular inventory monitoring are recommended to improve the effectiveness of internal control and hospital operational efficiency.

Keywords: *inventory management, hospital logistics, internal control system*

INTRODUCTION

Healthcare services are an essential component of national development because they are directly associated with maintaining and improving public health. Healthcare services are not limited to curative care but also encompass promotive, preventive, rehabilitative, and palliative services that are delivered in an

integrated manner through healthcare facilities, including hospitals. (Pemerintah Indonesia, 2023)

Hospitals play a strategic role in providing comprehensive individual healthcare services, including inpatient, outpatient, and emergency care. To effectively fulfill these functions, hospitals require adequate resources to ensure that healthcare services are delivered efficiently, effectively, and sustainably. (Pemerintah Indonesia, 2021) In addition to medical personnel, hospitals require adequate support from hospital logistics management, particularly the management of non-medical logistics. Hospital logistics include operational supplies such as cleaning materials, office supplies, consumables, and other supporting equipment. Although these items are non-medical in nature, their availability is essential for ensuring uninterrupted healthcare services, maintaining patient comfort, and improving the efficiency of both clinical and administrative operations. (Prana Iswari et al., 2022)

One of the major challenges in hospital logistics management is the absence of effective planning and internal control systems, which may result in inaccurate procurement, budget inefficiencies, and delays in the distribution of logistics supplies. Weak internal controls may lead to organizational inefficiency because available resources are not utilized optimally. In hospitals, such conditions may directly affect the continuity of healthcare services and disrupt the operational performance of hospital departments. (Dharmmesta & Handoko, 2018). Internal control is a mechanism employed by organizations to minimize the risks of errors, fraud, and misuse in operational activities. The concept originated from the definition introduced by the American Institute of Certified Public Accountants (AICPA) in 1963, which emphasized the importance of segregation of duties, separation of responsibilities, and verification procedures as preventive measures against irregularities. (Lee et al., 2021)

Within hospital organizations, effective hospital logistics management cannot be separated from the implementation of a robust internal control system. The Committee of Sponsoring Organizations of the Treadway Commission (COSO) defines internal control as a process designed and implemented by the board of directors, management, and all organizational personnel to provide reasonable assurance regarding the achievement of organizational objectives, including operational effectiveness and efficiency, reliable reporting, and compliance with applicable laws and regulations. The COSO framework consists of five interrelated components: the control environment, risk assessment, control activities, information and communication, and monitoring. The integrated implementation of these five components is highly relevant to ensuring that hospital logistics are managed in an orderly, transparent, and efficient manner. (COSO, 2013)

The COSO framework is one of the most widely adopted models for internal control in internal auditing, risk management, and organizational reporting. Its flexibility enables organizations across various sectors to evaluate and improve the effectiveness of their internal control systems. Despite certain limitations, the COSO framework remains an important reference for developing effective internal control practices. (Adeboye et al., 2021) Numerous studies have examined internal control systems in inventory management and logistics. Kawatu (2020) reported that the internal control system for merchandise inventory operated effectively based on the COSO components, although weaknesses remained in the monitoring function. Ratiani & Masdiantini (2022) found that the implementation of COSO-based internal control complied with most COSO components and supported effective inventory

management. Similar findings were reported by Anisa (2023), who concluded that the inventory internal control system generally conformed to the COSO framework despite deficiencies in organizational structure.

Meanwhile, Febriani (2024) identified several weaknesses in inventory internal control, including the absence of a code of ethics, an audit committee, and adequate monitoring mechanisms. In the healthcare sector, Rahmatullah (2020) found that non-medical hospital logistics management performed well in planning and maintenance functions but continued to face challenges in procurement and asset disposal. Tampubolon (2025) further demonstrated that non-medical logistics planning had not been fully standardized and was still influenced by human resources, procedures, methods, and budgetary constraints. In addition, Nona (2025) concluded that effective inventory management plays an important role in improving organizational financial efficiency.

Nevertheless, previous studies have several limitations. Most research has focused on internal control systems for commercial inventory in private-sector organizations or on hospital logistics management in general, providing limited evidence regarding the implementation of internal control in managing non-medical hospital logistics, which are characterized by routine consumption, high usage volumes, and involvement of multiple service units. Furthermore, previous studies have generally evaluated the effectiveness of internal control without explicitly examining its contribution to hospital operational efficiency, particularly in teaching hospitals that simultaneously perform healthcare, education, and research functions. These limitations indicate a research gap concerning the implementation of the COSO framework in hospital logistics management as a key factor supporting operational efficiency. This study is particularly important because hospital logistics management represents a routine operational activity involving substantial financial resources. Ineffective internal control in logistics management may result in unnecessary expenditures, inventory discrepancies, and disruptions to healthcare service continuity. The importance of this issue is even greater in teaching hospitals, which are required to maintain a balance between service quality, operational efficiency, and accountability in resource management while adapting to increasing demands for financial independence.

UGM Academic Hospital is a teaching hospital that serves as a strategic center for healthcare services, education, and research. Since commencing operations in March 2012, UGM Academic Hospital had been funded through the Universitas Gadjah Mada Annual Work Plan and Budget (RKAT UGM) until 2023. In line with the university's policy to strengthen the autonomy of its strategic units, UGM Academic Hospital was designated as a special unit with independent financial management in 2024. Beginning in 2025, UGM Academic Hospital has operated with full financial independence and no longer relies on funding from RKAT UGM. This transition reflects the university's commitment to promoting autonomous, sustainable, and accountable governance while presenting new challenges for UGM Academic Hospital in maintaining service continuity, operational efficiency, and continuous quality improvement.

Based on data from UGM Academic Hospital logistics distribution system covering the period from January 1, 2020, to December 31, 2024, several categories of non-medical logistics supplies accounted for the highest levels of consumption. The most frequently used items included hand towel tissue, A4 paper, plastic clip bags, handwash refill, and AA batteries. The consistently high consumption of these items indicates repetitive demand patterns that may lead to operational inefficiencies if not supported by effective planning and internal control systems. These findings

highlight the importance of implementing a structured, systematic, and data-driven internal control mechanism for hospital logistics management to improve the operational efficiency of UGM Academic Hospital. The distribution of non-medical logistics supplies from 2020 to 2024 is presented in Table 1.

Table 1. Distribution of Non-Medical Logistics Supplies 2020–2024

No	Item	Quantity	Unit	Price	Total Cost
1	Plastic Clip Bags	30.355	pcs	Rp 3.295,86	Rp 100.045.996,50
2	AA Batteries	21.798	pcs	Rp 5.799,17	Rp 126.410.426,20
3	Handwash Reffil	14.236	pcs	Rp 15.091.46	Rp 214.842.100,00
4	A4 Copy Paper	13.231	packs	Rp 42.131,68	Rp 558.105.940,00
5	Hand towel Tissue	98.026	packs	Rp 6.633,74	Rp 650.279.282,00

Source : Secondary Data from UGM Academic Hospital, 2025

Based on the foregoing discussion, this study aims to analyze the implementation of the internal control system for hospital logistics management at UGM Academic Hospital using the five components of the COSO framework and to identify the challenges encountered during its implementation. The study focuses on non-medical hospital logistics management, including planning, procurement, storage, distribution, inventory recording, and inventory monitoring. The findings are expected to contribute to the theoretical development of internal control in the public healthcare sector while providing practical recommendations for improving the efficiency and sustainability of hospital logistics management.

RESEARCH METHODS

This study employed a qualitative research design with a descriptive approach. Qualitative research is an empirical form of inquiry conducted systematically to understand, interpret, and construct meaning from a phenomenon within its natural context. (Kusumawardani et al., 2015) The study was conducted at the UGM Academic Hospital, Yogyakarta, Indonesia. This site was selected because UGM Academic Hospital is a teaching hospital that has implemented an independent financial management system, requiring an effective internal control system for hospital logistics management to support operational efficiency.

The study utilized both primary and secondary data sources. Primary data were collected through in-depth interviews with key informants who were directly involved in non-medical hospital logistics management at UGM Academic Hospital. Informants were selected using a purposive sampling technique, whereby individuals were chosen based on their knowledge, experience, and direct involvement in the planning, procurement, storage, distribution, and monitoring of non-medical hospital logistics. This sampling technique was employed to ensure that the information obtained was relevant to the objectives of the study. Secondary data were obtained from hospital documents, including Standard Operating Procedures (SOPs), logistics utilization and distribution reports, internal policies, and other supporting documents. (Creswell, 2016)

The key informants involved in this study are presented in Table 2 :

Table 2. Research Informants

No	Informants	Department
1	Head of General Administration Division	General Administration Division
2	Warehouse Administrator	General Administration Division
3	Head of Procurement Unit	Procurement Unit
4	Contract Administration Officer	Procurement Unit
5	Head Nurse of Bima 5 Ward	Inpatient Care Unit
6	Head Nurse of Bima 3 Ward	Inpatient Care Unit
7	Head Nurse of Parikesit 5 Ward	Inpatient Care Unit
8	Head Nurse of Anesthesiology and Intensive Care	Anesthesiology and Intensive Care Unit

Source : Secondary Data from UGM Academic Hospital, 2025

Data were analyzed using the qualitative data analysis model proposed by Miles (2014), which consists of three interrelated stages: data condensation, data display, and conclusion drawing/verification. Data condensation involved selecting, focusing, abstracting, simplifying, and transforming data obtained from in-depth interviews, observations, and document reviews to produce meaningful and well-organized information. The condensed data were subsequently presented in the form of narrative descriptions supported by tables and figures to facilitate interpretation. The final stage involved drawing and verifying conclusions through an iterative process of comparing the research findings with field data and relevant theoretical frameworks to ensure the validity of the study findings.

The trustworthiness of the data was evaluated using four criteria: credibility, transferability, dependability, and confirmability. These criteria were applied to ensure that the findings accurately reflected the empirical data collected in the field while minimizing researcher bias and subjectivity throughout the analytical process. Credibility was enhanced through methodological triangulation by comparing data obtained from in-depth interviews, observations, and document reviews, thereby allowing findings to be corroborated across multiple data sources. Furthermore, the study adhered to established research ethics principles, including voluntary participation through informed consent, protection of informants' confidentiality, respect for participants' rights, and the maintenance of researcher integrity and objectivity throughout the data collection and analysis processes. (Rijali, 2018)

RESULTS AND DISCUSSION

The findings indicate that the implementation of the internal control system for hospital logistics management at UGM Academic Hospital has incorporated all five components of the COSO Internal Control Framework : the control environment, risk assessment, control activities, information and communication, and monitoring. Overall, each component has been implemented through various organizational policies and operational procedures that support hospital logistics management. Nevertheless, the study identified several weaknesses, including the lack of integrated inventory data across hospital units, delays in procurement processes, and suboptimal control over the use of consumable supplies. These findings suggest that the effectiveness of the internal control system depends not only on the existence of procedures and information systems but also on the quality of logistics planning, users' compliance with established procedures, and the effectiveness of continuous monitoring. The following discussion is organized according to the five components of the COSO Internal Control Framework to

evaluate the implementation of internal controls at UGM Academic Hospital in relation to the theoretical framework and previous studies.

As an overview of hospital logistics management at UGM Academic Hospital, Figure 1 presents the five categories of non-medical logistics supplies with the highest utilization during the 2021–2025 period :

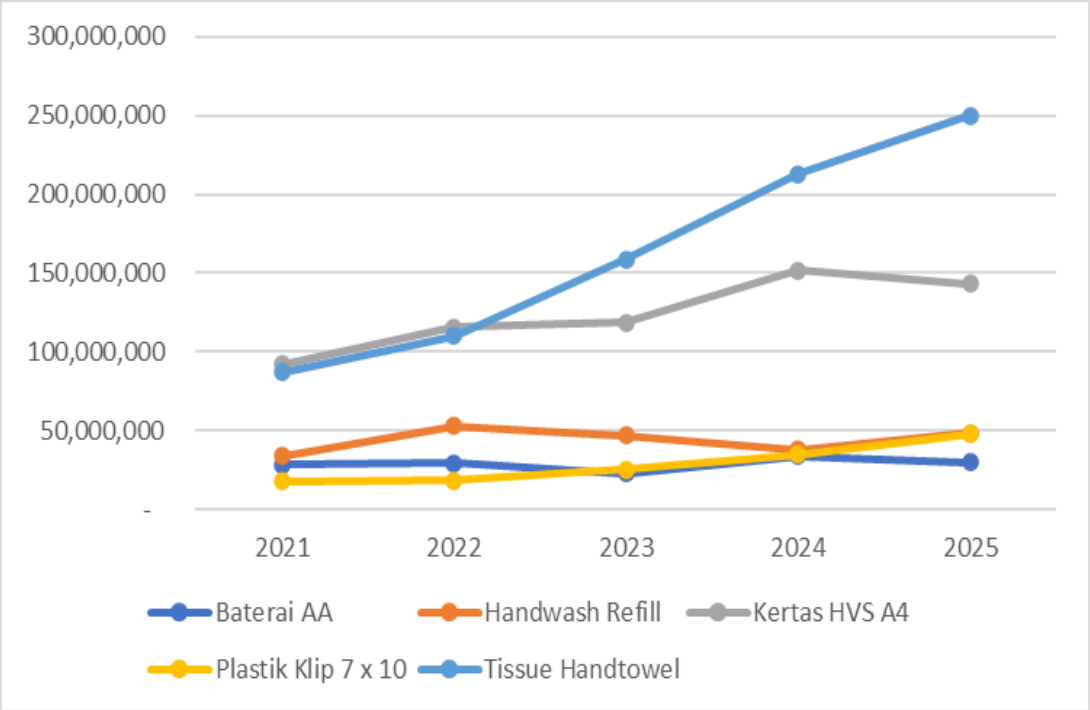

Figure 1. Distribution Trends of Key Non-Medical Logistics Supplies
Source: Secondary Data from UGM Academic Hospital, 2026

Figure 1 illustrates the annual distribution of the five most frequently used non-medical logistics supplies at UGM Academic Hospital during the 2021–2025 period. Hand Towel Tissue demonstrated a consistent upward trend and recorded the highest distribution volume by 2025. Meanwhile, the distribution of Handwash Refill exhibited an initial increase, followed by a decline in 2024, before increasing again in 2025. A4 Copy Paper exhibited a relatively stable trend with moderate growth. Plastic Clip Bags gradually increased over the study period, while AA Batteries remained relatively stable before experiencing a slight decline in the final year. These consumption patterns highlight the importance of implementing an effective internal control system for hospital logistics, particularly in demand planning, procurement, inventory management, and usage monitoring, to minimize waste, prevent stock shortages, and improve operational efficiency.

Control Environment

The findings demonstrate that the control environment for hospital logistics management at UGM Academic Hospital has been established through a clearly defined organizational structure, appropriate segregation of duties, the implementation of Standard Operating Procedures (SOPs), and management's commitment to promoting integrity, transparency, and efficient resource utilization. These conditions indicate that the hospital has established a solid foundation for internal control, consistent with the COSO framework, which emphasizes an organizational culture that supports the achievement of

organizational objectives through ethical behavior, accountability, and competent human resources. (COSO, 2013)

The study further revealed that a culture of efficiency has become an integral part of the working environment at UGM Academic Hospital. This is reflected in regular communication and awareness programs encouraging employees to use non-medical logistics efficiently, particularly consumable supplies such as tissue, hand soap, and office stationery. As one participant stated :

"We continually remind each unit to use supplies according to their actual needs and avoid excessive requests because every item must be properly accounted for." (Head of the General Administration Division, interview 2026) This statement demonstrates that management is actively involved not only in establishing organizational policies but also in fostering a strong control culture through continuous communication with all hospital units. Despite these positive findings, the study identified that compliance with the use of Sistema (Sistem Informasi Terintegrasi dan Mandiri), the hospital's logistics management information system, has not yet been fully optimized. Several departments continue to request logistics supplies outside the Sistema platform when urgent needs arise. This finding indicates that the effectiveness of the control environment depends not only on the existence of Standard Operating Procedures but also on employees' commitment to consistently using the established information system. An effective control environment requires all organizational personnel to consistently comply with organizational policies and procedures.

These findings are consistent with those of Thabit (2017), who reported that organizational culture, leadership, and employee integrity are critical determinants of an effective internal control system. However, the present study extends previous research by demonstrating that, within a hospital setting, the effectiveness of the control environment is also influenced by employees' acceptance of digital transformation in hospital logistics management. From a practical perspective, strengthening the control environment at UGM Academic Hospital should involve not only the development and enforcement of Standard Operating Procedures but also initiatives to improve employees' compliance with the hospital's integrated information system. Greater adherence to the digital logistics management system is expected to enhance the consistency, transparency, and accuracy of inventory management processes while supporting more effective internal control.

Risk Assessment

The findings indicate that UGM Academic Hospital has identified various risks that may affect non-medical hospital logistics management, including procurement delays, inventory discrepancies, fluctuations in supply prices, increased demand resulting from a higher Bed Occupancy Rate (BOR), and the potential overuse of consumable supplies. These risks are evaluated through logistics requirement analyses, monitoring of supply utilization, and reviews of demand data submitted by individual hospital units. One participant explained:

"Sometimes the inventory recorded in the system appears to be almost depleted, even though supplies are still available in the service units. Therefore, procurement decisions do not always reflect the actual inventory conditions." (Logistics Warehouse Administrator, interview 2026)

This statement indicates that the primary risks arise not only from external factors but also from limitations in the information available for decision-making. According to COSO (2013), risk assessment should be conducted continuously while considering changes in the organizational environment so that appropriate

control measures can be implemented in response to emerging risks. In the present study, although risk identification has been carried out, the risk assessment process remains largely operational and is not yet fully supported by an integrated inventory information system across hospital units.

This situation occurs because inventory monitoring is still concentrated at the central warehouse, while inventory levels in individual service units are not recorded in real time. Consequently, logistics planning remains reactive, responding primarily to requests from hospital units rather than being based on predictive analyses of historical consumption patterns. These findings support those of Nona (2025), who reported that the effectiveness of internal control largely depends on an organization's ability to identify and mitigate operational risks. The present study extends this finding by demonstrating that integrated information systems play a crucial role in enhancing the quality of risk assessment in hospital logistics management. From a practical perspective, UGM Academic Hospital should develop a demand forecasting system based on historical logistics consumption data to improve the timeliness and efficiency of procurement activities.

Control Activities

The findings demonstrate that control activities have been implemented throughout all stages of hospital logistics management, including logistics planning, procurement, receiving, storage, distribution, and physical inventory verification (stocktaking). Each process is supported by Standard Operating Procedures (SOPs), authorization mechanisms, documentation, and segregation of duties among organizational units, thereby minimizing the risk of misuse of authority. During the procurement process, every logistics request follows a structured procedure involving departmental submission, verification, preparation of the Owner's Cost Estimate (HPS), supplier selection, and receipt of goods at the central warehouse. As stated by one participant:

"All procurement activities must follow the Standard Operating Procedures, including verification, market price surveys, and approval according to the established authorization limits." (Procurement Officer, interview 2026)

These findings indicate that the hospital's control activities comply with the principles of authorization and documentation described in the COSO framework. Control activities comprise the policies and procedures established to ensure that every stage of logistics management—including planning, procurement, receiving, storage, distribution, and inventory recording—is conducted in accordance with organizational policies while supporting hospital operational efficiency.(COSO, 2013)

Nevertheless, the study found that procurement delays remain a recurring issue due to lengthy administrative procedures and suboptimal logistics planning. Consequently, several hospital units submit requests outside the official information system when inventory levels become critically low. This finding suggests that the effectiveness of control activities depends not only on the existence of formal procedures but also on the organization's ability to conduct predictive logistics planning. When planning is based solely on current inventory conditions without considering historical consumption trends, procurement becomes reactive and may negatively affect the continuity of hospital services.

These findings are consistent with Rismayanti (2009), who argued that logistics control aims to ensure the availability of supplies in the right quantity, at the right time, and in the most efficient manner. The present study further

demonstrates that the effectiveness of control activities in hospitals is also influenced by the quality of demand forecasting conducted before the procurement process begins.

With respect to the Procurement of Goods and Services (PBJ), the findings indicate that procurement follows a structured administrative process, beginning with departmental requests, verification by the General Administration Division, procurement by the Procurement Unit, and the receipt of supplies at the warehouse. This mechanism demonstrates that UGM Academic Hospital has implemented the principles of transparency and accountability in its procurement process. However, interview findings revealed that procurement delays remain common because the procurement process requires considerable administrative time, whereas hospital service units often require supplies immediately. As a result, some units submit requests outside the official information system, potentially creating discrepancies between recorded and actual inventory levels.

To illustrate the procurement process for non-medical hospital logistics at UGM Academic Hospital, Figure 2 presents the procurement workflow, beginning with logistics planning by the requesting unit, followed by request submission, verification, and procurement procedures carried out by the responsible departments according to the procurement value. The flowchart illustrates the coordination among organizational units in supporting an effective and structured internal control system for hospital logistics management.

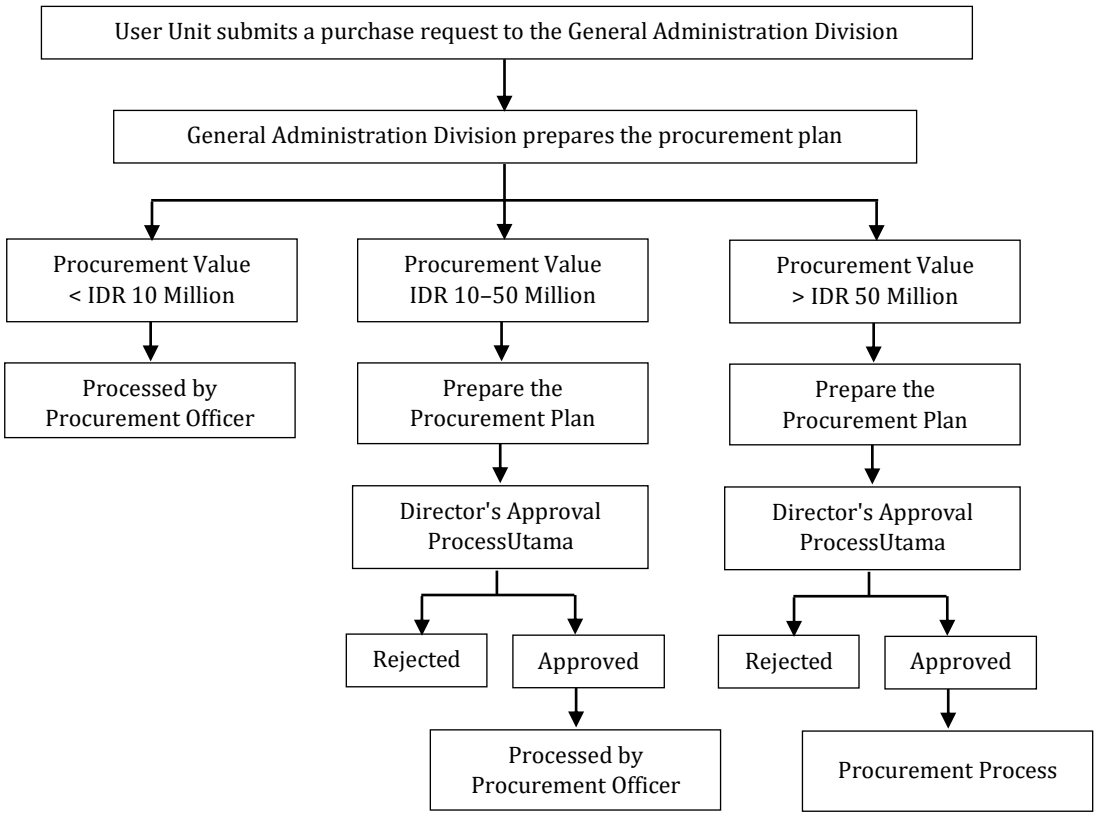

Figure 2. Workflow of the Hospital Logistics Procurement Process
Source: Authors' illustration, 2026.

Further analysis revealed that the challenges in the Procurement of Goods and Services (PBJ) process are attributable not only to lengthy administrative procedures but also to the fact that logistics planning has not yet been fully predictive or based on actual consumption data. Consequently, procurement

activities are frequently reactive and initiated only when inventory levels become critically low. In addition, the evaluation of procurement performance remains primarily focused on the availability of supplies rather than on the effectiveness of the procurement process itself. Procurement performance should also be assessed using efficiency indicators such as delivery timeliness, conformity of delivered quantities, product quality, and the effectiveness of budget utilization.

Information and Communication

The findings indicate that UGM Academic Hospital has implemented a digital information system, Sistema, to support the request, recording, distribution, and reporting of non-medical hospital logistics. Communication among hospital units is also facilitated through direct coordination, telephone calls, and instant messaging applications, enabling logistics-related information to be communicated promptly. As one participant explained :

"Whenever an item is out of stock or has not yet arrived, we immediately notify the relevant unit through telephone calls or communication groups." (Logistic Warehouse Administrator, interview 2026)

This statement indicates that operational communication functions effectively in supporting the continuity of hospital services. However, the study found that inventory information remains insufficiently accurate because warehouse inventory data are not fully integrated with inventory records maintained by individual service units. Consequently, procurement decisions are not always based on actual inventory conditions throughout the hospital. The findings further suggest that inadequate integration of the information system reduces the accuracy of procurement-related decision-making. Inventory records that do not accurately reflect actual stock levels may result in either excessive procurement or delayed replenishment. These findings indicate that effective communication within an internal control system depends not only on the timely exchange of information but also on the quality and accuracy of the data used for decision-making.

These findings are consistent with those reported by Rambe (2025), who argued that the implementation of information technology in hospital management can improve service delivery, inventory recording, logistics management, and distribution while reducing documentation errors through integrated information systems. Therefore, the quality of the information system is a critical factor in supporting effective internal control and informed managerial decision-making. This finding also supports Yasmin D & Harahap (2025), who emphasized that an effective internal control system should ensure the accuracy of inventory records and their consistency with actual inventory conditions to minimize the risks of errors and asset losses.

Accordingly, UGM Academic Hospital should further develop its inventory management system to enable inventory tracking and recording down to the individual service-unit level, thereby improving inventory accuracy and transparency. A more integrated information system is also expected to enhance the efficiency of inventory management while facilitating real-time inventory monitoring. These findings are supported by Nona (2025), who concluded that integrated information systems improve the effectiveness of internal control and facilitate organizational oversight.

Monitoring and Evaluation

The findings indicate that UGM Academic Hospital has implemented monitoring activities through internal audits, evaluations of logistics utilization, periodic

physical inventory counts (stocktaking), managerial supervision, logistics requirement analyses, and follow-up actions for all identified inventory discrepancies. These monitoring activities are intended to ensure that all internal control procedures are implemented in accordance with established policies and contribute to operational efficiency. As one participant stated:

"We conduct stocktaking every month, and whenever discrepancies are identified, we immediately investigate their causes." (Logistic Warehouse Administrator, interview, 2026)

This statement demonstrates that monitoring has become an integral component of the internal control cycle at UGM Academic Hospital. Nevertheless, the study found that monitoring activities remain primarily concentrated on the central warehouse, whereas inventory supervision at the service-unit level has not yet been fully optimized. As a result, the hospital is unable to promptly detect inventory discrepancies, thereby increasing the risk of waste and procurement delays. According to COSO (2013), monitoring should be performed continuously across all components of the internal control system so that weaknesses can be identified and corrected in a timely manner. The present findings indicate that the effectiveness of monitoring is strongly influenced by the degree of inventory data integration and the capability of the information system to provide real-time information.

These findings are consistent with those of Espinosa & Jaramillo (2024), who identified continuous monitoring as a key determinant of an effective internal control system. The present study extends this evidence by demonstrating that, in the context of hospital logistics management, monitoring becomes more effective when supported by an integrated information system capable of tracking inventory levels at the service-unit level. From a practical perspective, these findings highlight the need for UGM Academic Hospital to develop a digital inventory monitoring dashboard that enables management to monitor inventory levels in real time. Such a system would facilitate faster and more accurate evaluation and decision-making processes while improving the operational efficiency of hospital logistics management.

The findings indicate that the implementation of internal control in the management of non-medical hospital logistics supplies at UGM Academic Hospoital has contributed to improving the hospital's operational efficiency. This is reflected in structured demand planning, effective inventory control, and coordination among organizational units, which support the availability of supplies in accordance with operational requirements. Internal control also helps minimize the risks of stock shortages and excess inventory, thereby promoting more efficient utilization of organizational resources. The findings further suggest that the effectiveness of internal control is influenced by the consistent implementation of established procedures, interdepartmental coordination, and the support of information systems capable of providing accurate inventory data. Nevertheless, the lack of full integration of inventory data across clinical service units continues to affect the accuracy of procurement decision-making.

These findings are consistent with Herlambang (2016), who argued that operational efficiency reflects an organization's ability to optimize resource utilization while minimizing waste. Likewise, Heizer (2023) emphasized that effective inventory control is essential to preventing overstock and stockout conditions, both of which can increase operational costs. The results also support the findings of Yaduvanshi & Sharma (2017), who suggested that operational efficiency is not only associated with cost reduction but also with improvements in

service quality. Therefore, strengthening information system integration and implementing continuous monitoring are essential to further enhance the effectiveness of internal control and improve operational efficiency in hospital logistics management.

CONCLUSION

This study demonstrates that the implementation of the internal control system for non-medical hospital logistics management at UGM Academic Hospital has generally been aligned with the five components of the COSO Internal Control Framework: the control environment, risk assessment, control activities, information and communication, and monitoring. The implementation of these components has supported hospital logistics management through a clear segregation of duties, the application of Standard Operating Procedures (SOPs), the utilization of an information system for logistics requests and inventory recording, and the regular implementation of monitoring and evaluation activities. Collectively, these internal control practices contribute to improving hospital operational efficiency by ensuring the availability of logistics supplies according to operational needs while minimizing the risk of resource waste.

Nevertheless, the study also identified several challenges affecting the effectiveness of the internal control system. These include the lack of integration between inventory data maintained by the central warehouse and individual service units, procurement delays, logistics planning that remains largely reactive, and suboptimal control over the utilization of consumable supplies. These findings indicate that the effectiveness of internal control depends not only on organizational policies, procedures, and governance structures but also on the quality of the information system, the accuracy of inventory data, users' compliance with established procedures, and the effectiveness of continuous monitoring.

From a theoretical perspective, this study reinforces the applicability of the COSO Internal Control Framework in the context of hospital logistics management by demonstrating that the five components of internal control are interrelated in supporting organizational operational efficiency. Furthermore, the study contributes to the literature on internal control in the healthcare sector by highlighting that the integration of inventory information systems is a critical factor influencing the effectiveness of all COSO components, particularly risk assessment, control activities, information and communication, and monitoring.

From a practical perspective, the findings provide valuable insights for the management of UGM Academic Hospital and other hospitals seeking to strengthen internal control over non-medical hospital logistics management. Recommended initiatives include developing an integrated inventory information system that extends to the service-unit level, implementing data-driven logistics planning based on historical consumption patterns and demand forecasting, improving employees' compliance with digital logistics procedures, and strengthening real-time, data-driven monitoring. These measures are expected to improve resource utilization, reduce the risks of inventory shortages and unnecessary waste, and ultimately enhance the quality and sustainability of hospital services.

This study has several limitations. It was conducted in a single teaching hospital using a qualitative research approach; therefore, its findings cannot be generalized to all hospital settings. Future research should conduct comparative studies across hospitals with different organizational characteristics, employ mixed-methods or quantitative approaches to measure the contribution of each

COSO component to operational efficiency, and develop integrated information system-based logistics control models that support faster, more accurate, and sustainable decision-making. Such studies are expected to contribute to the development of more adaptive hospital logistics management models capable of responding to advances in information technology and the increasing complexity of healthcare services.

ACKNOWLEDGMENTS

The authors would like to express their sincere gratitude to UGM Academic Hospital for granting permission and providing support throughout the research process. The authors also thank all research participants, particularly the staff of the General Administration Division, the Procurement Unit, the Logistics Warehouse Unit, and the Clinical Service Units, for their valuable cooperation, assistance during data collection, and insightful contributions to this study. The authors further acknowledge everyone who provided support, constructive feedback, and assistance that contributed to the successful completion of this research.

REFERENCES

Adeboye, E. O., Ifeanyi, E. V., & Labisi, G. (2021). Redesigning Internal Controls for Small Enterprises: A COSO-Based Framework for Fraud Prevention and Regulatory Compliance. *Iconic Research and Engineering Journals*, *4*(9), 334–344.

Anisa, P. R., Afif, M. N., & Melani, M. M. (2023). Analisis Penerapan Sistem Pengendalian Internal Atas Persediaan Barang Dagang pada PT . Indomarco Prismatama Cabang Bogor 1. *Jurnal Of Social Science Research*, *3*(6), 1596–1605.

COSO. (2013). *Internal Control - Integrated Framework (Executive Summary)* (Issue May). Committee of Sponsoring Organizations of the Treadway Commission (COSO).

Creswell, J. W. (2016). *Research Design : Pendekatan Metode Kualitatif, Kuantitatif dan Campuran*. Pustaka Pelajar.

Dharmmesta, B. S., & Handoko, H. (2018). *Manajemen Pemasaran : Analisis Perilaku Konsumen Edisi Pertama Cetakan Ketujuh* . BPFE.

Espinosa, M. T., & Jaramillo. (2024). Internal Control in Companies from the Perspective of the COSO. *Management (Montevideo) = AG Management*, *2*(28). https://doi.org/10.62486/agma202428

Febriani, S., Arif, M., & Nurwani. (2024). Analisis Sistem Pengendalian Internal Persediaan Barang Dagang Menggunakan The Committee Of Sponsoring Organization Of Treadway Commission (COSO) Pada Distributor Sparepart Kendaraan Bermotor Oriens Jaya Medan. *Jurnal Manajemen Dan Bisnis Ekonomi*, *2*(1). https://doi.org/https://doi.org/10.54066/jmbe-itb.v2i1.996 Received Agustus

Heizer, J., Render, B., & Munson, C. (2023). *Operations Management: Sustainability and Supply Chain Management* (14th ed.). Pearson.

Herlambang, S. (2016). *Manajemen Pelayanan Kesehatan Rumah Sakit : Cara mudah memahami manajemen pelayanan di rumah sakit dan organisasi pelayanan kesehatan lainnya*. Goyshen Publishing.

Kawatu, B. M. L., Tinangon, J. J., & Gerungai, N. Y. T. (2020). Analisis Sistem Pengendalian Internal Persediaan Barang Dagangan Pada PT. Daya Anugrah Mandiri Cabang Manado. *Jurnal Riset Akutansi*, *15*(2), 193–203. https://doi.org/https://doi.org/10.32400/gc.15.2.28173.2020

Kusumawardani, N., Soerachman, R., Laksono, A. D., Indrawati, L., Sari H, P., & Paramita, A. (2015). *Penelitian Kualitatif di Bidang Kesehatan*. Kanisius.

Lee, S., Weng, T., & Huang, H. (2021). Internal Control Efectiveness : A Study of Medical Institutions. *Corporate Ownership & Control*, *18*(3), 66–74. https://doi.org/10.22495/cocv18i3art6

Miles, M. B., Huberman, A. M., & Saldaña, J. (2014). *Qualitative Data Analysis : A Methods Soucebook Edition 3* (3rd ed.). Sage Publications.

Nona, M. F., Rengga, A., & Luju, E. (2025). Peran Pengelolaan Persediaan Barang dalam Meningkatkan Efisiensi Keuangan di CV Sumber Jaya Putra Perkara. *Jurnal Penelitian Manajemen Dan Inovasi Riset*, *3*(6), 197–207. https://doi.org/https://doi.org/10.61132/lokawati.v3i6.2307

Pemerintah Indonesia. (2021). *Peraturan Pemerintah Republik Indonesia Nomor 47 Tahun 2021 Tentang Penyelenggaraan Bidang Perumahsakitan Lembaran Negara Republik Indonesia Tahun 2021 Nomor LN.2021 Nomor 57*.

Pemerintah Indonesia. (2023). *Undang-Undang Republik Indonesia Nomor 17 Tahun 2023 Lembaran Negara Republik Indonesia Tahun 2023 Nomor 1O5*.

Prana Iswari, S., Wiyono, J., Septyasih, R., Prastiwi, S., Kemenkes Malang Jl Besar Ijen, P., & Malang, C. (2022). Hubungan Dukungan Keluarga dengan Tingkat Kecemasan pada Pasien Pre General Anestesi di Rumah Sakit Hasta Husada. In *Jurnal Keperawatan Terapan (e-Journal)* (Vol. 08, Issue 02). https://doi.org/https://doi.org/10.31290/jkt.v8i2.3765

Rahmatullah, M., Mahsyar, A., & Rahim, S. (2020). Manajemen Logistik Non Medis di Rumah Sakit Umum Daerah Salewangan Maros. *Kajian Ilmiah Mahasiswa Administrasi Publik (KIMAP)*, *1*(3). https://doi.org/https://doi.org/10.26618/kimap.v1i3.3744

Rambe, D. H., Lubis, M., Ritonga, N., & Purba, H. (2025). Solusi Teknologi SIMRS dalam Meningkatkan Kualitas Layanan Kesehatan Publik di Indonesia. *JRIKUF: Jurnal Riset Ilmu Kesehatan Umum*, *3*(1), 33–43. https://doi.org/https://doi.org/10.57213/jrikuf.v3i1.488

Ratiani, L. P., & Masdiantini, P. R. (2022). Analisis Penerapan Sistem Pengendalian Internal Atas Persediaan Barang Dagang Berdasarkan Committee Of Sponsoring Organization (COSO) Pada PT. Edie Arta Motor. *Jurnal Ilmiah Mahasiswa Akutansi*, *13*(04), 1209–1220. https://doi.org/https://doi.org/10.23887/jimat.v13i04.37502

Rijali, A. (2018). Analisis Data Kualitatif. *Jurnal UIN Antasari*, *17*(33), 81–95. https://doi.org/https://doi.org/10.18592/alhadharah.v17i33.2374

Rismayanti. (2009). *Analisis Perencanaan Pengadaan Barang Umum di Bagian Logistik Umum Rumah Sakit "X" Jakarta Tahun 2009*. Universitas Indonesia.

Tampubolon, L., Hartono, B., & Mulya, A. (2025). Analisis Manajemen Perencanaan Logistik Non Medis di RS Pekanbaru Medical Center Tahun 2024. *Jurnal Kesehatan Tambusai*, *6*(1), 1159–1167. https://doi.org/10.31004/jkt.v6i1.40836

Thabit, T. H., Solaimanzadah, A., & Al-Abood, M. T. (2017). The Effectiveness of COSO Framework to Evaluate Internal Control System : The Case of Kurdistan Companies. *Cihan International Journal of Social Science*, *1*(1), 44–54. https://doi.org/https://ssrn.com/abstract=3168888

Yaduvanshi, D., & Sharma, A. (2017). Lean Six Sigma in Health Operations:Challenges and Opportunities—'Nirvana for OperationalEfficiency in Hospitals in aResource Limited Settings.' *Journal of Health Management*, *19*(2), 203–213. https://doi.org/10.1177/0972063417699665

Yasmin D, M., & Harahap, S. H. (2025). Analisis sistem pengendalian internal dalam menunjang efektivitas persediaan barang Pendahuluan Uraian Teori. *Jurnal Akuntansi Dan Keuangan Kontemporer (JAKK)*, *8*(1), 83–89. https://doi.org/https://doi.org/10.30596/jakk.v8i1.24064