

Drug Storage Profile at the Pharmacy Installation Warehouse of the Regional Public Service Agency, Baubau City General Hospital

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ABSTRACT

Background: Based on the Regulation of the Minister of Health of the Republic of Indonesia Number 72 of 2016 concerning Standards of Pharmaceutical Services in Hospitals, it is stipulated that pharmaceutical personnel are required to adhere to these standards as the foundation for implementing pharmaceutical services in hospitals. **Objective:** This study aims to assess the conditions of drug storage at the Pharmacy Installation Warehouse of the Regional Public Service Agency (BLUD) of Baubau City General Hospital. **Method:** This research employed a descriptive survey method involving three respondents, namely the head of the pharmacy installation, a pharmacist, and a pharmacist assistant. The variables examined included the location of drug storage, storage methods, and the system applied in drug storage management. **Results:** The findings indicate that the storage location falls into the “good” category, with 100% compliance with the established criteria. The storage methods achieved 75% fulfillment and were classified as “fairly good.” Meanwhile, the storage system demonstrated full compliance (100%) and was categorized as “good.” **Conclusion:** Based on the study conducted at the Pharmacy Installation Warehouse of the Regional Public Service Agency (BLUD) of Baubau City General Hospital, it can be concluded that the overall evaluation confirms that both the location and storage system meet the standards of hospital pharmaceutical services, each with an achievement of 100% (“good” category). The storage methods, however, showed 75% fulfillment and thus fall within the “fairly good” category. Therefore, while drug storage management is adequate in terms of location and system, improvements are still needed in the methods dimension to achieve full alignment with the standards.

INTRODUCTION

The national legal framework defines health as a comprehensive condition encompassing physical, mental, and social aspects, rather than merely the absence of disease, thereby enabling individuals to perform productively in daily life (Republic of Indonesia Law, 2023). Within the healthcare service ecosystem, hospitals are defined as institutions that provide comprehensive healthcare services—including inpatient, outpatient, and emergency care—for individuals (Government Regulation, 2021). At the organizational level, the pharmacy installation functions as a strategic hub that ensures the availability and accuracy of information regarding pharmaceutical preparations through the management of procurement and dissemination of drug-related information to all stakeholders within the hospital (Faramita & Wiyanto, 2016). One of its key operational processes is prescription management, which constitutes the downstream phase of service delivery following the patient’s clinical follow-up by a physician (Hamzah et al., 2022).

In the context of service quality and patient safety, drug storage practices in the pharmacy installation warehouse represent a critical prerequisite that bridges the availability of preparations with their clinical utility. Management of storage areas, monitoring of environmental conditions (such as temperature and humidity), expiration control, and risk- or therapy-based arrangement contribute directly to the quality, stability, and safety of preparations to be distributed to care units. Therefore, mapping the drug storage profile within hospital pharmacy warehouses is necessary as a basis for evaluating compliance with standards, identifying gaps, and formulating continuous improvements in pharmaceutical services.

The pharmacy warehouse is a unit under the management of the pharmacy installation, serving as the central repository for storing pharmaceutical preparations and medical supplies that support

clinical services in hospitals (Nurlina et al., 2022). The main objectives of storage include preserving the quality of preparations, ensuring availability, and facilitating retrieval and supervision throughout the inventory cycle (Nasif et al., 2021). To achieve these objectives, arrangements are carried out through relevant classification schemes—for example, according to therapeutic categories, dosage forms, medical devices, and consumable medical supplies—organized alphabetically, applying the First-Expired-First-Out (FEFO) and First-In-First-Out (FIFO) principles, and supported by management information systems to maintain data accuracy and process traceability.

Safety concerns receive particular attention with LASA (Look-Alike Sound-Alike) drugs. Regulations mandate the use of special markers and separate storage locations to ensure that products with similar appearance or names are not placed in close proximity (Ministry of Health, 2016). The practice of partial capitalization (tall-man lettering) is recommended to distinguish similarly named drugs, thereby minimizing the risk of selection or dispensing errors (Rahmatullah et al., 2023).

From a governance perspective, inventory management in pharmacy installations must be implemented effectively and efficiently to ensure that drugs are available on time, in adequate quantities, of assured quality, and at affordable prices (Siregar et al., 2023). Compliance with storage standards is essential to prevent both physical and chemical damage to preparations. Nevertheless, operational challenges are still encountered, such as arrangements inconsistent with alphabetical systems (Sukmawati et al., 2022). In inventory control, stock cards play a strategic role not only in updating balances but also as the basis for planning and evaluating drug utilization (Handayani et al., 2024). Ultimately, drug stability is a prerequisite for achieving therapeutic effectiveness; this is supported by storage practices that comply with standards, monitoring of environmental conditions (e.g., temperature and humidity), and accurate documentation throughout the supply chain (Qiyaam et al., 2016).

A study conducted at the Pharmacy Installation of Siloam Hospital Manado reported that warehouse storage and distribution procedures met approximately 80% of the provisions of the Hospital Pharmaceutical Service Standards as stipulated in Minister of Health Regulation No. 58 of 2014 (Julianti, 2017). Nevertheless, improvement recommendations were still proposed, including the installation of grilled windows to strengthen security and arrangements based on therapeutic classes/efficacy to enhance safety and drug retrieval (Hokilia et al., 2024).

Research by Sukmawati et al. (2022) showed that the drug storage system/principles in the evaluated context were categorized as “good,” with 100% compliance. This assessment was based on structured interviews with three key informants—the Head of the Pharmacy Installation, a Pharmacist, and a Pharmacist Assistant—ensuring greater validity of the operational information obtained in the field.

At Baubau City General Hospital, the Pharmacy Installation operates under the coordination of the Head of the Nursing Division. One of its functional units is the drug warehouse, which is responsible for storing and managing pharmaceutical inventory to ensure that the quality of preparations is maintained throughout the internal supply cycle. Given the warehouse’s role as a node determining availability, quality, and safety of drug use, mapping the actual conditions is essential to assess compliance with standards, identify areas requiring improvement, and provide a policy basis for continuous enhancement.

Based on the description above, the author is interested in carrying out a study entitled “Drug Storage Profile at the Pharmacy Installation Warehouse of the Regional Public Service Agency (BLUD) of Baubau City General Hospital.” This study aims to systematically describe the drug storage profile at the Pharmacy Installation Warehouse of BLUD Baubau City General Hospital. The research seeks to evaluate the compliance of location, methods, and storage systems with applicable regulations, while also providing an objective overview of current practices as a basis for process improvement.

Method

Research Design

This study employed a descriptive survey design to capture factual conditions based on field findings. The survey focused on drug storage practices in the pharmacy installation warehouse, with three main variables: (1) storage location, (2) storage methods, and (3) storage system.

The research data were obtained through interviews with three key respondents: the Head of the Pharmacy Installation, a Pharmacist, and a Pharmacist Assistant.

Time and Place of Research

This study was conducted from May to July 2025 at the Pharmacy Warehouse of the Regional Public Service Agency (BLUD) of Baubau City General Hospital.

Definisi Operasional Variabel

Tabel 1 Definisi Operasional Variabel

Variabel	Operational Definition	Measurement Instrument	Measurement Criteria
Drug Storage Location	Availability and compliance of storage facilities: refrigerators/freezers for temperature-sensitive preparations; separation and labeling of high-alert medications and concentrated electrolytes; management of LASA (Look-Alike Sound-Alike) drugs through physical separation and special labeling; dedicated cabinets for narcotics/psychotropics that are sturdy, double-locked, securely located, accessible only to the responsible pharmacist, and not mixed with non-drug items; special cabinets for hazardous and toxic materials (B3) with hazard symbols, accompanied by MSDS, spill kits, eye washers, and safety showers; separate and easily accessible trolleys/kits for emergency drugs to ensure availability during critical situations.	Checklist	Good >75%; Fair 60–75%; Poor <60%
Drug Storage Method	Alphabetical arrangement A–Z; classification according to type/dosage form and therapeutic/efficacy class.	Checklist	Good >75%; Fair 60–75%; Poor <60%.
Drug Storage System	Application of FEFO (First-Expired-First-Out) and FIFO (First-In-First-Out) in storage and distribution; consistency verified through stock cards.	Checklist	Good >75%; Fair 60–75%; Poor <60%

Population

The population in this study consisted of pharmaceutical personnel at BLUD RSUD Kota Baubau..

Sample

The sample in this study included three key informants: the Head of the Pharmacy Installation, the Responsible Pharmacist, and the Pharmacy Assistant at BLUD RSUD Kota Baubau.

Research Instrument

The instrument used in this study was a descriptive observation sheet in the form of a checklist, followed by interviews with respondents who were willing to provide the information required by the researcher.

Data Collection Technique

Data for this study were obtained directly by the researcher at the pharmacy warehouse of BLUD RSUD Kota Baubau using a descriptive observation sheet in the form of a checklist

Data Analysis Technique

Data yang diperoleh dalam penelitian ini dianalisis secara deskriptif dan disajikan dalam bentuk tabel checklist berdasarkan kondisi di gudang farmasi BLUD RSUD Kota Baubau. Skor hasil dihitung menggunakan analisis persentase:

$$\text{Persentase} = \frac{\text{jumlah nilai yang benar}}{\text{jumlah soal}} \times 100\%$$

Where: a score of 1 was given for “yes” answers,
a score of 0 was given for “no” answers.

The results of variable assessment were categorized into three levels: Good if the percentage was greater than 75%, Fair if it was between 60% and 75%, and Poor if it was less than 60% (Sukmawati et al., 2022).

RESULTS AND DISCUSSION

This study was conducted at the Pharmacy Warehouse of the Regional Public Service Agency (BLUD) of Baubau City General Hospital with the objective of evaluating the conformity of drug storage practices at the facility. The assessment focused on three variables, namely the drug storage location, drug storage method, and drug storage system. Research data were collected through interviews with three key informants: the Head of the Pharmacy Installation, the Pharmacist, and the Assistant Pharmacist.

Table 1. Drug Storage Location

Table 1. Drug Storage Location				
No	Research Indicator	Response	Remarks	
1	Refrigerators and freezers are available.	✓Yes	Appropriate	
2	Drugs with temperature-sensitive stability are stored in facilities appropriate to their specific temperature requirements.	✓Yes	Appropriate	
3	High-alert medications are stored separately from other drugs and labeled or marked with special identifiers.	✓Yes	Appropriate	
4	Concentrated electrolytes and electrolytes at certain levels are required to be specifically labeled to facilitate identification and ensure safety.	✓Yes	Appropriate	
5	High-strength electrolytes and formulations at specific concentrations must be specially labeled for differentiation.	✓Yes	Appropriate	
6	Narcotics and psychotropics are stored in designated special cabinets in accordance with regulations.	✓Yes	Appropriate	
7	Keys to narcotics storage cabinets must not be hung and are only under the control of the responsible pharmacist on duty.	✓Yes	Appropriate	
8	Cabinets for narcotics and psychotropics are not used to store non-drug items.	✓Yes	Appropriate	
9	Cabinets for narcotics and psychotropics are designed to be immovable and equipped with two security locks.	✓Yes	Appropriate	
10	Narcotics storage cabinets must be placed in secure areas that are inaccessible and not visible to the public.	✓Yes	Appropriate	
11	Hazardous and Toxic Materials (HTMs) must be stored in special cabinets labeled with the HTM symbol in accordance with prevailing regulations.	✓Yes	Appropriate	
12	Material Safety Data Sheets (MSDS) for HTMs are provided and easily accessible.	✓Yes	Appropriate	
13	Emergency drugs are stored separately from other drug supplies.	✓Yes	Appropriate	
14	Emergency drugs are stored in the form of special trolleys or kits.			
Total		14		
Responses				
Number of Questions		Yes	No	Remarks
14		14	0	Good
$\% = \frac{14}{14} \times 100\% = 100\%$				

Source: Primary Data (2025)

Based on the checklist-based observation in the Pharmacy Installation Warehouse, the medication storage facilities demonstrated 100% compliance (categorized as good), as presented in Table 1. All fourteen evaluated parameters were met, including: the availability of refrigerators for temperature-sensitive preparations; the management of LASA (Look-Alike Sound-Alike) medications through physical separation and special labeling; the storage of narcotics and psychotropics in dedicated cabinets that are sturdy/immovable and equipped with dual locks; the management of

hazardous and toxic materials (HTMs) in dedicated cabinets labeled with the HTM symbol in accordance with regulations and accompanied by Material Safety Data Sheets (MSDS); and the arrangement of emergency drugs separately in special trolleys/kits to ensure rapid access in critical situations. These findings affirm that the warehouse facilities and layout are consistent with pharmaceutical service standards in the dimension of storage facilities.

Table 2. Methods of Drug Storage

No	Research Indicator	Response		Remarks
1.	Alphabetical arrangement: Drugs are organized in A–Z order.	✓		Compliant
2.	Grouping of preparations: Drugs are arranged according to type/form of preparation.	✓		Compliant
3.	Drugs are organized according to their dosage form.	✓		Compliant
4.	Drugs are grouped based on therapeutic class or efficacy.			
Total		3	1	
Jawaban				
Responses		Yes	No	Category
4		3	1	Cukup baik
$\% = \frac{3}{4} \times 100\% = 75\%$				

Source: Primary Data (2025)

Structured observations based on the checklist at the Hospital Pharmacy Warehouse demonstrated 75% compliance in the application of storage methods, placing it in the “fair” category (see Table 2). Of the four parameters evaluated, three were fulfilled: (1) arranging drugs alphabetically (A–Z), (2) grouping according to the type of preparation, and (3) organizing by dosage form. The implementation of these three aspects aims to accelerate retrieval and enhance service efficiency by facilitating easier drug searches for pharmacy personnel.

Table 3. Drug Storage System

No	Research Indicator	Response		Remark
1.	Drug arrangement is carried out by applying the First Expired First Out (FEFO) and First In First Out (FIFO) systems.	✓		Appropriate
2.	Drug stock cards with closer expiration dates are prioritized for distribution.	✓		Appropriate
3.	Drug distribution based on stock card records is conducted using the First In First Out (FIFO) system.	✓		Appropriate
Total		3		
Responses				
Number of Questions		Yes	No	Category
3		3		Good
$\% = \frac{3}{3} \times 100\% = 100\%$				

Source: Primary Data (2025)

Structured observations using a checklist in the Pharmacy Installation Warehouse demonstrated 100% compliance (good category) with the three evaluated parameters, including the application of the First-Expired-First-Out (FEFO) and First-In-First-Out (FIFO) systems (see Table 3). In daily operations, FIFO tends to be more dominant because, during procurement from pharmaceutical wholesalers (PBF), the installation generally receives products with longer expiration dates compared to the existing stock, resulting in stock rotation that follows the order of receipt. Nevertheless, when new batches have closer expiration dates, distribution is prioritized according to FEFO—for example, by placing the products at the front of the shelves and recording them on stock cards to ensure they are dispensed first. Thus, the warehouse applies a combined FIFO–FEFO

approach: in general, stock rotation follows FIFO, while products approaching expiration are prioritized according to FEFO to prevent loss of quality and expiration.

CONCLUSION

Based on the findings, the evaluation of the Pharmacy Installation Warehouse of the BLUD RSUD Kota Baubau indicates that the storage location and storage system have fully met the standards with 100% compliance (good category). The storage method achieved 75% (fair category), indicating a need for further procedural and technical reinforcement—particularly through standardized SOPs, periodic training, and optimization of FEFO–FIFO documentation.

This study was limited to a single pharmacy warehouse with a small number of respondents, thus generalization of the findings should be approached with caution. Future research is recommended to adopt a multi-center design with a larger sample and time-series monitoring to evaluate the impact of improvements on quality, efficiency, and patient safety more comprehensively.

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