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Original Article

Evaluation of Drug Management Systems at Talaud District Hospital Pharmacy: A Qualitative Approach

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Abstract

Background: Drug management in hospitals is a crucial component to ensure the availability, quality, and efficiency of pharmaceutical services. The aim of this study is to evaluate the drug management process in the Pharmacy Installation of Talaud Hospital based on the Ministry of Health Regulation No. 72 of 2016. **Methods:** This qualitative descriptive study was conducted in May–June 2025 using purposive sampling. Data were collected through interviews and observations. Interview guides and checklists were developed based on the national pharmaceutical service standards. **Results:** The drug selection was aligned with the hospital formulary. Planning was conducted using consumption methods, while procurement was based on e-catalogue with proper documentation. Drug storage adhered to FIFO and FEFO principles, but limited space and human resources were identified. Distribution for outpatient used an individual prescription system and inpatient used Unit Dose Dispensing (UDD). Documentation and reporting were still manual. Evaluation activities were conducted annually without specific analysis. **Conclusion:** The drug management system at Talaud Hospital generally complies with the Ministry of Health standards. However, improvements are needed in procurement timelines, staffing for clinical pharmacy services, digital documentation, and comprehensive evaluations.

Keywords: *Drug Management, Hospital Pharmacy, Talaud Hospital*

Introduction

Pharmaceutical services in hospitals are critical to ensuring safe, effective, and rational use of medicines, which ultimately contributes to improved patient outcomes, reduced medication errors, and optimised resource utilisation (WHO, 2019). Hospital pharmacies are not merely centers for drug dispensing, but strategic units responsible for the comprehensive management of medicines, including selection, procurement, storage, distribution, monitoring, and evaluation (FIP, 2022). As the scope of clinical pharmacy practice expands globally, the quality of drug management systems has become a benchmark for assessing hospital performance and health system resilience (Alomi, 2015, Ahmed & Tamim, 2025). In low- and middle-income countries (LMICs), particularly in remote and archipelagic regions, numerous challenges hinder effective pharmaceutical management. These include limited access to essential medicines, poor infrastructure, manual documentation systems, inconsistent procurement cycles, and a shortage of trained pharmacists (Ofori-Asenso & Agyeman, 2016). A well-functioning drug supply system must balance the needs of safety, timeliness, cost-efficiency, and therapeutic effectiveness (Yadav, 2015). Failure to meet these standards not only affects patient care

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but also disrupts supply chain integrity, resulting in frequent stockouts, overstocking, or expired medications.

The WHO advocates for the implementation of Good Pharmacy Practices (GPP), emphasising the need for standardised documentation, digital systems integration, and continuous performance evaluations (WHO, 2019). Tools such as ABC-VEN analysis, Economic Order Quantity (EOQ), and inventory turnover ratios are widely used in hospital settings to monitor and optimise stock levels (Peter, 2023). Moreover, the integration of Hospital Information Systems (HIS) has been shown to significantly reduce medication errors, improve transparency, and streamline procurement processes (Epizitone *et al*., 2023; Prayuda *et al*., 2021). In the context of Eastern Indonesia, particularly small island regions, health facilities often face compounded challenges due to geographical isolation. Preliminary assessments at Talaud District Hospital identified ongoing issues such as manual documentation, irregular procurement timelines, limited pharmacist involvement in clinical care, and minimal application of analytical tools in inventory management. These conditions highlight the urgent need to evaluate the hospital's drug management practices in accordance with international standards to ensure sustainable and safe pharmaceutical care. Therefore, this study aims to conduct a qualitative evaluation of drug management practices at the Pharmacy Installation of Talaud District Hospital, focusing on alignment with WHO guidelines and global hospital pharmacy standards. The findings are expected to inform improvements in logistics, human resources, and service quality within similar rural hospital contexts.

Methodology

This is a descriptive qualitative study conducted at the Pharmacy Installation of Talaud District Hospital from May to June 2025. The study employed purposive sampling, involving key informants including pharmacy heads, procurement staff, and warehouse personnel. Data collection involved structured interviews and direct observation using checklists adapted from the Ministry of Health guidelines. Data were analysed using thematic content analysis to identify patterns and categorise findings according to the main components of drug management.

Results

Drug management in hospitals begins with the stages of selection, planning, procurement, receiving, storage, distribution, recall and destruction, control, recording and reporting, as well as evaluation. The following is the observation result related to drug management at Talaud District Hospital.

Table 1: Observation Results of Drug Management at Talaud District Hospital Pharmacy Installation

Observation Variable	Yes	No	Remarks
KFT team available	√		
Hospital formulary available	√		
Treatment/therapy standards available	√		Using hospital formulary
Determination of drug types and quantities to be ordered	√		
Request report from Pharmacy to Planning Department	√		Done by the Pharmacy warehouse department
Availability of documents on drug selection and planning	√		
Procurement and Receiving Variables			
Drug procurement based on purchase order (PO)	√		Uses e-catalogue system (not direct order)
Receipt of drug donations/grants	√		From Provincial Health Office 2024, Ministry of BMHP 2022
Procurement considers minimum 2-year expiration date	√		
Dedicated shelf for PO and invoice document storage	√		
Archive shelf for returned goods		√	Stored together with other archived items
Monitoring of order status to avoid delays	√		Handled by Procurement section
Availability of COA for raw materials and MSDS for hazardous items		√	Not yet available / not yet implemented
Pharmaceuticals for research purposes		√	Not yet available / never conducted

Availability of handover documentation	√		
Storage Variables			
Drugs and chemicals labeled with name, date of opening, expiry date, special warnings	√		
High-concentration electrolytes not stored in patient care units unless urgent	√		
Electrolytes in care units labeled, secured, stored in restricted areas	√		
Patient's personal medicines, devices stored separately and identifiable	√		
Drug storage areas not used for other items that may cause contamination	√		
Flammable items stored in fireproof rooms and labeled as hazardous	√		
Medical gas stored upright, secured, labeled as hazardous	√		Not stored in main pharmacy warehouse but in a separate, monitored area
Empty gas cylinders stored separately from filled ones	√		
Gas cylinders stored with safety caps	√		Cylinders taken only when needed
Drugs, medical devices stored separately, arranged alphabetically	√		
Implementation of FIFO principle	√		
Implementation of FEFO principle	√		
Storage based on therapeutic class, dosage form, type	√		Currently based only on dosage form
LASA items not stored together, clearly marked	√		
Emergency drugs stored in a designated area	√		
Emergency drug storage easily accessible and secure	√		
Warehouse space adequate and safe for staff movement	√	√	Space is limited, but storage is secure
Warehouse has proper sanitation	√		
Adequate lighting in warehouse	√		
Drug storage area separate from service areas	√		
Roof and walls in good condition, no leakage	√		
Clean floors with pallets	√		
Adequate ventilation and air circulation	√		
Free from pests and animals	√		
Clean storage racks/cabinets available	√		
Special cabinet for specific drugs	√		
Refrigeration units for specific drugs available	√		Two refrigerators available
Equipment for moving medicines available		√	
Drugs arranged using FIFO and FEFO principles	√		
Restricted access to drug storage areas	√		
Fire extinguishers available near storage		√	
Temperature/humidity measuring tools available	√		
Air conditioners/cooling in storage area	√		
Documented records on drug storage	√		
Stock cards available	√		
Control Variables			
The use of drugs according to the RS formulary	√		
Use of medication according to diagnosis and therapy	√		
There is a special shelf for damaged and expired drugs	√		Di ruangan sendiri
Officers check ED drugs, damaged periodically	√		
There is a special shelf for medicines *slow moving/ death stock*	√		
There is documentary evidence	√		
Distribution Variables			
Floor stock system			
Drug distribution for inpatient stock managed by Pharmacy	√		
Inpatient stock matches required types and quantities	√		
If no pharmacy staff after working hours, responsibility delegated to ward officer		√	Pharmacy service is available 24/7
Drug handover from ward officer to pharmacist		√	Not yet implemented

Pharmacist provides information, warnings, interactions for each drug in floor stock	√		Directly monitored by pharmacy; clinical pharmacy not yet implemented
Distribution based on outpatient/inpatient prescription via Pharmacy	√		
For inpatient, drugs collected by patient/family/nurse?	√		Patient's family
Individual prescription prepared as single/double unit dose for inpatients	√		
Record of outbound goods from warehouse	√		
Destruction and Recall Variables			
Preparation of drug destruction list	√		
Preparation of drug destruction report	√		
Coordination of schedule, method, and site for destruction	√		
Preparation of destruction site	√		
Destruction according to dosage form and applicable regulations	√		
Drug recall conducted by BPOM or original manufacturer	√		
Record of recall activities available	√		
Recording and Reporting Variables			
Recording for: 1. Ministry of Health/BPOM requirements, 2. accreditation, 3. hospital audit, 4. pharmaceutical 5. documentation, 6. etc.	√		
Designated staff for recording Reporting includes: 1. annual pharmacy activities, 2. financial reports, 3. etc.	√		
Designated staff for reporting	√		
Dedicated archive cabinet available	√		

Discussion

Based on the observations, the selection of pharmaceutical supplies at Talaud District Hospital was based on the hospital formulary, making drug planning more efficient. The hospital formulary, which aligns with the National Formulary, supports rational drug use by increasing access to essential medicines. To promote compliance and rationality, the hospital formulary should be formulated based on therapeutic needs, proposed by prescribers, and discussed in the Pharmacy and Therapeutics Committee meetings, considering efficacy, safety, quality, and cost. The finalised formulary should be disseminated to all health workers in both hard-copy and soft-copy formats (FIP, 2022). Drug planning at Talaud Hospital uses the consumption method based on previous periods' needs, as confirmed by interviews with the Head of the Pharmacy Installation. Planning starts with stock checking by warehouse staff and proceeds through the e-Monev application, which automatically calculates drug requirements. Not all drugs are procured every month; those with sufficient stock are scheduled for future procurement periods. Efficient planning requires considering available inventory. WHO (2022) recommends that planning should avoid stockouts using defensible methods and adjust based on budget, priority, consumption history, lead time, and development plans.

The procurement process is carried out through e-catalogue systems. Drugs are received by a team comprising procurement staff, the head of the pharmacy, and warehouse personnel. Observations showed that items are checked for condition and invoice conformity (Islam, 2024). Expiry dates of at least two years are required unless for special pharmaceutical preparations like vaccines or reagents. Returned items include damaged packages, expired drugs (within 2 months), or items not listed in the purchase order. This approach is consistent with WHO procurement recommendations (WHO, 2019). The pharmacy warehouse is managed by two staff responsible for storage and distribution. Good storage preserves drug quality, improves efficiency, reduces damage/loss, optimises inventory, and informs future procurement. The warehouse, approximately 4x8 m², organises drugs by dosage form and alphabetical order. LASA drugs, high-alert drugs, narcotics, psychotropics, and refrigerated items

are stored separately. Flammable materials have a separate room, and gas cylinders are stored outside due to space limitations. The FEFO system is applied, with expiry labels placed on secondary packaging. However, due to limited human resources, administrative staff also organise inventory, necessitating training on proper storage procedures (Peter, 2023, Roy *et al*., 2025).

The hospital applies a centralised distribution system. There is no pharmacy satellite unit; all pharmaceutical needs are directly supplied by the main Pharmacy Installation. Outpatient distribution uses individual prescribing, while inpatient distribution follows the Unit Dose Dispensing (UDD) model, which sends medications per patient and per administration time. UDD has been shown to improve patient safety and reduce medication waste when supported by effective management (Boag *et al*., 2021; Dzierba *et al*., 2020). Emergency trolleys are provided in wards for urgent medical needs. However, the lack of standby pharmacists due to HR limitations means the trolleys are managed by ward nurses. When nurses are overwhelmed, patients' families collect medications. This limits pharmacists' roles in emergency preparedness and clinical pharmacy. Expired and damaged medicines are destroyed annually with third-party involvement. Recalls are handled by distributors upon BPOM notification. Documentation and coordination are carried out by pharmacy staff and sanitation units. Controlled substances are destroyed in coordination with local health authorities in accordance with laws (WHO, 2023).

Stock-taking is conducted by pharmacy and administrative staff. Tasks include verifying stock records and separating drugs near expiry. Slow-moving drugs are listed and distributed to departments to avoid expiry (Jobira *et al*., 2021). There were no dead stock items, indicating effective inventory use. All recording and reporting activities are done manually, which is time-consuming. Archive rooms and printed stock cards are used. Monthly reports include prescription volume, service waiting time, and prescription conformity with the formulary. WHO (2022) advocates digitalisation to improve traceability, accuracy, and efficiency. Drug management evaluation is performed annually but lacks depth. Tools like ABC-VEN, EOQ, and turnover analysis are not used. Integrating such tools could enhance planning, control costs, and prevent shortages (Prassetiyo *et al*., 2023, Soraya *et al*., 2022).

Conclusion

The drug management process at the Pharmacy Installation of Talaud District Hospital generally complies with the Pharmaceutical Service Standards outlined in Minister of Health Regulation No. 72 of 2016. However, several areas still require improvement. These include delays in drug procurement due to long lead times, the need for specific scheduling of pharmacists in clinical and pharmacy services due to limited human resources, the continued use of manual recording and reporting systems, and the absence of structured evaluations beyond daily operational activities. Enhancing these areas is essential to optimise the overall quality of pharmaceutical services and ensure effective and efficient drug management at the hospital.

Conflict of Interest

The authors affirm that they have no conflicting interests.

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