Biofarmasetikal Tropis e-ISSN 2685-3167
(The Tropical Journal of Biopharmaceutical) 2024, 7(2), 41-51 p-ISSN 2828-6685

Analysis of Medicine Management in the Pharmacy Installation at Hospital X of Tomohon City

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Accepted: 16 September 2024; Approved : 25 Oktober 2024

ABSTRAK

Penelitian ini bertujuan menganalisis efisiensi pengelolaan obat di RS X Kota Tomohon dengan menilai berbagai indikator, seperti seleksi, pengadaan, distribusi, dan penggunaan obat. Metode deskriptif digunakan dengan data retrospektif dan wawancara untuk mengukur kesesuaian praktik dengan standar Depkes RI, WHO, dan Permenkes. Hasil menunjukkan bahwa tahap seleksi hanya mencapai 55,65% kesesuaian dengan Fornas, sementara pengadaan menunjukkan alokasi dana 25,08%, yang masih di bawah standar. Distribusi obat menunjukkan kesesuaian penuh pada beberapa indikator, seperti persentase kecocokan fisik obat dengan kartu stok (100%) dan frekuensi kesalahan dokumentasi (0%). Penggunaan obat menunjukkan hasil yang bervariasi; peresepan antibiotik mencapai 30,2%, melebihi standar WHO ≤22,7%, mengindikasikan potensi ketidakrasionalan. Studi ini menyimpulkan bahwa, meski distribusi dan beberapa aspek pengadaan memenuhi standar, perbaikan diperlukan pada tahap seleksi dan penggunaan obat untuk meningkatkan efisiensi dan kepatuhan terhadap regulasi.

Kata kunci : Standar Pelayanan Kefarmasian, Instalasi Farmasi Rumah Sakit, Kota Tomohon

ABSTRACT

This study aims to analyze the efficiency of medicine management at Hospital X in Tomohon City by evaluating such indicators as selection, procurement, distribution, and use of drugs. It employed a descriptive method to examine retrospective data gleaned from interviews to assess the compliance of medicine management with the standards set by the Indonesian Ministry of Health, WHO, and Regulations of the Ministry of Health. The results indicated that the selection phase only reached 55.65% compliance with the National Formula, while procurement showed a budget allocation of 25.08%, which was below the standard. The distribution of drugs demonstrated full compliance on several indicators, such as the percentage of physical drug matching with stock cards (100%) and documentation error frequency (0%). Drug use showed varied outcomes in that antibiotic prescribing reached 30.2%, exceeding the WHO standard of ≤22.7%. To some extent, this indicated potential irrationality. The study concludes that while the distribution and some aspects of procurement have satisfied the standards, the selection and use of drugs require improvement to enhance efficiency and regulatory compliance.

Keywords: *Pharmaceutical Service Standards, Hospital Pharmacy Department, Tomohon City*

1. INTRODUCTION

The Regulation of the Minister of Health of the Republic of Indonesia (Permenkes RI) Number 72 of 2016 on Standards of Pharmaceutical Services in Hospitals states that pharmaceutical services in hospitals are an integral part of the health service system. These services are patient-oriented and include the provision of quality and affordable pharmaceutical supplies, medical devices, and disposable medical materials for all community levels, including clinical pharmaceutical services[1].

Medicine management in hospitals significantly influences the hospital's progress, particularly in healthcare services, the quality of

medicines, and their availability [2]. The allocation of 50–60% of a hospital's total budget to the procurement of medicines and medical devices underscores the critical importance of implementing efficient strategies for the management of pharmaceutical supplies and medical equipment[3]. Inefficiencies in medicine management can adversely impact hospitals, such as wastage, unavailability of medicines, poor distribution, and damaged drugs[4].

In response, hospitals have to implement the principles of effective and sustainable medicine management. Pharmaceutical services including selection, procurement, distribution, and usage are essential components that require meticulous attention and execution through a multidisciplinary approach in coordination with hospital staff[5]. Furthermore, strong support and collaboration from all stakeholders are crucial for the optimal implementation of hospital pharmaceutical services, resulting in improved pharmaceutical service quality, patient safety, and overall public health[4]. As such, systematic medicine management in hospitals is critical to ensure that quality medicines are sufficiently available to support high-quality healthcare services[7].

Assessing medicine management against efficiency indicators helps hospitals measure the performance of medicine management, evaluate its effectiveness, and identify issues where improvements or changes are needed to enhance the quality of medicine management[8].

Considering the crucial roles of medicine management, the present study investigates medicine management at hospitals in Tomohon City. This study aims to contribute to achieving quality pharmaceutical services, cost efficiency, inventory control, patient safety, treatment adherence, and regulatory compliance.

2. RESEARCH METHODS

Data collection was conducted using a descriptive method through retrospective and concurrent data, obtained from primary and secondary sources. Primary data analysis was conducted through interviews with relevant stakeholders. Secondary data were analyzed by calculating the values corresponding to compliance with the stages of medicine management (selection, procurement, distribution, and usage). Capturing the medicine management stages (selection, procurement, distribution, and usage), research data were analyzed for efficiency using the standards from the Indonesian Ministry of Health (2008), WHO (1993), and Regulations of the Ministry of Health (2016).

3. RESULTS AND DISCUSSION

The research results demonstrated that several indicators did not meet the standards. The selection stage did not cohere with the National Formulary (*Fornas*) or the standard indicators. Additionally, in the drug utilization stage, the number of drug items per prescription sheet and the percentage of antibiotic prescribing also fell short of the standard indicators.

Albeit these findings, the study revealed that private hospitals, owned or managed by foundations or individuals, managed to maintain more flexible management in policy-making or decision-making than state-owned ones. This is possible as they are not strictly bound by government regulations. In addition, private hospitals are generally funded by investments from investors, overall medical service fees charged to patients, private insurance, and the national health insurance program (BPJS). These multiple sources of funding allow private hospitals to offer premium healthcare services with the latest medical technology and a higher level of comfort[9]. The table below presents the research findings alongside the efficiency standards of the Indonesian Ministry of Health (2008), WHO (1993), and the Regulations of the Ministry of Health (2016).

Table 1. The compliance rate of medicine management with the efficiency indicator standards.

Stages	Indicators	Objective	Calculation	Results
Selection	The conformity of available drug items with the National Formulary[1]	To determine the utilization of drugs listed in the National Formulary.	X: Total number of drug items in the National Formulary	55,65%

e-ISSN 2685-3167
p-ISSN 2828-6685

			Y: Total number of drug items available Z: (X/Y) x 100%	
Procurement	Percentage of the allocation of available drug procurement funds[10]	To determine how much of the hospital's funds are allocated to IFRS.	X: Total drug procurement funds Y: Total hospital budget Z: (X/Y) x 100%	25,08%
	Percentage of available capital funds compared to the total funds required[10]	To determine the extent to which the hospital's funds are allocated to the pharmacy.	X: Available funds Y: Actual fund requirements	100%
	Frequency of procurement for each drug item per year [1]	To determine how many times these drugs are ordered in a year.	Taking a random sample of the drug stock cards and observing how many times the drug is ordered per year	17.84 times
	Frequency of incomplete SP/ invoice/ request discrepancies[1]	To determine how many times invoice errors occur.	Taking the SP for 3 months and matching it with the invoice.	0
	Percentage of drug items procured compared to those planned [10]	To determine the accuracy of the planning.	"X: Total number of drug items in reality Y: Total number of items in the plan Z: (X/Y) x 100%	100%
Distribution	Percentage of compatibility between the physical quantity of drugs and the stock card[11]	To determine the accuracy of warehouse staff.	Taking the drug stock card (drug stock data) and matching it with the physical inventory. Calculating the number of drug items that match the stock card (X) with the physical drug count (Y). Percentage: Z = (X/Y) x 100%.	100%
	Turn Over Ratio (TOR)[1]	To determine the capital turnover in one year of inventory.	Annual turnover at cost of goods sold (COGS) = X, Average value of drug inventory = Y, TOR = X/Y times	21,84

	Percentage and value of expired and/or damaged drugs[10]	To determine the extent of the hospital's losses.	Based on the annual records of expired drugs, the percentage of expired stock is calculated using the following formula: (Value of Expired Drugs (X)/Value of Stock Opname (Y)) x 100%	0%
	Level of drug availability[10]	To determine the rate of drug adequacy.	The stock coverage of medicines (A) is calculated using the formula (X + Y)/ (Z × 1 month) Where X represents the current stock, Y is the annual medicine usage, and Z is the average monthly usage	14 months
	Percentage of dead stock[10]	To identify unused medication items over the past 3 months.	The percentage of unused medication is calculated using the formula Z=(X/Y)×100%, where X is the number of unused medications over the past three months, Y is the total stock, and Z is the percentage of unused medications.	0%
Use	Number of medication items per prescription sheet[11]	To measure the degree of polypharmacy.	The average number of medication items per prescription is calculated using the formula X/Y, where X is the total number of medication items listed on	3.2

			prescriptions, and Y is the total number of prescription sheets.	
	Percentage of prescribing with generic names[11]	To measure the tendency to prescribe generic medications.	The percentage of medication items with generic names is calculated using the formula Z=(X/Y)×100%, where X is the number of medication items with generic names, and Y is the total number of medication items prescribed.	93.25%
	Average time required to deliver prescriptions to outpatient patients [10]	To determine the speed of pharmacy service at the hospital.	The processing time for prescriptions (Z) is determined using the formula Z=(Y−X)/total number of prescriptions received, where X is the time the prescription enters the pharmacy and Y is the time it is received by the patient (Y)	8 minutes for non-compounded prescriptions and 12 minutes for compounded prescriptions
	Percentage of prescriptions that can be delivered[11]	To measure the number of medication items delivered	The percentage of prescribed medication items (Z) is calculated by using the formula Z=(X/Y)×100%, where X is the total number of prescribed items and Y refers to the total number of delivered.	100%
	Presentation of antibiotic prescribing[11]	To measure antibiotic usage	The percentage of antibiotics prescribed (Z) is determined by using this formula (X/Y) X 100%,	30.2

			where X is the total number of antibiotics prescribed that are ≤ 22.7% of the total prescribed medications, and Y is the total number of medication items prescribed.	
	Presentation of medications that are fully labeled[11]	To assess the supervision regarding the essential information that has to be written on the label.	The percentage of medication items with labels containing the patient's name and usage instructions (Z) is calculated using this formula Z=(X/Y)×100%, where X is the number of medication items that meet the criterion, and Y is the total number of medication items given to the patient.	100%

Selection Stage

Compliance of Available Drugs with the National Formulary (Fornas)

Based on the findings in Table 1, retrospective data analysis of all drug items in the pharmacy installation at Hospital X in Tomohon City showed 55.65% compliance with the efficiency indicator standards. Drug procurement in pharmacy installations in Indonesia must adhere to Fornas, a list of essential drugs compiled and regulated by the Ministry of Health (MoH). Fornas serves as a reference for drugs funded under the National Health Insurance (JKN)[1] program. Interviews with the head of the pharmacy installation at Hospital X revealed that the hospital collaborates with BPJS, various insurance providers, and also serves private patients. However, as a private hospital, it prioritizes profitability, leading to drug procurement decisions based on the lowest prices through partnerships with pharmaceutical distributors (PBFs). Furthermore, hospital policies established by the Pharmacy and Therapeutic Committee (KFT) limit physicians to prescribing only three patented drugs. Based on the research findings at Budi Setia General Hospital, the compliance level of drug items with the efficiency indicator was 65.28%, which does not meet the established efficiency standard. This common issue in private hospitals arises due to procurement policies prioritizing discounts or low prices for both generic and patented drugs, with an additional focus on ensuring drug availability, particularly for BPJS patients.

Procurement Stage

a. Percentage of Drug Procurement Budget Allocation

As presented in Table 1, the percentage allocation of the drug procurement budget was 25.08%, falling short of the

efficiency indicator standards established by MoH in 2008[10]. This outcome is attributed to the use of consumption and epidemiological/morbidity methods in procurement planning. The consumption method relies on the previous period's usage, which, despite being straightforward, is often combined with epidemiological methods that consider disease patterns over specific periods in a population[3].

b. Percentage of Available Funds vs. Total Required Funds
Table 1 indicates that 100% of the required funds were available, meeting the MoH efficiency standards[10]. This demonstrates accurate budgeting by the hospital to meet the pharmacy installation's needs for drug and medical equipment procurement. According to interviews, procurement occurs twice monthly, based on consumption and epidemiological methods, ensuring sufficient supplies and avoiding stockouts. However, occasional national-level shortages can still lead to specific drug unavailability. Based on previous research at the Regional General Hospital (RSUD) of North Sulawesi Province, drug procurement aligns with the regional budget (APBD) and is categorized as adequate. The procurement process is conducted based on proposals from the Hospital Pharmacy Installation (IFRS) and coordinated with the Health Department[12].

c. Frequency of Drug Procurement per Item Annually
As shown in Table 1, the procurement frequency for each drug item was 17.84 times per year, classified as moderate according to the Permenkes (2016) standard, which categorizes frequencies as low (<12/year), moderate (12–24/year), or high (>24/year). While the frequency falls within acceptable standards, ongoing monitoring is essential to ensure optimal procurement intervals[1].

d. Frequency of Incomplete SP/ Invoices/ Order Compliance
Table 1 highlights a 0% error rate, indicating excellent documentation practices that align with recommended pharmaceutical management standards. Based on previous research conducted at the Pharmacy Installation of Pemalang Regency Hospital, upon the arrival of pharmaceutical supplies, checks were carried out to match the invoice with the delivered items and to ensure the ordered pharmaceutical supplies were still in acceptable condition[13]. The 2019 Technical Guidelines for Hospital Pharmaceutical Services recommend that all incoming supplies undergo thorough inspections to ensure accuracy in type, quantity, and quality[14].

e. Percentage of Planned vs. Procured Drug Items
The study findings indicate 100% alignment between planned and procured drug items, consistent with the standard range of 100–120%10. This reflects the hospital's effective planning and implementation systems, ensuring precise procurement that minimizes risks of overstocking or stockouts15. The results align with the 2019 technical guidelines for pharmaceutical services[13].

Distribution Stage

a. Accuracy of Physical Drug Count vs. Stock Cards
As shown in Table 1, distribution-stage compliance reached 100%, meeting WHO (1993) standards. This reflects the precision of warehouse staff and managers in stock management[11]. Interviews revealed that monthly stock-taking is conducted by pharmacy staff, ensuring alignment between physical inventory and the hospital's pharmacy information system (SIM). Similar findings were reported in previous research conducted at RSDK Purwokerto General Hospital, where a 100% compliance rate was achieved due to meticulous recording and verification of

e-ISSN 2685-3167
p-ISSN 2828-6685

stock cards against the physical inventory by the staff[16].

b. Turnover Ratio (TOR)
With a TOR of 21.84 (22 times per year), the hospital met the efficiency indicator standards (10–23 times/year) as per Permenkes (2016)[1]. High TOR values indicate efficient inventory turnover, whereas low TOR values suggest sales issues that could result in financial losses due to tied-up inventory[3]. Interviews with the pharmacy manager revealed that fast-moving drugs are ordered in large quantities, while slow-moving items are procured based on periodic usage.

c. Percentage of Expired or Damaged Drug
The 0% percentage of expired and damaged drugs indicates compliance with the Ministry of Health's efficiency standards[10]. However, a high percentage of expired or damaged drugs typically suggests issues with drug needs planning, inadequate storage, or unforeseen changes in disease patterns and prescriptions[3]. In the case of IFRSU X in Tomohon City, an agreement with the pharmaceutical wholesaler to return drugs 3 months prior to expiration has helped mitigate losses for the hospital. Previous research at hospital X in North Sulawesi revealed inefficiencies in this area, with a significant reduction in expired and damaged drugs from 2019 to 2022. These drugs included various dosage forms such as tablets, capsules, powders, ointments, creams, and even injectables[17].

d. Drug Availability Level
This indicator aims to evaluate the sufficiency of drug supply in the hospital, with the Ministry of Health's efficiency standard of 12-18 months. IFRSU X in Tomohon City achieved a drug availability level of 14 months. This 14-month coverage indicates a stable and standard level, ensuring that the hospital can meet patient needs. Furthermore, the research findings show a drug availability level of 16 months, which falls within the standard range of 12-18 months. This indicates that the hospital's drug inventory management is optimal. A good level of drug availability is crucial for effective pharmaceutical services[18].

e. Percentage of Dead Stock
The 0% dead stock percentage signifies efficient inventory management and effective stock rotation, aligning with the Ministry of Health's indicator[10]. This finding contrasts with similar research reporting a 4.24% dead stock percentage, attributed to the absence of a Pharmacy and Therapeutics Committee (PFT)[3]. The PFT plays a vital role in creating a hospital formulary, guiding prescribing practices among medical staff. Interviews with IFRSU X staff in Tomohon City revealed that drug procurement adheres to the hospital formulary and PFT decisions, preventing inconsistencies in prescribing, fluctuations in drug needs, and the occurrence of dead stock[19].

Usage Stage

a. Number of Drug Items per Prescription
A retrospective analysis of 2023 prescriptions revealed an average of 3.2 drug items per prescription, exceeding the WHO's recommended range of 1.3-2.2 items[11]. This indicates inefficient prescribing practices. Appropriate drug use is essential for effective pharmaceutical care and overall healthcare. Studies have shown that irrational prescribing, often characterized by the use of non-essential drugs, can lead to adverse drug events, particularly in patients taking multiple medications[3, 20].

b. Percentage of Generic Prescriptions
The study aimed to assess the prevalence of generic prescribing among doctors. Retrospective data analysis revealed a 93.25% generic prescribing rate, aligning with the WHO's recommended range of 82-94%[11]. This finding is in contrast to previous research, which reported a lower generic prescribing rate. The discrepancy may be due to the limited availability of generic alternatives for some medications[21].

c. Prescription Dispensing Time
The Indonesian Ministry of Health mandates a maximum waiting time of 60 minutes for compounded and 30 minutes for non-compounded prescriptions[10]. A recent study at RSU X in Tomohon City found significantly shorter waiting times, averaging 8 minutes for compounded and 12 minutes for non-compounded prescriptions. This efficiency was attributed to adequate staffing and a continuous service system, even during break times. In contrast, a previous study at Siti Rahmah Islamic Hospital reported much longer waiting times, exceeding the standard by a significant margin, highlighting the impact of insufficient staffing on service delivery[22].

d. Percentage of Prescriptions Fulfilled
A retrospective analysis of prescriptions from 2023 revealed a 100% compliance rate, meeting the WHO's recommended range of 76-100%[11]. This high compliance rate is attributed to efficient drug management and procurement practices at IFRSU X in Tomohon City, which are aligned with consumption and epidemiological data. The pharmacy department's focus on patient safety[23] and satisfaction has contributed to RSU X's reputation as a preferred healthcare facility in Tomohon.

e. Percentage of Antibiotic Prescriptions
The study found an antibiotic prescribing rate of 30.2%, exceeding the WHO's recommended threshold of 22.7%. Interviews indicated that the absence of routine laboratory tests prior to antibiotic prescription contributed to this high rate, as doctors relied primarily on clinical judgment. The antibiotic prescribing indicator is a useful tool for evaluating irrational prescribing practices, as excessive antibiotic use can lead to antimicrobial resistance. In Indonesia, the overall antibiotic prescribing rate is reported to be 43%[3].

f. Percentage of Completely Labeled Medications
The 100% compliance with the WHO's 1993 standard for complete drug labeling indicates a high level of accuracy and attention to detail among pharmacy staff in preparing labels for both topical and oral medications[11]. This finding aligns with the Department of Health's 2008 guidelines, which emphasize the importance of verifying prescription accuracy, label completeness, dosage instructions, and the overall consistency of the dispensed medication with the original prescription[10].

4. CONCLUSION

The medicine management at Hospital X in Tomohon City has demonstrated some alignment with standards, such as in the distribution and procurement of medicines. However, improvements are needed in the selection stage and the use of antibiotics, as the selection has not entirely complied with *Fornas*. In addition, the prescription of antibiotics exceeds the limits recommended by WHO. Overall, the system already holds a strong foundation, but it requires improvements in several areas to enhance efficiency and compliance with standards.

5. ACKNOWLEDGMENTS

We extend our gratitude to the Ministry of Education, Culture, Research, and Technology of the Republic of Indonesia for entrusting us with the funding under the 2024 Research Program, Batch II. Main Contract No.: 071/E5PG.02.00/PM.BATCH.2/2024, and Sub-Contract No.: 1470/LL16/AL/2024.

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