

Study of Drug Planning and Inventory Control at a Primary Health Care Centre in Bandung City

Alfi Nurul Islamiyah, Oskar Skarayadi*, Muhammad Habibi Abdulchoir

Department Pharmacology-Clinical Pharmacy, Faculty of Pharmacy, Jenderal Achmad Yani University, Indonesia

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*Corresponding author

Email:

oskar.skarayadi@lecture.ujnani.ac.id

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ABSTRACT

Drug planning and inventory control are crucial aspects of drug management that effectively manage medication needs and reduce the chances of drug surplus or scarcity in the primary healthcare centre (PHC). This study focuses on detailing the process of medicine planning and inventory control at a PHC in Bandung City, West Java, Indonesia. This study utilizes a descriptive observational approach by analyzing retrospective tracing data from a 2022 medication plan, medicines use report, drug inventory reports, and the stock-taking report. Data analysis involved comparing results in the medication planning and control stages to the standard through calculations. The study revealed that the compatibility of the item with the National Formulary was 62.92%, the precision of planning was 87.91%, and the consistency of items with disease patterns was 41.51%. ITOR (Inventory Turn Over) was 2.98 times/year, and medicine availability rate was 14.88 months, out-of-stock items were 42.17%, low stock items were 0%, safety stock products were 40.43%, overstock items were 14.78%, non-prescribed-drugs were 8.62%, and expired and damaged drugs were 36.52%. The results indicated that the PHC management did not align with the drug planning and control metrics. It is crucial to improve medication management quality to meet the defined metrics efficiently.

Keywords: drug planning, inventory control, primary health care centre

INTRODUCTION

Planning needs and controlling drug supplies carried out properly by pharmacies in the primary healthcare centre (PHC) can ensure the availability of drugs, avoid problems of vacancies or excess drug stocks at the PHC, and increase the effectiveness and efficiency of health costs. Drug planning is carried out using the appropriate methodology and needs analysis and supporting data so that the validity of the planning results can approach the accuracy of the needs. Efforts to ensure drug availability are carried out by controlling drug inventory as well as mitigating if there are problems in drug availability (Kemenkes, 2019).

Drugs need planning is an activity that determines the amount and period of procurement according to the results of selection activities to ensure the fulfillment of the criteria of the right type, right amount, on time, and efficiently. Inventory control is an activity that ensures the achievement of the desired target in accordance with the analysis of needs and planning that has been determined so that there is no excess, shortage, or vacancy of drugs at the PHC (Kemenkes, 2019).

A drug management evaluation at community health centres in Pariaman City, Indonesia, showed that the accuracy of drug demand, 2.28%-24.47%,

the percentage of drugs that are not prescribed, 5.00%-23.49% and the percentage of prescribing generic drugs, 97.27% -100% this study concluded that drugs management at PHC in Pariaman is not good, because it is not accordance with established standards (Chaira et al., 2016). Another drug management evaluation in the pharmacy department of NTB Province Regional Hospital in 2017 period showed that the percentage of suitability between drug planning and the reality of each drug (120,64%), Turn Over Ratio (TOR) as much (4,01 times), percentage and value of drugs that were damaged/expired (2,8%), percentage of dead stock (4%) (Oktaviani et al., 2018). An analysis of drug planning in Class C Hospital Banyuwangi Regency, Indonesia, showed that the accuracy of planning was 70.43%, the suitability of the requested items was the planned 121.5%, and the suitability of the quantities requested was the planned 270%, indicators of planning accuracy and suitability item and number of requests is not efficient (Musyarofah et al., 2021).

Based on the problems that often arise in drug management, indicators are needed as a reference for measuring the quality of planning needs and controlling drug supplies in healthcare facilities, including PHC. Assessment of the quality of pharmaceutical preparation management at the planning and control stage at PHC can be carried out using quality indicators, which consist of conformity of items with the Indonesian National Formulary (FORNAS), conformity of items with disease patterns, the accuracy of planning, Inventory Turn Over Ratio (ITOR), level of drug availability (one month), out of stock drugs (<1 month), low stock items (1 to <12 months), safety

stock (12 - <18 months), excess stock (>18 months), non-prescribed drugs (>3 months), value of expired and damaged drugs (Cholilah et al., 2021).

Drug requirement planning and inventory control are essential components of drug management activities in PHC. These two activities play an important role in efforts to ensure drug availability. Thus, it is critical to evaluate the planning of drug requirements and inventory control to assess the effectiveness of drug management in a PHC. There is no study that investigates drug planning and inventory control in PHC and compares it to standards such as formularies. Therefore, this study was conducted to assess the management and regulation of drug requirements planning and inventory control in one of the PHCs in Bandung City, West Java, Indonesia, through the use of quality indicators so as to support the affordability of drug availability in an effective, efficient, and rational manner.

METHODS

Materials

The data about drug planning and inventory control were gathered during the period spanning from January to December 2022. This dataset encompassed various documents, including the Medicines Use Report and Request Form (LPLPO, *Laporan Pemakaian dan Lembar Permintaan Obat*), the Medication Plan (RKO, *Rencana Kebutuhan Obat*), the 2022 Drug Inventory Reports, and the Stock Taking reports.

Procedures

This study used a cross-sectional descriptive-observational design. The research was conducted at a pharmacy department in a PHC in Bandung

City, West Java, Indonesia. The study involved the participation of authorities responsible for drug planning and control. More precisely, they held the position of pharmacy installation head and were accountable for drug planning and control in PHC. The participants had previously granted their consent to take part in the study.

The research data was analyzed utilizing drug planning and control indicators derived from Satibi et al. (2019) to produce drug management analysis outcomes from the Pharmacy Installation in a PHC in Bandung City. Data analysis tabulated quantities and percentages based on drug planning and inventory control indicators. Data processing utilized and computed these indicators as a percentage of each indicator's outcome. Planning indicators encompass the adherence of drug products to the FORNAS 2022, the alignment of medication products with disease patterns, and the precision of planning. The control indications are various metrics related to inventory management. These include the Inventory Turnover Ratio (ITOR), which measures how quickly inventory is sold and replaced, typically eight to twelve times per year. The drug availability level is measured in unit months, indicating when a particular drug is available. Empty stock items refer to items that have been out of stock for less than one month, while fewer items have been out of stock for one to twelve months. Safety stock items are those that are

kept in excess to ensure availability, typically for more than 18 months. Non-prescribed drug items have a shelf life of three months.

RESULT AND DISCUSSION

Planning is carried out every certain period with the aim of bringing planning calculations closer to real needs so as to avoid vacancies and ensure drug availability (Kemenkes, 2019). Planning for the need for pharmaceutical supplies at a PHC is carried out every period by pharmacists or pharmaceutical technical personnel managing the pharmacy room. Good drug planning can prevent drug shortages or overstock and maintain drug availability in the healthcare sector (Kemenkes, 2019). Planning is carried out in accordance with pharmaceutical service standards, thus ensuring that drugs are available and used in accordance with their intended use and improving the accuracy of the estimation stage of the planning process. A planning process that is not in accordance with standards will result in problems with the validity of the results of estimates in the planning process, leading to overstocking, expired goods, or drug vacancies. The results of data processing on the suitability of drug planning at one of the Bandung City PHCs are presented in Table 1 below.

Table 1. Conformity Planning with Drug Indicator

Indicators	Result (%)	Standard (%)
Conformity Drug Item with FORNAS	62.96	100
Conformity of Drug Items with Disease Prevalence	41.51	100
Accuracy of Planning	87.91	100

The study showed that the drug planning indicators in a PHC in Bandung City were inefficient, as specific indicators did not meet the requirements as formulated in FORNAS. The National Formulary (FORNAS) is a list of selected drugs needed and used as a reference for writing prescriptions for health services in the implementation of the National Health Insurance program. There were 85 items of drugs in PHC that were in accordance with FORNAS and 135 items of medicines in PHC in Bandung City. The cause of the discrepancy is that FORNAS has not been updated, resulting in a lack of drugs listed in FORNAS. In addition, other contributing factors are medical factors related to the patient's clinical condition, where the patient cannot receive medications listed in FORNAS and non-medical factors from the doctor writing the prescription, or there is a request from the patient to prescribe drugs outside FORNAS (Arfania & Ernawati, 2020). Nevertheless, these drugs are still in the planning stage due to several factors, including benefits, therapeutic effects, and the needs of the health centre. There is a need for increased rigour and consideration in the selection of medicines in a PHC to be in accordance with FORNAS (Anggriani et al., 2020).

This study intends to evaluate the alignment between the available number of medicine types and the recommended ones for all instances in the PHC, using recognized standards as a standard. The assessment of conformity of the drug items at the PHC based on the disease prevalence in the area calculates the proportion of available medication types compared to the total number of drug types indicated for all cases at the PHC. The calculation should follow the guidelines provided in the

Minister of Health Regulation No. 5 of 2014, which specifically addresses the Clinical Practice rules for Doctors in PHC. The compatibility indicator for items showing disease patterns is based on data regarding the ten most common disease patterns in a PHC in Bandung City, West Java, in 2022. When planning, it is essential to analyze medication consumption and disease patterns to decide on the right type and amount of drugs needed to fulfil healthcare service needs (Girsang et al., 2022).

The conformance level between medicine availability and disease patterns in a PHC in Bandung City was calculated to be 62.96%, falling below the stated norms. The hindrance of advancement and introduction of new pharmaceutical options can be linked to several factors, including the ongoing reliance on specific treatments. Several essential medications specified by therapeutic guidelines are currently unavailable at the healthcare facility (Cholilah et al., 2021), for example enalapril for primary hypertension.

Planning accuracy is the proportion of planned drug items to the overall number of uses in a year. Medication planning is crucial for evaluating the effectiveness of the plan, particularly in optimizing drug utilization and encouraging reasonable drug usage. The results showed a percentage of 87.91%, compared to the standard (100%). Pharmaceutical management in the PHC is inefficient and ineffective. The results of this study did not satisfy the expected standard when compared to the set norm. Excessive planning resulted in inefficient distribution of financial resources, causing an excess of medicine supplies. Inadequate financial planning may lead to a depletion of medicine supplies (Maspekeh et al., 2018).

Inventory control is an activity that ensures the achievement of the desired target in accordance with the analysis of needs and predetermined planning so that there is no excess or shortage of drugs at the PHC (Kemenkes, 2019). Establishing control methods is the main goal of addressing drug surplus, inadequacy, or scarcity efficiently in PHC.

Studying drug control is essential because it significantly influences the overall effectiveness of PHC management. It is also crucial to avoid erroneous and illogical calculations regarding drug requirements (Baybo et al., 2022). The inventory control results are displayed in Table 2 below.

Table 2. Conformity Inventory Control with Drug Indicator

Indicators	Result	Standard
Inventory Turnover Ratio (times/year)	2.98	8-12
Drug availability rate (months)	14.88	12-18
Out-of-stock items (%)	42.17	0
Low-stock items (%)	0	0
Safety stocks (%)	40.43	100
Overstock items (%)	14.78	0
Non-prescribed drug (%)s	8.62	0
Expired drug or damaged drug values (%)	36.52	0

The Inventory Turnover Ratio (ITOR) of Bandung City's PHC was 2.98 times each year, falling within the accepted range of 8-12 times annually. A low Inventory Turnover Ratio (ITOR) figure suggests that a substantial amount of pharmaceutical inventory is still stored in facilities and awaiting distribution (Cholilah et al., 2021). The medicine availability rate at PHC in Bandung City was 14.88 months. This figure conforms to the usual timescales, but it is clear that the level of drug availability is in line with the standard. The number of drugs in the PHC meets the drug needs.

The study discovered that the value of things that were out-of-stock and low in stock resulted in an efficiency rate consecutively of 42.17% and 0%. There were reports of drug stockouts received, indicating that there are drug needs in the PHC that are not being met in accordance with the prescribed

quantities and types of drugs. The PHC ensured the distribution of drug items with various doses to prevent shortages in drug supply (Rintanantasari et al., 2021).

The results of the safety stock computation showed a value of 40.43%. The present control mechanisms for safety stock medications did not reach the 100% level. Inaccuracies throughout the planning and drug demand stages can lead to a low value (Cholilah et al., 2021). Safety stock is an important strategy to reduce stockouts caused by unpredictable lead times, inaccurate forecasting, and distributors' failure to fulfil medicine orders or deliver them in good condition (Rădăşanu, 2016). Safety stock is intended to guarantee the continuous provision of services to clients, notwithstanding uncertainties in the acquisition of goods (Baybo et al., 2022).

Furthermore, PHC had an excess inventory of 14.78%, above the anticipated indicator value of 0%. The excess supply was primarily due to the accumulation of pharmaceuticals, resulting in overstocking and eventual damage from storage and expiration. Stockpiling was the root source of this problem (Rintanantasari et al., 2021).

The non-prescription drug items had a value of 8.62%, which did not fulfil the set requirement because they contained medications that had not been prescribed for three months or more. Changes in illness patterns can result from variables such as inconsistencies in prescriptions issued by doctors in PHC (Rintanantasari et al., 2021). These fluctuations in prescribing rates can cause safety medication stockpiles to become stagnant in specific years. The drug distribution based on a PHC request was inconsistent and did not match the guidelines. Inefficient drug planning at a PHC leads to drug shortages, causing delays in drug distribution and resulting in out-of-stock medications (Caroliën et al., 2017).

The assessment of expired or damaged medications revealed a value of 36.52%, failing to satisfy the specified threshold of 0%. This figure has a substantial impact on the losses experienced in PHC. Various issues played a role, including planning errors, inadequate quality and quantity of pharmaceuticals provided by the health office or pharmacy warehouse, and failure to adhere to established norms in drug management. Expired medications are evaluated to determine the accuracy of planning and storage conditions and reduce financial losses. It is crucial to make the required improvements to prevent such situations from happening again and reduce the resulting

damages. To proactively deal with expired pharmaceuticals, a return agreement should be established between the committee and the pharmaceutical distributor. This agreement permits the return of pharmaceuticals close to their expiration date, usually a few months before, as long as the drugs are in their original state and have not deteriorated, as specified in the agreed terms (Cholilah et al., 2021).

CONCLUSION

The results indicate that the compliance of items with FORNAS was 62.96%, the precision of planning was 87.91%, and the consistency of items with illness patterns was 41.51%. ITOR had a value of 2.98 times per year, and the drug availability rate was 14.88 months, out-of-stock items were 42.17%, low stock items were 0%, safety stock items were 40.43%, overstock products were 14.78%, non-prescribed pharmaceuticals were 8.62%, and expired and damaged drugs were 36.52%. The results showed that the management of drug planning and inventory control at the PHC did not align with the medication planning and controls. It is advisable to use all drug management indicators to achieve a thorough inventory management.

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CONFLICT OF INTEREST

The author affirms that the data in this journal publication is devoid of any conflicts of interest with any relevant parties.

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