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Analysis of Pharmaceutical Supply Management in the Pharmacy Installation of Ken Saras Hospital Semarang 2024

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Abstract. *Ken Saras Hospital is a public hospital located in Semarang Regency, Central Java. This hospital is located on Jalan Soekarno-Hatta Km. 29, Bergas, Semarang Regency. Ken Saras Hospital is known as a hospital that provides comprehensive health services, with modern facilities and professional medical personnel. Ken Saras Hospital's position is included in the tiered referral hospital which often has a major impact on drug availability, such as high demand and the occurrence of drug shortages. This type of research uses a descriptive qualitative approach. This approach was chosen because the researcher wanted to understand in depth how the pharmaceutical supply management process is carried out in the Pharmacy Installation of Ken Saras Hospital Semarang, especially in the aspects of planning, procurement, and control. The hospital also has a cito purchasing system for urgent conditions. However, procurement is still reactive because it is not supported by a digitally integrated logistics information system. The existing control system has included recording usage, stock monitoring, and anticipating waiting times. The analysis results show that 22% of drug items contribute 68.42% of total consumption (group A), and 12% of items absorb 69% of the investment value.*

Keywords: *Control; Existing; System.*

1. Introduction

Health is a basic human need for a decent life and benefiting others. Hospitals are one way to maintain health (Dyahariesti & Yuswantina, 2019). According to the Indonesian Minister of Health Regulation (2020), a hospital is a health service institution that provides comprehensive individual health services, providing inpatient, outpatient, and emergency services. The existence of hospitals is inextricably linked to pharmacy. Pharmaceutical services in hospitals play a crucial role in ensuring the availability of safe, high-quality, beneficial, and affordable pharmaceutical preparations, medical devices, and consumables. Furthermore, pharmaceutical services aim to protect patients and the public from irrational drug use for patient safety. A poor drug management system will impact drug availability in hospitals. The availability of drugs that do not meet patient needs will certainly impact patient treatment and decrease the quality of hospital services.

The Hospital Pharmacy Unit (IFRS) is an integral part of healthcare services in hospitals. The

primary function of the IFRS is to implement pharmaceutical services. Pharmaceutical services in hospitals include the management of pharmaceutical supplies. According to the World Health Organization (WHO) (2017), pharmaceutical supply management is a series of steps within the pharmaceutical system aimed at ensuring the availability of safe, effective, and high-quality pharmaceutical products. The pharmaceutical supply management cycle begins with planning, procurement, receipt, storage, distribution, control, recording and reporting, disposal, monitoring, and evaluation to avoid drug waste or shortages.

The quality of hospital pharmacy management is influenced by effective planning and procurement. Hospital management aims to ensure the hospital's pharmaceutical needs are met. According to Satibi (2014), good planning and procurement management aims to optimize resource use, increase efficiency, and minimize the risk of drug shortages and waste in healthcare services.

Hospitals with inefficient drug planning can negatively impact the hospital's economy (Verawati, 2010). Effective drug planning is based on guidelines that consider budgets, remaining drugs, previous period data, drug priorities, waiting times, and development plans (Anonymous, 2016). The efficiency of drugs provided by hospitals is closely related to the drug control process. The core of management is control, ensuring that available drugs can be monitored and are safe for all drug logistics functions, and avoiding situations such as drug shortages. Hospitals with inefficient drug planning can negatively impact the hospital's economy (Verawati, 2010).

Ken Saras Hospital is a public hospital located in Semarang Regency, Central Java. The hospital is located on Jalan Soekarno-Hatta Km. 29, Bergas, Semarang Regency. Ken Saras Hospital is known as a hospital that provides comprehensive health services, with modern facilities and professional medical staff. Ken Saras Hospital's position is included in the tiered referral hospital which often has a major impact on drug availability, such as high demand and the occurrence of drug shortages. The impact of tiered referrals, high hospital visits, and the rise and fall of the BOR value affect drug management at Ken Saras Hospital. The phenomenon of gaps or drug shortages in hospitals is often caused by various factors in the pharmaceutical supply management system. Drug control carried out by Ken Saras Hospital by grouping drugs based on their shelf life is also a concern so that the procurement is according to needs and avoids shortages of chronic drugs used. This study aims to analyze the implementation of the Indonesian Minister of Health Regulation No. 72 of 2016 on the management of drug planning, procurement, and control at Ken Saras Hospital.

2. Research Methods

This research uses a descriptive qualitative approach. This approach was chosen because the researcher wanted to understand in-depth how the pharmaceutical supply management process is carried out in the Pharmacy Unit of Ken Saras Hospital, Semarang, specifically in terms of planning, procurement, and control. Qualitative research allows researchers to explore the experiences, perceptions, and practices of pharmaceutical management

implementers in a natural and authentic context. This research was conducted at the Pharmacy Unit of Ken Saras Hospital, Semarang, a general hospital in Semarang Regency, Central Java. The study period was from May to July 2025.

3. Results and Discussion

Planning is a crucial initial step in pharmaceutical inventory management. Ken Saras Hospital has implemented the consumption and morbidity method as the primary approach in determining annual drug requirements. Usage data from the previous year and patient disease patterns form the basis for estimating needs.

a. ABC Analysis Results

Drug Grouping Table with ABC Analysis Based on Usage Value for the Period January – December 2024

Group	Number of Drug Items	Percentage	Amount of Usage	Percentage
A	260	22%	562889	**68.42%**
B	389	32%	163281	**19.85%**
C	552	46%	96543	**11.73%**
Total	**1201**	**100%**	**822713**	**100%**

There were 260 fast-moving drugs in Group A, representing 68.42% of the total number of drugs used, with 562,889 drugs used. Group B had 389 drugs, representing 19.85% of the total number of drugs used. Group C had 589 drugs, representing 11.73% of the total number of drugs used.

Drug Grouping Table with ABC Analysis Based on Investment Value for the Period January – December 2024

Group	Number of Drug Items	Percentage	Investment Amount	Percentage
A	149	12%	1,932,851,568	**69%**
B	291	24%	543,285,710	**19%**
C	761	63%	329,480,630	**12%**
Total	**1201**	**100%**	**2,805,617,908**	**100%**

From the results of the ABC analysis, the investment value obtained for group A was 149 drug items.

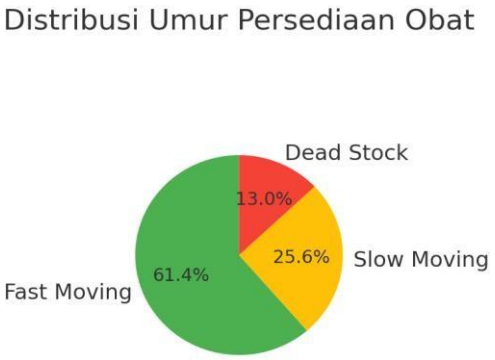
(12%) of the total items invested with an investment value of Rp. 1,932,851,568 in that period. Furthermore, in group B, 291 items (24%) were obtained from the total items with an investment amount of Rp. 543,285,710. Then for group C, there were 761 items (63%) from the total items with an investment amount of Rp. 329,480,630.

b. Drug Inventory Age Analysis

Drug inventory age analysis table

Category	Number of Items	Criteria
Fast Moving	737	**Shelf life 30–60 days**
Slow Moving	308	**Shelf life 60–365 days**
Dead Stock	**156**	**Shelf life > 365 days (not moving)**

Drug Inventory Age Analysis Chart



Based on the calculation of drug inventory age for the period January-December 2024, 737 of the total drugs used during that period were classified as fast-moving (with a shelf life of 30-60 days). 308 were classified as slow-moving, with a shelf life of more than 60 to 365 days. 156 were classified as dead stock (more than 365 days old), with no movement at all.

Research shows that pharmaceutical supply planning is the primary foundation for ensuring adequate drug availability to meet healthcare needs in hospitals. At Ken Saras Hospital, the planning process combines two primary approaches: the consumption method and the morbidity method, supported by the hospital's internal formulary. This combination of methods offers both theoretical and practical advantages in estimating drug needs.

The consumption method provides a snapshot of actual usage history based on well-documented historical data in the Pharmacy Installation. This data serves as the basis for calculating average monthly and annual usage, thereby minimizing the risk of overstocking or stock-outs. Meanwhile, the morbidity method provides an epidemiological and clinical approach. By examining patterns of disease that frequently occur in hospitals, including the number of visits and caseloads per disease type, management can estimate the types of drugs that will be needed for future treatment. This makes the planning process more oriented to

actual clinical needs and able to adapt to evolving epidemiological dynamics.

Ken Saras Hospital has also implemented a buffer stock and lead time strategy, given its geographic location in a peripheral area and far from major pharmaceutical distribution centers. This is an important precautionary measure, as the delivery process cannot rely on a one-day delivery system. With a buffer stock, the hospital has sufficient reserves to cope with sudden requests or delivery delays. Meanwhile, lead time takes into account the time between ordering and receiving the medication, which is adjusted based on previous delivery experience.

Although the planning process has been running quite well and demonstrates managerial awareness of the principles of effective logistics management, the results of this study indicate that ABC analysis has not been part of the standard operating procedures (SOP) in drug planning at Ken Saras Hospital. In fact, the ABC method is an important tool in evaluating and classifying drugs based on their contribution to consumption value or investment value to the total pharmaceutical logistics budget. In this study, it was shown that group A (priority drugs) consisted of only 22% of items, but contributed 68.42% of total consumption, and only 12% of items absorbed 69% of the investment value. This means that most of the hospital's funds were used for a handful of drugs with high frequency of use or high unit prices.

Without ABC analysis, hospitals risk allocating their pharmaceutical budget to low-priority (C) drugs, which are large in quantity but contribute little to medical services. This has the potential to lead to budget inefficiencies, particularly if funding is insufficient for Class A drugs, which are critically needed for chronic illnesses or emergencies.

In addition to ABC, VEN (Vital, Essential, Non-essential) analysis is also crucial for supporting logistics planning, particularly in clinical and therapeutic settings. With VEN analysis, hospitals can prioritize the procurement of life-saving medications (Vital) while minimizing the provision of non-urgent or clinically ineffective medications (Non-essential). The ABC-VEN combination has proven effective in managing pharmaceutical supplies in various hospitals in Indonesia and internationally, optimizing expenditures while improving service quality.

Thus, although Ken Saras Hospital's planning system is generally well-founded, routine integration of the ABC-VEN method into planning will improve the effectiveness and efficiency of pharmaceutical logistics management. Regular data-driven evaluation and clinical-economic classification will help the hospital adjust drug procurement and utilization strategies according to priorities, and avoid the occurrence of dead stock, which was identified as reaching 156 items in this study.

Procurement is a crucial process in the pharmaceutical logistics management cycle, serving as a bridge between drug planning and utilization in healthcare facilities. Successful procurement significantly impacts availability, budget efficiency, and the smooth operation of medical services. At Ken Saras Hospital, drug procurement is based on annual planning, which takes into account consumption and disease burden data, and incorporates a buffer

stock strategy to anticipate emergencies.

The main findings of this study indicate that Ken Saras Hospital's geographical location in a peripheral area, far from drug distribution centers in large cities, presents a unique challenge. This prevents one-day delivery, necessitating more strategic and proactive procurement practices. In practice, the hospital has developed a procurement plan that takes into account lead time, or the waiting time from ordering to receiving the goods. This strategy is implemented to ensure there are no stockouts of essential drugs, particularly those in group.

However, in critical situations such as sudden demand, distribution delays, or non-natural disasters, Ken Saras Hospital has an adaptive mechanism in place, namely "cito" purchasing, which is a rapid and direct purchase through collaboration with other referral hospitals or partner pharmacies. This system is a crucial force supporting the continuity of patient care, although from a cost-effective perspective, cito purchases are often more expensive and unplanned.

One significant finding in this study is the fact that group A (based on investment value) consists of only 149 items (12% of the total items), yet absorbs 69% of the total investment value of approximately Rp 1.93 billion. Medicines in this group have high strategic value, either due to their frequency of use, high price, or both. Therefore, the accuracy of procurement in this group is very crucial because even the slightest error can have a significant impact on budget efficiency and service quality.

Excessive procurement can lead to budget wastage and the risk of dead stock or expired drugs, as evidenced by the inventory age results, which showed 156 items that had not moved for more than a year. Conversely, inaccurate or delayed procurement of Group A drugs increases the risk of running out of crucial life-saving drugs, which can threaten patient safety and the hospital's reputation.

In this context, supplier selection and evaluation are crucial factors for procurement success. Ken Saras Hospital needs to collaborate with distributors with fast logistics capabilities and extensive reach. Regular evaluation of supplier performance is also crucial to assess delivery consistency, timeliness, product quality, and flexibility in emergency procurement.

Furthermore, a procurement management information system plays a crucial role. Currently, procurement at Ken Saras Hospital is not yet integrated with a real-time digital system, resulting in a reactive and manual decision-making process. This leads to low efficiency and is prone to recording errors and delayed responses to fluctuations in demand.

To strengthen its procurement system, Ken Saras Hospital needs to develop a long-term strategy based on data and ABC classification. The ABC method helps identify procurement priorities, ensuring that group A is always available and closely monitored, while groups B and C are managed rationally based on actual needs. Furthermore, the combination with VEN analysis will allow the hospital to focus on vital and essential drugs first, especially when budgets are limited.

Thus, although procurement at Ken Saras Hospital has demonstrated good flexibility and adaptability, it is still necessary to strengthen aspects of priority accuracy (with ABC-VEN), digitalization of the procurement system, and standardization of supplier evaluation so that the procurement process becomes more efficient, measurable, and resilient to the dynamics of hospital needs in the future.

Pharmaceutical inventory control is a vital element of a hospital's logistics management system, as it maintains a balance between drug availability and demand, ensuring sufficient quantities, good quality, and avoiding shortages or excesses. At Ken Saras Hospital, control measures include recording drug usage, establishing buffer stocks, and calculating lead times as a strategy to anticipate fluctuations in demand and geographic distribution challenges.

However, effective control measures are not limited to manual recording and adjusting waiting times. In this context, the use of quantitative analysis, such as the ABC method, is crucial for improving precision in drug control, particularly in identifying drug groups requiring closer monitoring. In this study, an ABC analysis was conducted based on drug consumption and investment values throughout 2024 at the Ken Saras Hospital Pharmacy Unit.

The analysis results show that in terms of consumption, group A consists of 260 items (22%), but contributes 68.42% of total drug use. Group B includes 389 items (32%) with a contribution of 19.85%, and group C consisting of 552 items (46%) only contributes 11.73%. These data confirm that group A consists of drugs that are very frequently used, either due to high disease prevalence, their use in routine therapy (such as chronic drugs), or the frequency of prescriptions by doctors.

Meanwhile, from an investment perspective, group A (149 items or 12%) absorbed 69% of the total drug procurement budget. Conversely, group C, consisting of 761 items (63%), only absorbed 12% of the budget. This disparity indicates that group A management is crucial for the efficiency and sustainability of hospital pharmaceutical logistics. Drugs in this group generally have high unit prices, high usage volumes, or both. Therefore, improper control of group A can lead to two major risks simultaneously: stock-outs, which directly impact patient care, and budget waste if stock is excessive or unused.

Optimal control should be achieved through a data-driven and prioritized approach, not simply based on service unit requests or manual estimates. In this regard, stock control of fast-moving drugs (group A) should be conducted daily or weekly, monitoring not only the physical quantity in the warehouse but also clinical usage trends and prescription patterns. Utilizing the FEFO (First Expired, First Out) system and real-time digital recording is highly recommended to minimize the risk of expiration.

In contrast, for group C, control can be conducted over a longer period of time and focused on evaluating rationalization needs, including the possibility of eliminating or reducing the number of items that are no longer relevant or rarely used. This is important to reduce

storage burden and prevent the accumulation of dead stock, which in this study was already evident in the presence of 156 medication items that had not been moved for more than a year.

Furthermore, to improve control effectiveness, Ken Saras Hospital should consider combining ABC analysis with VEN (Vital, Essential, Non-Essential) analysis. Drugs in the AV category (e.g., heart medications, insulin, certain antibiotics) should have the strictest controls, including minimum stock levels, monitoring frequency, and reordering. The CN category (expensive, non-vital, and rarely used drugs) should be re-evaluated in the formulary.

In technical implementation, an integrated, computerized pharmaceutical logistics information system is essential for faster, more accurate, and more efficient control. The use of inventory software, a daily stock monitoring dashboard, and automatic notifications when stocks approach minimum levels will help the Pharmaceutical Installation respond to needs more quickly and based on real-time data.

Thus, it can be concluded that successful pharmaceutical inventory control is not only achieved through buffer and lead time strategies, but also requires an analytical approach to prioritizing drugs based on their consumption and economic value. Without this, hospitals face a high risk of stock management, both in the form of running out of essential drugs and wasting funds due to over-procurement of non-strategic items. Therefore, the integration of the ABC method, VEN, and a digital monitoring system needs to be part of Ken Saras Hospital's future pharmacy operational policy.

Third, strengthening strategic partnerships with suppliers has the potential to improve procurement and distribution efficiency. Long-term collaborations, coupled with a commitment to quality and speed of distribution, can be a solution to addressing hospital internal resource constraints.

1) Threats

On the other hand, there are several external threats that need to be anticipated.

One of these is price fluctuations and limited supply from central suppliers. Reliance on a single supplier or national distribution center makes hospitals vulnerable to price changes, delivery delays, or product shortages.

Another threat is distribution delays due to hospitals' geographic locations, which are not always accessible by rapid distribution services. This can directly impact the availability of essential medicines, especially during times of urgent demand.

4. Conclusion

Based on the results of research on pharmaceutical supply management at the Pharmacy Unit of Ken Saras Hospital Semarang, the following conclusions can be drawn: Ken Saras Hospital has implemented consumption and morbidity methods in drug requirement planning,

supported by the hospital's internal formulary. This reflects a planning approach based on actual data and clinical needs, but the ABC-VEN method has not been routinely integrated into the process. The procurement process is carried out by considering buffer stock and lead time to avoid stockouts. The hospital also has a cito purchasing system for urgent conditions. However, procurement is still reactive because it is not supported by a digitally integrated logistics information system. The existing control system includes recording usage, stock monitoring, and anticipating waiting times. The analysis results show that 22% of drug items contribute 68.42% of total consumption (group A), and 12% of items absorb 69% of the investment value. It was found that 156 drug items were classified as dead stock, indicating the need for improved control and rationalization of use.

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