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CHALLENGES AND IMPLEMENTATION OF DRUG INVENTORY CONTROL IN HOSPITALS: LITERATURE REVIEW

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ABSTRACT

One of the most important hospital management functions is the management of pharmaceutical drug logistics. Drug planning is the process of selecting the type and quantity of drugs required for procurement. Various managerial theories can be used to analyze drug control in pharmaceutical installations, and three research journals on pharmaceutical drug logistics control in hospitals are used for this literature review. The results of the analysis show that there are four methods in drug control: EOQ (economic purchase amount), ABC (better control at all times), ROP (point of repurchase), and VEN (vital, essential, and non-essential). One way to help pharmaceutical logistics stock inventory be more efficient, efficient, and responsive to patient needs and service dynamics is to apply one or a combination of these four methods. Good drug stock management can ensure optimal inventory control, improve service quality, reduce costs, and better manage risks.

KEYWORDS ***Management, Pharmaceutical Logistics, Drug Stock Control.***

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INTRODUCTION

Improving the quality of health services in hospitals is a demand in facing the challenge of limited budget and resources. The efficient and effective use of budget and resources, solving various managerial problems. Hospitals make a priority scale for using the budget and create a more productive work environment. (Malinggas, 2015) Management or "managing" is the activity of managing various aspects to solve many things and achieve goals. (Sari, 2019) Pharmaceutical management in hospitals consists of managing the availability of pharmaceutical drugs, medical devices, and consumable medical materials that are of quality, safe, useful, effective, and efficient. Pharmaceutical drug logistics management is among the most important hospital management governance. The governance of the availability of pharmaceutical drugs starts from the selection, planning, procurement, receipt, storage, distribution, destruction and withdrawal, control, and administration needed in the pharmaceutical service process to ensure the availability of drugs in hospital health services. Inefficiencies and limitations in drug management will have a negative impact on hospital quality, both in terms of patient safety quality and in terms of hospital financial quality. (Rusli, 2016)

Drug planning is an activity to determine the type and quantity of drugs or drug selection needed for procurement. Consumption methods, epidemiological methods and combination methods can do planning. (Irawan et al., 2024) (Trianengsih et al., 2019) Procurement is obtaining supplies of medicines/pharmaceutical goods to support hospital services. Storage is the process of placing pharmaceutical supplies in a safe and qualified place. Distribution is a process that begins from the request to the delivery of medicines to health workers and patients. The drug distribution system can be carried out with a floor stock system, individual orders, combination systems and single services. (Satibi et al., 2019)

Indicators of achieving the success of efficiency and effectiveness of drug inventory control can be measured in efficiency indicators and effectiveness indicators. Efficiency indicators include 1) Planning accuracy, which is by looking at one type of drug in planning with the number of goods and types of drugs in actual use; 2) Drug adequacy, which is the number of months that shows the anticipation of the length of available drug stock; 3) Excess stock, namely drug stocks whose drug adequacy is more than 18 months; 4) TOR (*Turn Over Ratio*) is a capital turnover that occurs for 1 year; 5) Deadstock, which is the stock of drugs that have not been used for 3 months or more. The effectiveness indicator is empty stock; the final stock amount is 0 (zero) or stock out.

Drug inventory control cannot be equated with minimizing inventory, because the purpose of control is to make inventory of effective value. (Rosmania, 2015) Over-stocked drug supplies require large storage space and costs, and stored goods

are a potential stoppage of capital turnover. In addition, the availability of small stock will impact services because the inventory is stocked, reducing the quality of hospital services, especially hospital pharmacy installation services. (Solikhah et al., 2010)

Drug stock management must be well-planned as needed to support effective and efficient hospital services. Drug logistics planning plays an important role in making efforts to make hospitals effective and efficient because the accuracy of drug demand planning has an impact on hospital cost efficiency. (Dalton & Byrne, 2017) The objectives of drug stock management are 1) to minimize out-of-stock events so that they have an impact on patient services; 2) to reduce the cost of drug maintenance and storage; 3) reduce the cost of ordering drugs from distributors; 4) to ensure the most effective ordering time in drug procurement; 5) prevent waste of money due to additional spending costs and drug levels; 6) reduce drug logistics financing with the lowest budget. (Ingersoll & PharmD, 2017)

Inventory control can reduce stock inventory by up to 40%. In several studies, hospital pharmacy installation can apply several effective and efficient methods of controlling drug inventory, such as the EOQ (Economic Order Quantity) method and the MMSL (Minimum-Maximum Stock Level) method. (Dewi et al., 2020) The application of EOQ and MMSL each method showed the best efficiency for controlling stagnant stock, overstock and out-stock drugs. Both methods apply a planning pattern based on the right time to procure and purchase the required drug stock as well as for annual use. Studies have shown that EOQ can reduce drug spending budget efficiency by 17.9%, and MMSL can provide a 38.7% reduction in drug stock out. Both methods have proven to be effective in controlling drug stock inventory planning. (Indarti et al., 2019) The absence of good planning and effective control of drug supplies will ultimately reduce hospitals' profits. Meanwhile, stagnant and *overstocking* will make hospitals lose profits and revenue from the drug, in addition to the potential for the drug to expire. (Nurwahyuni, 2021)

The drug management approach through the process of planning, procurement, storage, and distribution to consumers is carried out to achieve the efficiency and effectiveness of drug stock inventory in hospital pharmacy installation.[4,15] This paper will discuss the accuracy of hospital pharmacy installation drug supplies required by hospital management to control the efficiency and effectiveness of hospital operational cost budgets.

Literature Review

(Adilya, 2024), with the results of the study ABC analysis of drugs, this study concluded that, among the three groups, group A has seven different types of drugs that account for 67% of total revenue, group B has six different types of drugs that account for 23% of total revenue, and group C has seven different types of drugs

that account for 11% of total revenue. Using the EOQ (Economic Order Quantity) method, we can see that the optimal order quantity (EOQ) varies across seven types of drugs in group A. For example, OB2 has an EOQ of 90.64 (or 90 items), while OB19 has an EOQ of 43.29 (or 43 items). For each type of drug, there are 1-4 Safety Stock, and for each type of drug, there are several units with varying amounts at the Reorder Point. (Suherman & Nurwahyuni, 2019)

(Oetari & Widodo, 2020), with the results of the study, found that the analysis of BPJS Kesehatan patients' drug control using the ABC and VEN methods is able to improve drug management to be effective and efficient, especially AE category drugs. Data on the planning, procurement and use of drugs for National Health Insurance patients in 2018 were analysed by the next EOQ method compared to the parameter values used to reduce the stock out value, but the effectiveness and efficiency of drug control were not achieved.

(Anastasia et al., 2023) with the results of the ABC method, branded generic drugs included in group A are 18 types (12%) with an investment value of 70.17% of the total investment value, group B is 22 types (14.67%) with an investment value of 20.38% of the total investment value, and group C drugs are 110 types (73.33%) with an investment value of 9.46% of the total investment value. Based on the analysis of the EOQ calculation, the optimal number of orders for group A branded generic drugs varies between 683 and 34 for each drug unit. The results of the calculation analysis using the ROP method show that the reorder point for group A branded generic drugs varies between 234-7 for each drug unit.[18 reviews]

RESEARCH METHOD

This research is a qualitative research, which is a type of research that can provide an overview in the form of a narrative report of findings from the results of interviews, field notes, various writings, or other discourses. Qualitative research uses techniques to obtain in-depth information from informants and is limited by the size of the time, place, and case being researched. (Saryono, 2010)

Information was obtained through in-depth interviews regarding drug control flow at the Mitra Siaga Hospital, Tegal, Central Java pharmacy installation. The research subjects are respondents who know the flow of services and drug control. In determining the research sample, *a purposive sampling technique* is used, which is a technique for determining the research sample with criteria that have been determined by the research first; Then, the researcher will select a person who can represent the phenomenon being studied.(Saryono, 2010) The main informant is the party that determines the drug management process and the control of drug stock inventory. In this study, the respondents who were informants were the head of the installation, the person in charge of the logistics warehouse, the person in charge of the outpatient depot, the logistics staff, and the logistics staff. Triangulation

informants are informants who function as data validity in research. Triangulation informants consist of service and support managers, financial managers, specialist doctors, and patients.

Data was collected through interviews, observations, and documentation of conditions in the field. The data collection tool uses interview guidelines. After the data is collected, its validity is verified using the triangulation technique. The data are analyzed using thematic analysis to identify patterns and themes relevant to the phenomenon being studied.

RESULT AND DISCUSSION

From the three journals that the authors analyzed, it was found that there are four types of drug stock control, namely EOQ (Economic Order Quantity), ABC (Always Better Control), ROP (Reorder Point), and VEN (vital, essential, and non-essential). Of the four methods of controlling drug stock, each has its own advantages and advantages. Economic Order Quantity (EOQ) is an inventory management method that determines the number of orders/purchases that must be made and how much must be ordered so that the total cost (the sum of the order cost and storage cost) is minimal. The EOQ method helps determine the optimal order quantity, which minimizes the total inventory cost. This includes storage costs and ordering costs, so it can save on pharmaceutical expenses. (Saputra et al., 2021)

The EOQ method has advantages and disadvantages in the stock of pharmaceutical drugs. The first advantage is that it can be used to determine how much inventory should be ordered, in this case, raw materials, and when the order should be placed. The second advantage is that it can overcome demand uncertainty with the existence of safety stock supplies. The third advantage is easy to apply to the mass production process. The fourth advantage is that it is commonly used in hospitals in drug supplies. The weakness of this method is that it places suppliers as temporary business partners because they apply the profit-loss paradigm, so the use of this model causes a change of suppliers, and this can disrupt the production process due to the company's relationship with suppliers that is not based on a close cooperative relationship. (Syakti, 2021)

ABC analysis is a useful method for rational drug selection, supply, distribution management, and promotion. ABC analysis divides existing inventories into three classifications on an annual dollar volume basis. ABC analysis is an inventory analysis of the Pareto principle. ABC analysis is an analysis that identifies the types of drugs that require the most cost or budget due to expensive use or price by grouping. (Fatimah et al., 2022)

The ABC method groups goods based on the annual consumption value. Item A (with the highest consumption value) requires more intensive managerial

attention, while items B and C require relatively less attention. This allows companies to focus on the items that have the most impact on cost and performance. The groups in the ABC analysis are divided into three, which are described as follows: (Nadhifa et al., 2022)

1. Group A, is a group of drugs that absorb 70% of the budget with the number of drugs not more than 20%. Drugs that are included in the class A group are very critical drugs, so they need to be strictly controlled and monitored continuously. Group A can place orders in small quantities, but the frequency of orders is more frequent because the investment value is large enough to potentially provide great profits for hospitals, so this group requires strict supervision and monitoring of drugs and accurate and complete recording.
2. Group B, is a group of drugs that absorb 20% of the budget with the number of drugs around 10-80%. Inventory control is not as strict as group A, but the report of its use and the rest of the drug must still be reported so that inventory control can always be controlled.
3. Class C, absorbing a budget of 10% with the amount of drugs around 10-15%. This class has more medicinal items but does not have an impact on warehouse and financial activities because the price is cheap and the use is less. Supervision and monitoring of this group can be looser.

ROP is the limit/point of the number of reorders including requests that are desired or needed during the grace period. With this ROP method, pharmacy officers can find out when it is time to reorder goods that are almost out of stock. ROP's approach has the risk of stock out if the number of requests during the lead time exceeds the amount of safety stock. The application of EOQ and ROP can improve the efficiency of hospital drug supplies. (Kencana, 2016)

Ordering drug supplies in hospitals is carried out repeatedly every month to meet needs, so it is necessary to consider safety stocks and when to order drugs again (ROP) to avoid drug vacancies. ROP occurs when the amount of inventory in stock continues to decrease, so we must determine how much the minimum limit of the inventory level must be considered so that there is no shortage of inventory. Therefore, before the supply runs out, the order must be placed. (Nguyen et al., 2022).

The VEN (Vital, Essential, Non-essential) method is a stock management technique that categorizes drugs and pharmaceutical goods based on their level of importance. By categorizing drugs into Vital, Essential, and Non-essential, companies can prioritize stock management and procurement based on their level of importance. Vital Drugs get the highest priority because they are so important for the survival of patients. The VEN analysis is used to set drug purchase priorities as well as determine safe stock levels and drug sales prices. The categories of VEN drugs are: (Wulandari & Sugiarto, 2019)

V (Vital)

They are drugs that must exist, that are needed to save lives, are included in the category of potentially life-saving drugs, have significant withdrawal side effects (must be administered regularly and the cessation is not abrupt) or are very important in the provision of health services. The criteria for the critical value of this drug are a group of drugs that are essential or vital to prolonging life, to overcome diseases that cause death or for basic health services. In this group of drugs, there should be no emptiness.

E (Essential)

They are effective medicines for reducing pain, but they are very significant for various diseases and are not vital, only for providing basic systems. The criterion for the critical value of this drug is a drug that acts causally, namely, a drug that acts on the source of the cause of the disease and that is widely used in the treatment of most diseases. The absence of this group of drugs can be tolerated for less than 48 hours.

N (Non Essential)

It is a drug used for diseases that can heal on its own and drugs whose benefits are doubtful compared to other similar drugs. The value criteria for this drug crisis are supporting drugs so that the action or treatment becomes better for comfort or to overcome complaints. The absence of this group of drugs can be tolerated for more than 48 hours.

ABC and VEN analysis in the evaluation of the drug supply plan, the hospital can find drugs that can be saved significantly so that hospital expenses due to inappropriate or excessive drug procurement can be reduced.[25] The results of this ABC VEN analysis can determine which drug procurement priorities are not in accordance with needs and budgets. Hospitals in determining and compiling drug procurement plans can be helped because the results can be known directly and easily.

CONCLUSION

Based on the results of the analysis, it can be concluded that the drug control method can be carried out in combination with all four methods simultaneously, providing a comprehensive and holistic approach to pharmaceutical inventory management in hospitals. Pharmaceutical logistics management has its own challenges, and the selection of methods is adjusted to the managerial challenges faced. Applying methods with the adjustment of the combination of these four can be one way to help pharmaceutical logistics stock inventory more effectively, efficiently, and responsively to patient needs and service dynamics. Good drug stock management can ensure optimal inventory control, improve service quality, reduce costs, and better manage risks.

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