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Evaluation of Medication Planning Management Using ABC-VEN Analysis at Hospital X Purwokerto

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ABSTRACT

***Background**: Pharmaceutical expenditures represent a significant portion of hospital budgets, underscoring the need for efficient inventory management to ensure medicine availability and avoid financial losses. **Objective**: This study aimed to evaluate the medication planning and procurement process at Hospital X using the ABC-VEN matrix to classify drugs by cost and clinical importance. **Methods**: A retrospective, descriptive study was conducted using procurement and planning records from January to December 2024. **Results:** ABC analysis revealed that 10.9% of drugs (category A) accounted for 70.13% of total spending, while 21.8% (category B) contributed 20.15%, and 67.18% (category C) represented only 9.72%. VEN classification identified 15.6% of drugs as vital, 74.22% as essential, and 10.16% as non-essential. The integrated ABC-VEN analysis categorized 20 items as Priority (P), 95 as Main (U), and 13 as Supplementary (T). **Conclusion**: The ABC-VEN approach effectively identified priority medicines, enhanced planning efficiency, and supported rational resource utilization in hospital pharmaceutical management.*

1. INTRODUCTION

Health expenditure in Indonesia increased considerably in recent years (WHO, 2025). One of the key components of healthcare is the hospital, which is a healthcare facility that provides comprehensive individual healthcare services. According to the health law, hospitals provide promotive, preventive, curative, rehabilitative, and/or palliative health services by providing inpatient, outpatient, and emergency services (UU RI, 2023). Pharmaceutical services, including drug management, play a crucial role in healthcare services in hospitals. Effective and efficient management of pharmaceutical inventory is essential for effective hospital pharmacy services. Hospital drug management encompasses stages such as selecting, planning, procurement, receiving, storage, distribution, disposal, withdrawal, control, and administration.

One of the most crucial stages is planning, which involves determining the types and estimating the quantity of drugs needed. Medication planning management is activity of determining the type and quantity of pharmaceuticals required to ensure their availability in health care activities over a given time period, following the criteria of the proper type, quantity, and timing, based on efficiency and accountability principles (Kemenkes RI, 2023b). This process is crucial for ensuring the availability of medicines in hospitals. Suboptimal planning can lead to various issues, such as unavailability of needed medicines, cost overruns, and financial losses due to stockpiling (Widyapratiwi et al., 2024).

Hospital pharmacy expenditures represent a substantial portion of overall hospital spending (Athanasakis et al., 2023). Hospitals experience losses from ineffective drug planning management, resulting in either excess inventory or a lack of essential medications for patients (Darajati et al., 2025; Yuliastri & Prasetyo, 2024). Therefore, effective drug management in hospitals is crucial to ensure the availability of essential medications while minimizing costs and losses. Various methods and strategies have been explored and implemented in various healthcare settings to optimize medication inventory management. Adequate drug supply in hospitals is crucial for ensuring the quality of hospital services. When medication planning is

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ineffective, it leads to stockouts, a situation where medication stocks run out, preventing patients from receiving their therapy. This situation not only causes financial losses for hospitals but also reduces their quality of care. Ineffective drug planning has an impact on poor drug availability, resulting in a mismatch between the types and amounts of medications and actual demands and have an impact on healthcare workforce burden, increasing patient risk, then lowering the quality of patient services (Darajati et al., 2025; Pratasik et al., 2023; Zaafira & Yardi, 2024).

The first method that can be used for drug planning control in hospitals is the Pareto method, also known as the ABC (Always, Better, Control) method. The ABC method is known as a method of grouping or classification based on the highest to lowest value rankings, which are then divided into three groups, namely A, B, and C categories (Kemenkes RI, 2016). However, the ABC method focuses solely on financial aspects, making it less suitable for drug control methods with varying medical urgencies. The second method that can be used is the VEN (Vital, Essential, Non-Essential) method. The VEN analysis aims to identify drugs that are prioritized for control, both in terms of planning and procurement, thereby enabling the classification of drugs based on their medical urgency. The combined ABC-VEN method enables hospitals to determine stock control priorities more effectively by considering both aspects of the ABC analysis (Always, Better, Control) and VEN analysis (Vital, Essential, Non-essential) to optimize drug procurement and utilization (Erowati et al., 2024; Kemenkes RI, 2016; Thazin & Sakulbumrungsil, 2022).

Hospital X is a specialised hospital located in Purwokerto, Banyumas Regency. The hospital provides outpatient and inpatient services, with the highest percentage of patients being outpatients. Supported by 43 doctors with various specialisations ranging from general practitioners to several specialised fields, the hospital serves the community in Banyumas Regency as well as patients from surrounding regencies. With a quite large number of medical staff, medication planning is less than optimal. Many medications are stockpiled and end up as dead stock or expired. The ABC-VEN study has been conducted in public hospitals in several countries such as Myanmar, Rwanda, and Indonesia (Mfizi et al., 2023; Thazin & Sakulbumrungsil, 2022; Widyapratiwi et al., 2024; Zulpadly & Nur Aulia, 2024). However, only a few specialized hospitals have conducted ABC-VEN study, including a dental specialty hospital in Bangalore, India (Gupta & Krishnappa, 2016) and a maternal and child specialty hospital in Semarang (Wulandari & Sugiarto, 2019). An evaluation of medication planning to optimise medication management has also never been conducted at X Hospital. The ABC-VEN combination approach is better to single method ABC or VEN alone, as it offers a stronger framework for decision making in hospital pharmacy management by integrating economic value (ABC) and clinical urgency (VEN), particularly in a specialised hospital with distinguished clinical urgency. Based on these considerations, this study was conducted to evaluate the drug planning and procurement process at Hospital X using the ABC-VEN method, to determine the percentage proportion of each ABC-VEN group, and the characteristics of drugs at Hospital X. It is expected that this hospital will be able to determine drug priorities to maximize the available budget, thereby improving the efficiency and effectiveness of drug management and ensuring the sustainable quality of care.

2. METHOD

This study was conducted at Hospital X in Purwokerto, Banyumas Regency, using a non-experimental research design with descriptive analysis using quantitative data. This study design was selected because this study aims to quantatively describe and evaluate medication planning using existing records without modifying any factors. The data were obtained from the hospital's drug planning and procurement records retrospectively for the period January to December 2024. All medications managed at the hospital were included in this study, except for government programme medications and vaccines, which were excluded.

Data collection involved gathering information on medication names, dosages, and formulations, the number of medication procurement plans, and the total cost of medications during the period from January to December 2024 using a total sampling approach. Qualitative data on the classification of vital, essential, and non-essential drugs were obtained from a combination of reports from the pharmacy department of Hospital X and the Essential Drug

Categories based on Ministry of Health Regulation No. 2197 of 2023 on the National Formulary. ABC analysis was conducted to group drugs based on expenditure and nominal rupiah value, while VEN analysis was conducted to group drugs based on their clinical importance. The ABC and VEN analyses were combined using a matrix to group drugs into Priority (VA, VB, VC), Main (EA, EB, EC), and Additional (NA, NB, and NC) categories to assess the effectiveness and efficiency of drug planning and procurement control. Data analysis was conducted using Microsoft Excel.

3. RESULT AND DISCUSSION

An ABC analysis was conducted on 128 drugs planned and procured from January to December 2024, including both generic and branded drugs (Table 1). From the ABC analysis, Group A comprised 14 (10.9%) drugs that accounted for 70.13% (Rp. 75,039,746.88) of total drug expenditure. Group B included 28 (21.8%) drugs, which accounted for 20.15% (Rp. 21,562,015.75) of total drug expenditure. Group C consists of 86 (67.18%) drugs, which account for 9.72% (Rp. 10,401,237.21) of the total drug expenditure in 2024 (Rp. 107,002,999.84).

Table 1. Drug Evaluation Using ABC Analysis

Group	Number of Items	Percentage of Items (%)	Purchase Cost (IDR)	Percentage of Cost (%)
A	14	10,94	75.039.746,88	70,13
B	28	21,87	21.562.015,75	20,15
C	86	67,18	10.401.237,21	10,02
Total	128	100	107.002.999,84	100

Group A is the group of drugs with the highest investment value and the lowest percentage of drug items out of all drugs planned and procured by the hospital in 2024. The results of a study in Solo showed similar results, with Group A accounting for 13.28% of drug items and 69.99% of investment value (Zulpadly & Nur Aulia, 2024). Another study by Mfizi et al. (2023) in Rwanda, the ABC evaluation results showed that 19.84% of drug items with an investment value of 74.91% were in group A, group B represented 30.29% with a value of 20% of the total cost, and group C represented 49.87% with a value of only 5.09% of the total cost. All these studies are in accordance with ABC analysis or Pareto's theory. These findings align with Kemenkes RI (2016) concerning pharmaceutical service standards in hospitals, which state that, based on the results of ABC planning evaluation in hospitals, group A is a group with a small percentage of drugs and a significant investment value. This evaluation shows that drugs in group A need to be closely monitored and controlled.

The most used types of drugs in each group A, B, and C are shown in Table 2. In group A, the most common drugs are antibiotics, local anaesthetics, NSAIDs, and antiseptics. Antibiotics are commonly used in dental procedures to treat odontogenic infections, non-odontogenic infections, local infections, focal infections, and prophylaxis (Ahmadi et al., 2021). The use of prophylactic antibiotics for dental procedures is widely practised (Vidović Juras et al., 2024). As a specialized hospital that mainly serves patients with dental procedures, it was reasonable that the most commonly used drugs in group A were antibiotics, local anaesthetics, NSAIDs, and antiseptics.

Table 2. Types of Drugs based on ABC Groups

Group	Type of Drug
A	Amoxicillin, Articaine and Epinephrine, Chlorhexidine, Potassium Diclofenac, Lidocaine and Epinephrine.

B	Triamcinolone Acetonide, Paracetamol, Vitamins B and C, Ibuprofen, Paracetamol and Tramadol
C	Naloxone, Isoflurane, Lidocaine, Paracetamol and Hyoscyamine, Methylprednisolone.

In group B, the most used drugs are painkillers, vitamins, and steroids. Meanwhile, in group C, the most used types of drugs are anaesthetics, painkillers, and steroids. From the results of this study, the drugs in group A mainly were antibiotics, local anaesthetics, NSAIDs, and antiseptics, indicating that the core services of dental hospitals, namely, drugs that support dental procedures, are the drugs that require the most significant investment in these hospitals.

The results of the planning evaluation using VEN analysis are shown in Table 3. It showed that 20 drugs (15.6%) were classified as vital drugs, 95 drugs (74.22%) were classified as essential drugs, and 13 drugs (10.16%) were classified as non-essential drugs. The essential drug groups were obtained from the national essential medicines list (OEN) in the national formulary of Minister of Health Decree number 2197 (Kemenkes RI, 2023a), and also from grouping based on clinical urgency in Hospital X.

Table 3. Drug Evaluation Using ABC Analysis

Group	Number of Items	Percentage of Items (%)
V	20	15,62
E	95	74,22
N	13	10,16
Total	128	100

From the evaluation results in the Table 3, group N only covers a small percentage, namely 10.16 percent, which means that only a small portion of the drugs in the planning and procurement are complementary. The largest percentage is essential drugs, which is 74.22 percent, which means that the selection of drugs has been carried out quite efficiently when assessed from the VEN analysis.

An ABC-VEN combination analysis was conducted to determine the priority of drug procurement in cases where drug budgeting did not match the demand (Kemenkes RI, 2016). Based on the ABC-VEN combination analysis classified in Table IV.

Table 4. Drug Evaluation Using ABC-VEN Analysis

Group	Number of Drug Items	Percentage of Drug Items (%)
VA	2	1,56
VB	2	1,56
VC	16	12,5
VA+VB+VC (Priority Category)	20	15,62
EA	11	8,59
EB	25	19,53
EC	59	46,09
EA+EB+EC (Main Category)	95	74,22
NA	1	0,78
NB	1	0,78
NC	11	8,59
NA+NB+NC (Additional Category)	13	10,16
Total	**128**	**100**

The combined results of the ABC-VEN analysis in Table 4 showed three major categories, which are Priority, Main, and Additional. The Priority category accounts for 15.62% (20 drug items) of all drugs. Within the Priority category, drugs are further classified into VA and VB, each representing 1.56% (2 drug items) of all drugs, and VC, accounting for 12.5% (16 drug items). The table indicated that most types of vital drugs fall within the VC group, characterized by low

financial investment, yet they are clinically vital. Drugs in this priority category need to be prioritised and must always be available in the hospital. The Main Category, with 74.22% (95 drug items), is the category with the largest proportion. This main category consists of EA at 8.59% (11 drug items), EB at 19.53% (25 drug items), and EC at 46.09% (59 drug items). These results are similar to a study by Norachuriya et al. (2024) that stated that the largest proportion in ABC-VEN analysis is the main category, which is 84,60% of total drug items. The Additional category, with only 10.16% (13 drug items), consists of NA and NB drugs, each accounting for 0.78% (1 drug item), and NC drugs, accounting for 8.59% (11 drug items). This additional category accounts for only a small proportion of the total number of drugs; however, drugs in the NA and NB categories, which are non-essential drugs with relatively high investment values, should be reviewed in the formulary to avoid inefficiencies in drug procurement.

Items in Group VA, VB, and VC should be prioritised in procurement and inventory systems to ensure uninterrupted access to life-saving medicines, even though their use or cost is generally low. Categories EA and EB present opportunities for financial optimisation, where prescribing practices, supplier negotiations, and therapeutic substitution policies can be aligned to control expenditure without compromising the quality of care. NC items, as part of the Additional Category, may be candidates for formulary rationalisation. Their clinical use as non-essential medications and their relatively low utilisation may indicate potential for removal or replacement, thereby enhancing the efficiency of resource planning and allocation. Meanwhile, NA items are the priority for reduction during medication planning and procurement when budgetary funds are limited.

From the ABC-VEN analysis, drugs in categories VA and EA are the most strictly controlled drugs, which must always be available in sufficient quantities at efficient prices. Meanwhile, category NA drugs, according to Minister of Health Regulation No. 72, those drugs that can be eliminated first if the budget is insufficient (Kemenkes RI, 2016). Drugs in category NA are vitamin B complex and vitamin C, which are non-essential drugs for supportive therapy. Effective implementation of ABC-VEN can improve drug availability and ensure that vital drugs are prioritised in procurement strategies (Chuiev & Shapovalova, 2022). Hospital pharmacy efficiency and efficacy can be significantly improved through routine audits and the implementation of comprehensive models such as ABC-VEN, which ultimately enhance patient care and resource utilisation. This study could improve drug planning and procurement in this hospital to maximise its budgetary resources, hence enhancing drug management efficiency and effectiveness and ensuring quality of care. Future studies should include a longer observation period and combine clinical and qualitative data to provide a more practical understanding of hospital pharmacy management.

4. CONCLUSION

The study found that group A drugs contributed 70.13% of total expenditure; 21.8% of category B drugs costing 20.15%, and 67.18% of category C drugs costing 9.72% of total drug expenditure. The VEN analysis identified 15.6% of drug items as vital, 74.22% as essential, and 10.16% as non-essential. The ABC-VEN analysis yielded 20 priority (P) category drugs, 95 main (U) category drugs, and 13 supplementary (T) category drugs. By planning and procuring medication using the ABC-VEN combination method, it is expected that the ABC-VEN method will accurately identify priority and additional medications, making drug planning and drug management in the hospital more efficient and effective, and ensuring optimal medication availability based on patient needs.

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