



Evaluation of Drug Management Using the ABC-VEN Approach and the Implementation of the Bryant Method at Prof. Dr. W. Z. Johannes Regional General Hospital in Kupang City in 2023

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ABSTRACT

This study analyzed drug management at RSUD Prof. Dr. W. Z. Johannes Kota Kupang using the ABC-VEN combination method, drug management indicator standards, and problem prioritization with the Bryant method. Using a non-experimental descriptive design with retrospective and concurrent data collection, researchers reviewed drug management documents and conducted interviews. Drug usage data from 2023 were classified using the ABC-VEN method, revealing that among 825 drug items, 162 (20%) were priority drugs, 635 (77%) were main drugs, and 28 (3%) were supplementary drugs. Evaluation against drug management indicator standards identified seven indicators that did not meet the required benchmarks. These issues were then prioritized using the Bryant method. Overall, the findings highlight key inefficiencies in drug management and identify priority areas for improvement.

INTRODUCTION

Based on the Indonesian Government Regulation Number 47 of 2021 on the Implementation of Hospital Affairs, it is stated that a hospital is a facility that provides comprehensive individual healthcare services, including inpatient, outpatient, and emergency services. The success of comprehensive medical services requires medical service standards that serve as guidelines for healthcare professionals in providing services. Pharmaceutical services are those that are directly responsible for the patient, including medications, with the aim of achieving specific outcomes to improve the patient's quality of life (Ministry of Health of the Republic of Indonesia, 2016).

Effective drug management is crucial in hospitals, involving selection, planning, procurement, receipt, storage, distribution, destruction and withdrawal, control, and administration necessary for pharmaceutical services (Malinggas et al., 2015). The goal of drug management is to ensure the effective and efficient availability of each required medication in the appropriate quantity, type, and quality whenever needed. Drug management is the process of managing and utilizing all available resources (Lilihata, 2011).

Drug management is an important part of hospital management that plays a significant role in providing public health services, as ineffectiveness and inefficiency in its management can have negative impacts on the hospital in terms of health, social, and financial aspects. Drug management is expected to run smoothly without obstacles, which is why an appropriate drug control method is needed. The combination method of ABC-VEN combines the ABC analysis method and the VEN classification method (Vital, Essential, Non-essential). This method is used with PUT analysis (Priority, Main, and Additional), where the priority drug group consists of VA, VB, and VC, the main drug group consists of EA, EB, and EC, and the additional drug group consists of NA, NB, and NC (Satibi, 2015).

The study conducted by Rofiq et al. (2020) on 'Analysis of Drug Inventory Control Using the ABC, VEN, and EOQ Methods at Bhayangkara Hospital Kediri' mentioned that the results of the drug control analysis for BPJS Health patients using the ABC and VEN methods can improve drug management to make it more effective and efficient, especially for AE category drugs. The study conducted by Rieza Zulfahmi et al. (2015) on 'Analysis of the School Dental Health Program (UKGS) at Halmahera Health Center' found that the health problem prioritization determined using the Bryant method identified the highest priority health issue as 'The implementation of UKGS activities is not yet optimal.

Based on this explanation, the researcher intends to conduct a study titled 'Evaluation of Drug Management Using the ABC-VEN Approach and the Implementation of the Bryant Method at Prof. Dr. W. Z. Johannes Regional General Hospital in Kupang City in 2023.

THEORETICAL REVIEW

Pharmaceutical Service Standards in Hospitals

According to the Minister of Health Regulation No. 72 of 2016, the regulation of pharmaceutical service standards in hospitals aims to: improve

the quality of pharmaceutical services, ensure legal certainty for pharmaceutical personnel, and protect the public and patients from the use of medications that are not aligned with patient safety.

Pharmaceutical services in hospitals are provided through a single-door system used to deliver pharmaceutical services at the hospital's pharmacy installation. In the implementation of pharmaceutical services in hospitals, satellite pharmacies may be established according to needs, which are components of the hospital's pharmacy installation (Ministry of Health of the Republic of Indonesia, 2016).

ABC-VEN Analysis

ABC analysis divides current inventory into three categories based on annual dollar volume and is very useful for selecting, providing, managing distribution, and promoting the rational use of medications. ABC analysis is an inventory analysis based on the Pareto principle. ABC analysis identifies the types of medications that require higher costs or budgets due to their usage or high prices by grouping them accordingly. This group is divided into (Ministry of Health of the Republic of Indonesia, 2019a). VEN analysis is a study used to establish priorities in drug purchasing, determine safe stock levels, and set drug selling prices. The groups of VEN drugs are (Rikomah, 2017).

ABC-VEN Combination Analysis. The ABC-VEN combination analysis is conducted to refine the analysis in drug inventory control. This combined method allows for determining the usage value of medications in accordance with their clinical demand levels. This matrix can be created in the following way (Mahdalena, 2020).

Bryant Method

In the problem-solving process, problem prioritization is very important for two reasons. First, it is not possible to solve all problems due to the limited available resources. Second, there is a relationship between one problem and another, meaning that it is not necessary to solve all problems. The problem prioritization process is used to determine how important the problem is and how likely it is to be solved (Chriswardani, 2009).

Bryant Method Parameters

The Bryant method has the following assessment parameters (Chriswardani, 2009):

- a. **Prevalence** refers to the size of the group affected by the problem. The larger the group, the higher the score given.
- b. **Seriousness** refers to the level of seriousness or urgency of the problem. The more serious the problem, the higher the score given.
- c. **Community Concern** refers to the impact of the problem on the organization. Community Concern also represents the attention or interest of the public, government, or relevant authorities toward the issue. The higher the level of importance, the higher the score given.

- d. **Manageability** refers to the availability of resources (personnel, funds, facilities, and methods/approaches) needed to address the problem. The more capable the available resources, the higher the score given.

METHODOLOGY

Research Design

This type of research is non-experimental, using a descriptive approach with retrospective and concurrent data collection methods. The research is conducted simultaneously within the same period to evaluate the drug management system at Prof. Dr. W. Z. Johannes Regional General Hospital in Kupang in 2023, using the ABC-VEN approach and the implementation of the Bryant method.

Research Process

- A. **Permission Stage.** The research permission is obtained by submitting a request to the Pharmacy Study Program at Setia Budi University, which is then forwarded to request authorization to conduct the research at Prof. Dr. W. Z. Johannes Regional General Hospital in Kupang City.
- B. **Obtaining Ethical Clearance (EC).** Ethical Clearance (EC) is a written statement from the Institutional Animal Care and Use Committee (IACUC) that affirms the research proposal is deemed ethically acceptable to proceed after meeting certain requirements.
- C. **Implementation Stage.** The implementation stage involves collecting data that is the subject of the research, specifically regarding drug management at the Pharmacy Installation of Prof. Dr. W. Z. Johannes Regional General Hospital in Kupang City, which includes:
 1. **ABC Analysis System.** The ABC analysis conducted involves grouping medications based on the drug name, the number of drug items, the percentage of the number of drug items, the drug usage value (IDR), and the percentage of drug usage value. This ABC analysis divides the medications into three groups, namely:
 - a) **Group A:** A group of medications whose planned procurement value accounts for approximately 70% of the allocated funds.
 - b) **Group B:** A group of medications whose planned procurement value accounts for approximately 20% of the allocated funds.
 - c) **Group C:** A group of medications whose planned procurement value accounts for approximately 10% of the allocated funds.
 2. **VEN Analysis System.** The VEN analysis conducted involves grouping medications based on the drug name, the number of drug items, the percentage of the number of drug items, the drug usage value (IDR), and the percentage of drug usage value. The VEN analysis system divides medications into three groups, namely:
 - a) **Group V: Vital** – This group includes medications that are life-saving
 - b) **Group E: Essential** – This group includes medications that target the source of the disease and are most needed for healthcare services.

- c) **Group N: Non-Essential** – This group includes supportive medications, which are less potent and are typically used to provide comfort or relieve mild symptoms.
- d) **ABC-VEN Analysis System.** The ABC-VEN analysis system is performed by combining ABC analysis and the VEN classification into a matrix. The combination of VEN classification and ABC provides a matrix consisting of nine categories: VA, VB, VC, EA, EB, EC, NA, NB, and NC. The ABC-VEN combination method is applied with the result of a PUT (Priority, Main, and Additional) analysis, where the priority drug groups are VA, VB, and VC, the main drug groups are EA, EB, and EC, and the additional drug groups are NA, NB, and NC.

3. Usage

- a) **Number of Drug Items per Prescription.** The purpose is to measure the degree of polypharmacy. Data are collected retrospectively from prescription samples in 2023. The total number of drug items in the prescriptions (X) is counted and compared to the number of prescriptions (Y). The calculation is done by X/Y .
- b) **Percentage of Prescriptions with Generic Drugs.** The purpose is to measure the tendency to prescribe generic drugs (Permenkes, 2010). Data are collected retrospectively from the 2023 report on generic drug prescriptions. The calculation is done by counting the number of generic drug items (X) compared to the total prescribed drug items (Y), or $X/Y \times 100\%$.
- c) **Data Management Stage.** The data are obtained from the research conducted at IFRSUD Prof. Dr. W. Z. Johannes City of Kupang: Secondary data are obtained by analyzing the efficiency of drug management at IFRS. The drug usage data from 2023 are analyzed using ABC-VEN, followed by evaluation using indicators of drug management efficiency in the stages of selection, planning, procurement, storage, distribution, and usage. Primary data are obtained by interviewing those who make policies and are responsible on the ground, including the head of IFRSUD, the head of the warehouse, and the procurement officer at the hospital. The data collected are classified into two groups: qualitative and quantitative data. Qualitative data are analyzed based on identification of findings and presented in textual form. Quantitative data are presented in tables and narratives to clarify any changes visually.

4. Bryant Method

- a) Identifying drug management problems, which include selection, planning, procurement, storage, distribution, and usage.
- b) Assigning scores (weights) based on a series of criteria: P, S, C, and M. Points are assigned on a scale from 1 to 5 through in-depth interviews with the head of the IFRS.

- c) After the series of criteria have been filled out, the total score is then calculated using the following formula:

$$\text{Formula: Total score} = P \times S \times C \times M$$

- d) The highest score is the first priority in addressing the issue.
e) Assessment for P (Prevalence), S (Seriousness), C (Community Concern), and M (Manageability).
f) Providing solutions to the drug management issues based on the priority scale

Data Analysis

The data analysis conducted in this study involves analyzing drug usage data by grouping it according to the ABC-VEN method using Microsoft Excel. After the drugs are grouped based on the ABC-VEN analysis, efficiency and effectiveness are measured using the available indicators corresponding to the stages of drug management, including selection, planning, procurement, storage, distribution, and usage, to evaluate the drug management system and obtain information regarding the extent to which the objectives of the activities have been achieved. The results are then presented in the form of a table. The calculated values will be compared with the standard values established by WHO (1993), Pudjaningsih (1996), Depkes RI (2008), Satibi (2014), and Kemenkes RI (2014). Furthermore, the qualitative data obtained from interviews will be presented descriptively, focusing on the evaluation of relevant supporting systems. After the interview results are obtained, the next step is to determine the priority of problems by assigning scores according to the existing parameters (prevalence, seriousness, community concern, and manageability) and multiplying these values.

RESULTS AND DISCUSSION

ABC-VEN Analysis

The results of the ABC-VEN analysis are as follows:

Table 1. ABC Analysis

Group	Usage Value (IDR)	% Usage Value (IDR)	Number of Items	% Number of Items
A	17,918,986,954	71	86	10
B	5,060,990,652	20	141	17
C	2,275,415,686	9	598	72
Total	25,255,393,292	100	825	100

Based on Table 1, it shows that Group A has a smaller number of drug items and percentage of drug items compared to Groups B and C; however, the drug usage value and the percentage of drug usage value are higher than those of Groups B and C. Conversely, Group C has a larger number of drug items and a higher percentage of drug items compared to Groups A and B; however, the drug usage value and percentage of drug usage value are lower than those of

Groups A and B. According to Heizer & Render (2010), drugs in Group A have a small quantity but a high investment value, requiring strict inventory control, frequent record-keeping, and more frequent inspections. Group B, with a medium investment value, also requires significant attention, though not as stringent as Group A. Meanwhile, Group C, with a low investment value, does not require as strict control compared to Groups A and B.

Table 2. Distribution of the Top 3 Types of Medications from the ABC Analysis Results

Medication Type	Usage Value (IDR)	Group
Herzemab 440 Mg	987,072,000	A
Erbitux 5 Mg / 20 Ml Inj	850,691,608	A
Octalbin 25% 100 Ml Inf	810,608,050	A
Brexel 80 Mg Inj	69,202,476	B
Imafer 400 Mg Tab	68,137,997	B
Curacil 500 Mg Inj	67,811,513	B
Fluorouracil 500 Mg Inj	18,665,328	C
D5+ 0.225% Inf	18,585,716	C
Omeprazole 20 Mg Tab	18,502,507	C

Based on Table 2, it shows that in groups A, B, and C, the types of drugs are still dominated by cancer medications, which are expensive drugs that must be available (Herzemab 440 mg, Erbitux 5 mg/20 ml Inj, Brexel 80 mg Inj, Imafer 400 mg Tab, Curacil 500 mg Inj, and Fluorouracil 500 mg Inj). This is because Prof. Dr. W. Z. Johannes Hospital in Kupang is one of the government referral hospitals for cancer in the NTT province, so these types of drugs must always be carefully monitored with proper recording and regular inspections to prevent shortages or wastage.

Table 3. ABC-VEN Analysis Matrix

	A	B	C	Total	%	
V	41	45	76	162	20	P
E	44	93	498	635	77	U
N	1	3	24	28	3	T
Total	86	142	621	825	100	

Notes:

P: Priority

U: Main

T: Additional

From Table 3, the results of the ABC-VEN matrix show that drugs in the priority category (P) account for 20% or 162 items, which are classified as vital. These drugs are critical to life, so continuous monitoring is necessary to avoid stockouts. Drugs in the main category (U) account for 77% or 635 items, which are supplied after priority drugs are met. These drugs are essential, working causally at the source of the disease and are most needed in healthcare services. Drugs in the additional category (T) account for 3% or 28 items, which are

supplied after priority and main drugs are fulfilled. Drugs in this category are classified as non-essential or supportive medications.

The categorization of drug groups may vary in each healthcare facility, as this depends on the VEN classification guidelines, regional epidemiology, and the range of healthcare services provided by the hospital in question (Satibi, 2015).

Table 4. Drug Groups with ABC-VEN Analysis

NO	Group	Value of Usage (Rp)	% of Value of Usage (Rp)	Number of Items	% of Number of Items
1	VA	9.101.355.316	36,04	41	4,97
2	VB	1.763.754.855	6,98	45	5,45
3	VC	473.476.428	1,87	76	9,21
4	EA	8.613.137.073	34,10	44	5,33
5	EB	3.177.534.113	12,58	93	11,27
6	EC	1.699.783.047	6,73	498	60,36
7	NA	204.494.565	0,81	1	0,12
8	NB	119.701.685	0,47	3	0,36
9	NC	102.156.212	0,40	24	2,91
	Total	25.255.393.292	100,00	825	100,00

Based on Table 4, it shows that as the value of drug usage increases, the number of drug items decreases, and vice versa, if the drug usage value is lower, the number of drug items increases. Hospitals need to focus on groups VA and EA because they have very high usage values (36.04% and 34.10%) as they are vital and important drugs, so they must be procured and are fast-moving, requiring regular monitoring to avoid stockouts. Group EC has a very large number of drug items used (60.36%), so it also requires monitoring to prevent wastage or accumulation of drugs.

Table 5. Highest Distribution of Drug Types from Each ABC-VEN Analysis Matrix

Drug Type	Value of Usage (Rp)	Group
Herzemab 440 Mg	987,072,000	VA
Brexel 80 Mg Inj	69,202,476	VB
Fluorouracil 500 Mg Inj	18,665,328	VC
Octalbin 25% 100 MI Inf	810,608,050	EA
Mestinon 60 Mg Tab	67,308,234	EB
D5+ 0.225% Inf	18,585,716	EC

Based on Table 5, drug usage is viewed from two aspects: the value of usage and the importance of the drug. Drugs with high usage values, such as Herzemab and Octalbin, require more attention in procurement and distribution to avoid stockouts. Meanwhile, drugs with low usage values and non-essential categories, such as Fluorouracil and Citamin D3, need to be managed more efficiently to avoid wastage or accumulation. In addition to their high cost, cancer medications are frequently used by patients undergoing

regular chemotherapy, who must visit the hospital every 1 or 3 weeks for treatment at RSUD Prof. Dr. W. Z. Johannes Kupang. The main principle in the ABC-VEN analysis is prioritizing the sustainability of services by maintaining the availability of vital medications while still considering efficiency in the procurement of less essential drugs.

The results of this ABC-VEN analysis can be used to determine which drugs should be reduced or eliminated from the hospital's procurement or supply plan according to the available budget. Drugs in the NA category should be the first to be reduced or eliminated from the procurement plan if funds are still insufficient, such as Vipalbumin, which is used for post-surgical patients to speed up the recovery process. Drugs in the NB category should be the next priority, such as Livron B Plex Tab, used as a multivitamin supplement to maintain immunity. Drugs in the NC category should be the next priority, such as Citamin D3, used to meet vitamin D needs. If, after using this approach, the available funds are still insufficient, the next step is to consider drugs from the essential group (Kemenkes RI, 2016).

Bryant Method

Based on observations and in-depth interviews conducted by the researcher with several parties involved in the drug management process at IFRSUD Prof. Dr. W. Z. Johannes Hospital in Kupang, several issues related to drug management were identified to support the hospital's services.

Table 6. Determining the Priority Scale for Problem Handling in the Drug Management System at IFRSUD Prof. Dr. W. Z. Johannes City of Kupang

Stage	Problem	Criteria			Total	Priority Problem
		P	S	S		
Planning	Allocation of drug procurement funds still below the standard	5	5	3	150	3
	Misalignment between drug planning and the actual usage	3	5	4	240	1
Procurement	Delay in hospital payment beyond the agreed time	5	5	2	100	5
	Frequency of procurement for each drug item still below the standard	3	5	3	180	2
Distribution	TOR value still below the standard	4	3	3	108	4
Usage	Number of drug items per prescription exceeding the standard	5	5	2	100	6

	Use of generic drugs still below the standard	2	2	3	36	7
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Notes:

P: Prevalence (size of the problem)

S: Seriousness (severity level)

C: Community concern (importance or attention)

M: Manageability (ability of resources to handle)

Based on Table 6, the calculation using the Bryant method resulted in 7 prioritized problems. The highest-ranked issue is the misalignment between drug planning and the actual drug usage. The lowest-ranked issue is the use of generic drugs still below the standard.

Table 7. Problems, Priorities, and Solutions in Drug Management

Stage	Problem	Root Cause	Priority Problem	Solution
Planning	Misalignment between drug planning and the actual drug usage	Additional drug requests from doctors due to new cases outside the plan	1	a. The head of the medical committee should be firm in reminding doctors. b. The hospital should collaborate with pharmacies/net work hospitals to meet drug needs.
Procurement	Frequency of procurement for each drug item still below the standard	Hospital drug procurement is done quarterly	2	a. Drug procurement should be done regularly every month to minimize stockpiling or stockouts. b. Implement ROP and EOQ methods to optimize stock management and inventory costs.
Planning	Allocation of drug procurement funds still below the standard	Procurement funds align with available hospital budget	3	a. Propose an increase in the drug procurement budget. b. Review the existing budget

				and identify potential savings in other areas to be allocated for drug procurement. c. Establish partnerships with pharmaceutical companies or donor agencies to obtain cheaper drugs.
Distribution	TOR value still below the standard	Slow drug procurement frequency due to quarterly requests	4	a. Control inventory levels with IT-based SIM support. b. Regularly analyze drug usage patterns to identify slow-moving drugs and adjust purchasing accordingly.
Procurement	Delay in hospital payments beyond the agreed time	Limited hospital cash flow	5	a. Regular communication and reminders before due dates to ensure payments are made on time. b. Implement a digital drug management system to speed up administrative processes.
Usage	Number of drug items per prescription exceeding the standard	This is a referral hospital, predominantly treating patients with multiple conditions/chronic patients	6	a. Coordinate with doctors to avoid prescribing too many drugs, which could lead to polypharmacy. b. Coordinate with doctors to write prescriptions according to

				medical indications and cost-effectiveness.
	Use of generic drugs still below the standard	Unavailability of generic drugs at distributors, resulting in substitution with branded drugs	7	Conduct regular evaluations on drug usage to monitor usage patterns and ensure branded drugs are used as little as possible.

From the weighting done with the Bryant method in Tables 25 and 26 above, the priority scale of problems and their solutions were derived through discussions with the hospital to address issues at each stage of drug management.

CONCLUSIONS AND RECOMMENDATIONS

The results of the analysis of drug management in 2023 using the ABC-VEN approach at Prof. Dr. W. Z. Johannes Regional General Hospital, Kupang City, consisting of 825 drug items, it is known that 162 drugs or around 20% are included in the Priority category, 635 drugs or around 77% are included in the main category and 28 drugs or 3% are included in the additional category.

FURTHER STUDY

1. It is recommended that relevant stakeholders prioritize issues based on the Bryant method, so that the medication management process can run more smoothly.
2. It is recommended that hospitals pay closer attention to the condition of their medication warehouses to prevent stockpiling of goods or medications.
3. It is recommended that future researchers who wish to pursue similar research incorporate all available indicators to ensure better or more complete research results.

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REFERENCES

- Abdurrahman, A., Menap, M., & Jupriadi, L. (2023). Effectiveness of the ABC and VEN Methods on Drug Planning at RSUD Praya, Central Lombok Regency in 2022. *Borneo Journal of Pharmascientech*, 7(1), 17–21. <https://doi.org/10.51817/bjp.v7i1.444>
- Aesong, N., Rismayani, B., Hulla, A. A. C., & B, H. (2021). Health Issues and Health Program Types Prioritized in the Community of Dusun V, Muntoi Village. *SEMDI UNAYA*, 1–16.

- Ahmad, U. F. N., Goni, K., Pobela, Y., Mamonto, Y. R., & Darmin. (2022). Analysis of Health Issues Priority in Muntoi Village, Bolaang Mongondow Regency. *Graha Medika Public Health Journal*, 1(1), 16–24.
- Chriswardani. (2009). *Methods of Determining Problem Prioritization*. Lecture Material on Planning and Evaluation.
- Depkes RI. (2008). *Minister of Health of the Republic of Indonesia Decree No.129/MENKES/SK XI/2008 on Pharmaceutical Services*.
- Deressa, M. B., Beressa, T. B., & Jemal, A. (2022). Analysis of Pharmaceuticals Inventory Management Using ABC-VEN Matrix Analysis in Selected Health Facilities of West Shewa Zone, Oromia Regional State, Ethiopia. *Integrated Pharmacy Research and Practice*, Volume 11, 47–59. <https://doi.org/10.2147/iprp.s354810>
- Diana, K., Kumala, A., Nurlin, N., & Tandah, M. R. (2020). Evaluation of Drug Use Based on Per (1) Indicators. *Jurnal Farmasi Dan Ilmu Kefarmasian Indonesia*, 86–88.
- Dyahariesti, N., & Yuswantina, R. (2017). Evaluation of the Effectiveness of Drug Management in Hospitals. *Media Farmasi Indonesia*, 14(1), 1–8. <http://stifar.ac.id/ojs/index.php/MFI/article/view/109/90>
- Febriawati, H. (2013). *Pharmaceutical Logistics Management in Hospitals*. Gosyen Publishing.
- Heizer, J., & Render, B. (2010). *Operations Management (9th ed.)*. Salemba Empat.
- Huemer, C., Kappel, G., Seidl, M., & Scholz, M. (2015). *UML at Classroom*. Springer Publishing.
- Irwan. (2014). *Analysis of Jamkesmas Drug Management at the Pharmacy Installation of RSUD Prof. W. Z. Johannes Kupang* (Thesis).
- Kemenkes RI. (2010). *Hospital Classification*. 116.
- Kemenkes RI. (2014). *Standard Pharmaceutical Services in Hospitals*. Directorate General of Pharmaceutical and Medical Devices, (Vol. 85, Issue 1, pp. 2071–2079).
- Kemenkes RI. (2016). *Standard Pharmaceutical Services in Hospitals* (Issue June). Directorate General of Pharmaceutical and Medical Devices.
- Kemenkes RI. (2019a). *Guidelines for the Preparation of Drug Needs Plans and Drug Inventory Control in Hospitals*. Ministry of Health of the Republic of Indonesia, 1–23.
- Kemenkes RI. (2019b). *Technical Guidelines for Pharmaceutical Services Standards in Hospitals*. Directorate General of Pharmaceutical and Medical Devices

- (Ed.), *Jurnal Sains dan Seni ITS* (Vol. 6, Issue 1). Ministry of Health of the Republic of Indonesia. <http://repositorio.unan.edu.ni/2986/1/5624.pdf>
- Komisi Akreditasi Rumah Sakit. (2024). *National Hospital Accreditation Standards*. In *Standar Nasional Akreditasi Rumah Sakit* (Vol. 15, Issue 1).
- Lilihata, R. N. (2011). *Analysis of Drug Management at the Pharmacy Installation of RSUD Masohi, Central Maluku Regency* (Doctoral Dissertation). Gadjah Mada University. https://scholar.google.com/scholar?hl=id&as_sdt=0%2C5&q=Lilihata+R.N.%2C+2011.+Analisis+Manajemen+Obat+di+Instalasi+Farmasi+Rumah+Sakit+Daerah+Masohi+Kabupaten+Maluku+Jawa+Tengah.+Jogjakarta%3A+Fakultas+Farmasi+Universitas+Gajah+Mada.&btnG=
- Listyorini, I. P. (2016). *Planning and Control of Generic Drugs Using the ABC, EOQ, and ROP Analysis Methods (Case Study in the Pharmacy Warehouse Unit of RS PKU 'Aisyiyah Boyolali)*. *Jurnal Ilmiah Rekam Medis Dan Informatika Kesehatan*, 6(2), 19–25.
- Mahdalena, S. (2020). *Evaluation of Generic Drug Planning and Control Using the Combination of ABC-VEN, EOQ, and ROP Methods at RSUD Subang*. <https://repository.bku.ac.id/xmlui/bitstream/handle/123456789/4053/Sinta%20Mahdalena.pdf?sequence=1&isAllowed=y>
- Mahdiyani, U., Wiedyaningsih, C., & Endarti, D. (2018). *Evaluation of Drug Management in Planning and Procurement Stages at RSUD Muntilan, Magelang Regency in 2015-2016*. *Jurnal Manajemen Dan Pelayanan Farmasi*, 8(1), 24–31.
- Malinggas, N. E. R., Soleman, T., & Posangi, J. (2015). *Analysis of Pharmaceutical Logistics Management at the Pharmacy Installation of RS Daerah DR Sam Ratulangi Tondano*. *Jikmu*, 5(2), 448–460. <http://ejournal.unsrat.ac.id/index.php/jikmu/article/download/7853/7904>
- Mfizi, E., Niragire, F., Bizimana, T., & Mukanyangezi, M. F. (2023). *Analysis of Pharmaceutical Inventory Management Based on ABC-VEN Analysis in Rwanda: A Case Study of Nyamagabe District*. *Journal of Pharmaceutical Policy and Practice*, 16(1), 1–6. <https://doi.org/10.1186/s40545-023-00540-5>
- Nugroho, T. (2020). *Evaluation of Drug Management and Improvement Strategy with the Hanlon Method at the Pharmacy Installation of Dr. Efram Harsana Madiun Air Force Hospital in 2020* (Thesis).
- Nugroho, T., Purwidyaningrum, I., & Harsono, S. B. (2022). *The Evaluation of Drug Management and Improvement Strategy With Hanlon Method at the Pharmacy Installation of the Air Force Hospital, Dr. Efram Harsana Madiun*. *Jurnal Manajemen Kesehatan Yayasan RS.Dr. Soetomo*, 8, 98–109.

- Presiden Republik Indonesia. (2009). *Republic of Indonesia Law No. 44 of 2009 on Hospitals* (Vol. 1).
- Presiden Republik Indonesia. (2014). *Republic of Indonesia Law No. 38 of 2014 on Nursing*. In *Presiden Republik Indonesia* (Vol. 104).
- Pudjaningsih, D. (1996). *Development of Efficiency Indicators for Drug Management at the Pharmacy Installation of Hospitals*. Thesis. Faculty of Medicine, Postgraduate Program, Master of Hospital Management, UGM.
- Putro, N. W., Herowati, R., & Widodo, G. P. (2023). *Evaluation of Drug Management and Improvement Strategies Using the Hanlon Method in the Pharmacy Installation of Ki Ageng Selo Wirosari General Hospital, Grobogan Regency, Indonesia Nugroho*. *Archives of The Medicine and Case Reports*, 4(3).
- Rieza Zulfahmi, T., Lina, R., Bedjo, S., & Tri, W. (2015). *Analysis of the School Dental Health Activity Program (UKGS) at the Halmahera Health Center*. *Jurnal Kesehatan Gigi*, 2(1), 32–37. <https://doi.org/10.31983/jkg.v2i01.1143>
- Rikomah, S. E. (2017). *Hospital Pharmacy*. Deepublish. [https://books.google.co.id/books?hl=id&lr=&id=m8dcDwAAQBAJ&oi=fnd&pg=PT194&dq=Rikomah,+S.+E.+\(2017\).+Farmasi+Rumah+Sakit.+Deepublish.&ots=rM6Hn0wfCq&sig=prlqmnIGtuEPgQoZ6vf8lkFUhYI&redir_esc=y#v=onepage&q=Rikomah%2C%20S.%20E.%20\(2017\).%20Farmasi%20Rumah%20Sakit.%20Deepublish.&f=false](https://books.google.co.id/books?hl=id&lr=&id=m8dcDwAAQBAJ&oi=fnd&pg=PT194&dq=Rikomah,+S.+E.+(2017).+Farmasi+Rumah+Sakit.+Deepublish.&ots=rM6Hn0wfCq&sig=prlqmnIGtuEPgQoZ6vf8lkFUhYI&redir_esc=y#v=onepage&q=Rikomah%2C%20S.%20E.%20(2017).%20Farmasi%20Rumah%20Sakit.%20Deepublish.&f=false)
- Rimbawati, A. (2013). *Analysis of Trends in Drug Management at the Pharmacy Installation of Sleman District General Hospital from 2009–2011* (Doctoral Dissertation, Gadjah Mada University). Gadjah Mada University.
- Rofiq, A., Oetari, O., & Widodo, G. P. (2020). *Analysis of Drug Inventory Control Using ABC, VEN, and EOQ Methods at Bhayangkara Kediri Hospital*. *JPSCR: Journal of Pharmaceutical Science and Clinical Research*, 5(2), 97. <https://doi.org/10.20961/jpscr.v5i2.38957>
- Satibi. (2014). *Drug Management in Hospitals* (First Edition). UGM-Press.
- Satibi. (2015). *Drug Management in Hospitals (Ebook)* (Gadjah Mada University Press, 1st ed.). Gadjah Mada University Press.
- Septariani, S. (2017). *Evaluation of Drug Storage Management at the Pharmacy Warehouse of Idaman Banjarbaru General Hospital*. (STIKES BORNEO LESTARI, ed.).
- Siregar, C. J. P., & Amalia, L. (2004). *Hospital Pharmacy: Theory and Application*. Buku Kedokteran EGC. <https://digilib.itb.ac.id/gdl/download/1025>
- Soraya, C., Surwanti, A., & Pribadi, F. (2022). *Drug Inventory Management Using ABC-VEN and EOQ Analysis for Improving Hospital Efficiency*. *Jurnal*

Aisyah: *Jurnal Ilmu Kesehatan*, 7(1), 373–382.
<https://doi.org/10.30604/jika.v7i1.1319>

Sugiyono. (2013). *Quantitative, Qualitative, and R&D Research Methods*. Alfabeta.

Sugiyono. (2018). *Quantitative, Qualitative, and R&D Research Methods*. Alfabeta.

Suwarto, T. K. (2011). *Evaluation of Drug Management at the Pharmacy Installation of Cilacap District Health Office in 2008, 2009, and 2010* (Thesis). Faculty of Pharmacy, Gadjah Mada University.

Wati, R. W., Achmad, F., & Pamudji, W. G. (2012). *Evaluation of Drug Management and Improvement Strategies with the Hanlon Method at the Pharmacy Installation of the Hospital in 2012*. *Jurnal Manajemen Dan Pelayanan Farmasi*, 3(4), 283–290.
<https://jurnal.ugm.ac.id/jmpf/article/view/29464>

WHO. (1993). *How to Investigate Drug Use in Health Facilities. Selected Drug Use Indicators*. *Health Policy*, 34(1). World Health Organization.
[https://doi.org/10.1016/0168-8510\(95\)90068-3](https://doi.org/10.1016/0168-8510(95)90068-3)

Widyapратиwi, R., & Soehartati, T. (2024). *Evaluation of Drug Planning and Procurement at Hospital X, South Tangerang Using the ABC-VEN Analysis Method*. 17(2), 70–79.