Original Research Paper

COMPARATIVE STUDY OF THE IMPACT OF A PANDEMIC ON ASTHMA DRUGS WITH THE PARETO ABC AND VEN METHODS FROM A PHARMACY IN SLEMAN YOGYAKARTA

Magdaleha Ohe Luon, Didiek Hardiyanto Soegiantoro[*], Sarah Puspita Atmaja

Pharmacy Department, Faculty of Pharmacy, Immanuel Christian University[1]

Email Corresponding:
didiek@ukrimuniversity.ac.id

ABSTRAK

Apotek merupakan tempat praktik kefarmasian oleh apoteker, namun juga sebagai unit bisnis yang berorientasi pada profit atau laba. Manajemen persediaan di apotek menjadi salah satu faktor penentu keberhasilan apotek mendapatkan laba usaha. Perencanaan dan pengadaan obat di apotek dilakukan dengan menggunakan analisis ABC dan VEN sehingga dapat memenuhi kebutuhan serta mengoptimalkan laba usaha. Obat asma menjadi salah satu obat penting selama pandemi COVID-19 karena salah satu gejalanya adalah sesak nafas. Permasalahan yang diteliti adalah perbandingan persediaan obat asma pada awal dan setelah pandemi COVID-19. Tujuan penelitian ini adalah untuk mengetahui dampak pandemi terhadap obat asma yang digunakan pasien. Metode yang digunakan adalah metode deskriptif kuantitatif dan kualitatif dengan menggunakan metode pareto ABC dan VEN (vital, esensial, normal). Hasil penelitian dengan metode pareto ABC didapatkan perubahan jumlah obat pada kategori A dan B pada tahun 2019 masing-masing sebanyak 6 jenis menjadi 7 jenis obat tahun 2022. Selain itu terdapat perubahan jenis obat pada pareto A dan B kecuali untuk ventolin inhaler dan ventolin nebules, sedangkan berotec MDI inhaler dan ataroc sirup bergeser kategorinya. Pola matriks ABC-VEN terdapat perubahan jumlah dan jenis obat antara tahun 2019 dan 2022 sehingga perencanaan obat asma di apotek juga harus berubah.

ABSTRACT

The pharmacy is a place for pharmacists to practice pharmacy, but also as a profit-oriented business unit. Inventory management in a pharmacy is one of the determining factors for the success of a pharmacy in obtaining operating profits. Planning and procurement of drugs in pharmacies is carried out using ABC and VEN analysis so as to meet demand and optimize operating profit. Asthma medication is one of the important medicines during the COVID-19 pandemic because one of the symptoms is shortness of breath. The problem being studied is a comparison of asthma drug supplies at the beginning and after the COVID-19 pandemic. The purpose of this study was to determine the impact of the pandemic on asthma medications used by patients. The method used is descriptive quantitative and qualitative methods using pareto ABC and VEN (vital, essential, normal) methods. The results of the study using the Pareto ABC method showed a change in the number of drugs in categories A and B in 2019 from 6 types each to 7 types of drugs in 2022. In addition, there were changes in the types of drugs in pareto A and B except for ventolin inhalers and ventolin nebules. while berotec MDI inhaler and ataroc syrup shifted their category. The ABC-VEN matrix pattern has changes in the number and types of drugs between 2019 and 2022 so that planning for asthma medications in pharmacies must also change

INTRODUCTION

Pharmaceutical services have shifted from drug-oriented to patient-oriented based on pharmaceutical care[1]. Pharmaceutical care is the responsibility of a pharmacist to provide pharmaceutical services to produce an impact on improving the quality of life of patients[2]. The role of pharmacists is expected not only to

sell drugs but rather to ensure the availability of quality drugs, that have efficacy, sufficient quantity, is safe, comfortable in use and reasonable prices, and at the time of administration accompanied by adequate information, followed by monitoring the time of drug use and the final result treatment[3].

A pharmacy as a pharmaceutical service facility that directly interacts with the surrounding community is one of the spearheads of pharmaceutical services[4]. Services with a doctor's prescription with the existence of BPJS are currently concentrated in primary-level health facilities, Puskesmas, primary clinics, and private doctor's practice so that doctor's prescriptions are no longer the first order in pharmaceutical services at pharmacies, but have shifted to self-medication[5]. Self-medication is the use of drugs for therapeutic purposes without professional advice or a prescription. Self-medication includes obtaining medicines without a prescription, buying medicines based on old prescriptions that have been received, sharing medicines with relatives or members of one's social circle, or using leftover medicines kept at home. Self-medication must be carried out according to the disease experienced. Its implementation must meet the criteria for rational drug use, including the accuracy of drug selection, drug dosage accuracy, absence of side effects, absence of contraindications, absence of drug interactions, and absence of polypharmacy[6,7,8].

Asthma is a chronic inflammatory disease of the respiratory tract with a high level of morbidity and mortality, making it a serious public health problem throughout the world[9]. The Global Initiative for Asthma (GINA) noted that in 2011 there were 300 million people in the world suffering from asthma and it is estimated that by 2025,

asthma sufferers will continue to increase to reach 400 million. In 2013, the World Health Organization (WHO) noted that as many as 235 million people worldwide suffer from asthma[10.] Asthma is included in the top 10 diseases that cause death and morbidity based on the results of the Household Health Survey (SKRT). The 2013 National Basic Health Research (RISKESDAS) Report, obtained data on the prevalence of asthma in Indonesia reaching 4.5% of the entire Indonesian population, with a high incidence rate at the age of 15 years to 44 years[11].

According to the degree of severity, asthma is classified into intermittent, mild persistent, moderate persistent, and severe persistent. In persistent asthma patients, in addition to using short-term medications for relief, they are also required to use long-term medications every day to keep asthma under control. Asthma can be controlled and treated effectively, but the level of adherence to asthma medication is still low with low adherence rates ranging from 38% to 50%. Various studies in Europe and Asia show that asthma patients often underestimate the severity of their disease, which affects the regularity of control and adherence to medication according to asthma treatment procedures. Failure to adhere to routine asthma medication will result in uncontrolled asthma causing clinical consequences such as asthma exacerbations and decreased patient quality of life[12].

Pharmacy is an inseparable part of the drug distribution chain until it reaches the patient. Pharmacy is a business area that is often considered profitable with high-profit margins and makes people interested in investing in it. The health business never seems to be empty because it is one of the most important needs of society. This is also

supported by the fact that the demand for medicines is increasing from year to year along with public awareness of the importance of health[13].

This reality then makes many investors invest in pharmacies. The number of pharmacies is increasing, but not a few are losing money due to poor management. Management or management in a pharmacy according to pharmaceutical service standards includes the management of pharmaceutical preparations and consumable medical materials which are described in the form of planning, procurement, receiving, storage, control, distribution, and destruction activities. Good management must pay attention not only to operational management, but also to strategic management, financial management, inventory management, and resource management to compete well[14].

One of the management in pharmaceutical services in pharmacies is procurement, namely activities intended for planning needs. Effective procurement must ensure availability, quantity, and the right time at an affordable price and by quality standards. Procurement is a continuous activity starting from the selection, determining the amount needed as well as the adjustment between needs and funds[15].

Drug supply management aims to establish a system that responds to actual patient needs. In analyzing the planning, the consumption pattern of pharmaceutical supplies is used which generally uses ABC or Pareto classification analysis. Using ABC analysis, you can find the things that need more attention to be controlled[16]. In this, roughly 70% of the budget was consumed by 10% of the items (Group A). Group B's next 20% of inventory items consume 20% of the financial resources, while Group C's

remaining 70% of items consume only 10% of the budget[17]. While VEN investigation (Vital, Essential, Normal) is a framework to decide the determination, obtainment, and utilization of drug supplies. Imperative meds are possibly lifesaving and are pivotal to giving fundamental well-being administrations. Essential medicines are effective against minor but serious illnesses, but they are not necessary for providing basic medical care. Minor or self-limiting illnesses are treated with standard medications[18]. The grouping of drugs given their criticality (Vital, Essential, and Normal - VEN) or cost bramble lair (Always, Better, and Control - ABC), is significant for compelling production network the board and monetary control, separately. With VEN analysis, management typically avoids stockouts and maximizes the benefits of available funds[19].

Prioritization-based evaluation of procurement patterns can be achieved by combining the ABC and VEN classification analyses. A mix of ABC and VEN examination (ABC-VEN grid) can be productively utilized to foster significant command over the material supplies. All V and E items (AV, BV, CV, AE, and AN) are included in Category I. The remaining items from the E and B groups (BE, CE, and BN) are included in Category II. The desirable and less expensive group of items is included in Category III (CN)[20].

The COVID-19 pandemic that occurred during 2020-2021 has had an impact on changing patterns of asthma drug consumption in almost all types. The problem formulated in this study is whether there is a change in the pattern of consumption of asthma medication which is analyzed using the Pareto or ABC method and using VEN analysis from a pharmacy located in Sleman

Regency, Special Region of Yogyakarta. This study aims to compare the consumption pattern of asthma medication at a pharmacy in Sleman Regency, Yogyakarta Special Region, before (2019) and after (2022) the COVID-19 pandemic. The benefits derived from this research for pharmacy management are to provide information on changes in consumption patterns so that they can be used for changes in planning for future procurement of asthma medications.

METHODS

The research design used in this research is quantitative research with an analytic descriptive observational design. This study aims to analyze the procurement of asthma drugs. The research objective used data from a pharmacy located in Kalasan District, Sleman Regency, Yogyakarta Special Region. The reason for choosing this sample was the characteristics of the pharmacies which mostly serve self-medication patients with asthma.

Data collection was carried out in January 2023 by withdrawing 2019 data as pre-pandemic data and 2022 data as post-pandemic data. Types of drugs used according to pharmacotherapy classification as asthma drugs. The data collection technique was to collect data on initial stock, number of purchases, number of sales, number of returns, and ending stock of each asthma drug during 2019 and 2022. The exclusion criteria in this study were asthma drugs purchased using a doctor's prescription.

The structured abstraction tool was well-designed to guarantee the quality of the data. Throughout the data collection, analysis, and interpretation processes, the extracted data were examined for completeness and consistency. The proportion of systematic variation in the scale was calculated by

determining the association between the scores obtained from various administrations of the scale and the scale yielded consistent results, indicating that it was reliable. This was how the scale's reliability was determined.

Utilizing an Excel spreadsheet for data analysis. The amount of all bought things were placed, the level of the complete worth was determined, and things were improved in slipping request by esteem beginning at the top with higher worth. Following that, the cumulative percentage by value and items were calculated, and the Pareto principle was used to establish cutoff points or boundaries for drugs A, B, and C. The ABC-VEN matrix was completed in the end.

RESULT AND DISCUSSION

The results of the ABC analysis of asthma drug consumption in 2019 compared to 2022 from a pharmacy located in Sleman Regency, Special Region of Yogyakarta, are listed in Table 1.

Table 1. Pareto ABC Analysis

	Number of drug items	% number of drug items	Drug sales value	% selling value of the drug
2019				
A	6	18,8%	57.980.242	70,59%
B	6	18,8%	20.463.068	19,11%
C	20	62,4%	3.695.894	10,30%
2022				
A	7	20,6%	91.333.529	70.26%
B	7	20,6%	31.598.085	19,80%
C	20	58,8%	7.061.175	9,94%

Based on a comparison of the ABC Pareto results of asthma medication at one of these pharmacies in 2019 and 2022, there will be an additional number of category A and B drugs in 2022.

The number of drug items in categories A and B is the same as the percentage of 18.8% in 2019 and 20.6% in 2022. The percentage of category A products that should be 10% of the total drug items with a sales value of 70%[17]. It turned out that in this study the percentage reached more and was the same as category B. These data indicate that the distribution of category A asthma drugs were not focused on only 10% of drug items. The positive side of this is that there is still an opportunity to divert the type of category A asthma medication if there is a stock shortage or a delay in an order. The percentage of category B drugs complies with the ABC Pareto rule of 20% with a sales value of 20%, while the number of category C drug items is less than 70%.

The sales value of asthma drugs in 2019 totaled IDR 82,139,204 while in 2022 it increased to IDR 129,992,789. The increase in sales value was caused by several factors, including the increase in the selling price of drugs, the increase in sales volume (number of units), and the increase in the types of drugs.

Table 2. Comparison of 2019 and 2022 Sales

	2019	2022
Number of drugs	32 drugs	34 drugs
Sales Volume	19.990 unit	17.658 unit
Sales Value	IDR 82.139.204	IDR 129.992.789

This research shows an increase in 2 types of drugs in 2022 compared to 2019. Meanwhile, the sales volume of drug units in 2022 was 17,658 less than in 2019 of 19,990 units. Based on an analysis of the number of units sold and the number of drugs, it can be stated that the increase in sales value in 2022 is caused by an increase in the selling price of drugs.

Based on an analysis of sales volume, there was a decrease in the number of units sold from 19,990 units (2019) to 17,658 units (2022), which indirectly indicated a decrease in the number of sales of asthma drugs at these pharmacies. Meanwhile, the sales value of asthma drugs saw a selling price increase of 58.3% from 2019 to 2022. A price increase of this magnitude was one of the reasons for the decline in sales. For information, the pharmacy where this research was conducted was a pharmacy that did not cooperate with BPJS, therefore one of the possibilities that caused the decrease in sales volume was that patients switched to using BPJS facilities due to the increasing price of asthma medicines. However, due to the COVID-19 pandemic, patients will switch to making purchases at the hospital.

Table 3. ABC-VEN Matrix

	A	B	C
2019			
Vital	2 (VA)	1 (VB)	1 (VC)
Essential	1 (EA)	3 (EB)	14 (EC)
Normal	3 (NA)	2 (NB)	5 (NC)
2022			
Vital	1	1	1
Essential	2	0	18
Normal	4	6	1

In data Table 3 there is a change in the number of drugs in all categories of the ABC-VEN matrix from data on sales of asthma drugs at one of the pharmacies in Sleman Regency, Yogyakarta. Changes in the drugs in the matrix were caused by the selection of different drugs after the COVID-19 pandemic which was following the guidelines for the management of comorbid asthma in patients infected with COVID-19. In addition, when purchasing drugs using the self-medication method, there is a change in the type of drug after an increase in drug prices.

Table 4. VA-EA and VB-EB 2019 vs 2022

	A	B
V	2019 1. Ventolin inhaler 2. Berotec MDI inhaler	2019 1. Velutine inhaler
	2022 1. Ventolin inhaler	2022 1. Berotec inhaler
E	2019 1. Ventolin nebules	2019 1. Ataroc syrup 2. Combivent nebules 3. Neo Napacin
	2022 1. Ventolin nebules 2. Ataroc syrup	2022 -

The pattern of use of asthma medication after the COVID-19 pandemic at a pharmacy in Sleman Yogyakarta has shifted except for the Ventolin inhaler and Ventolin nebules. The two drugs are still in the VA (Ventolin inhaler) and EA (Ventolin nebules) quadrants, proving that patient use of the two drugs remains the same and is not affected by the COVID-19 pandemic. This is very possible because Ventolin inhalers and Ventolin nebules are widely used in self-medication so doctors' prescription patterns for asthma medications do not affect sales volume. Changes in the selling price of Ventolin inhalers from IDR 111,306 (2019) to IDR 130,502 (2022) and Ventolin nebules from IDR 11,362 (2019) to IDR 12,873 (2022) did not affect patients' interest in using the two drugs. In fact, in terms of sales units, there was an increase in the number of sales of Ventolin inhalers from 200 units (2019) to 222 units (2022) while Ventolin nebules from 1,251 units (2019) to 2,065 units (2022).

Berotec MDI inhalers have experienced a Pareto shift from Category A (2019) to Category B (2022). Based on the results of an analysis of the number of sales, there was an increase of 3 units from 19 units (2019) to 22 units (2022) but not as much as an increase in Ventolin inhalers (22 units) so

that the total sales value of Berotec MDI inhalers decreased compared to ventolin inhalers. Nonetheless, the Berotec MDI inhaler remains an important consideration given its position in the VB quadrant.

In the essential drugs category, there was a Pareto change from Ataroc syrup, which was previously in category B (2019) to category A (2022). Based on an analysis of sales data for 2019 and 2022, there was an increase in the number of units sold from 70 units (2019) to 138 units (2022). This sales volume indirectly shows an increase in the number of pediatric patients suffering from asthma, because Ataroc Syrup is generally used for children.

CONCLUSION

The COVID-19 pandemic has caused a change in patient purchasing patterns for asthma medication at a pharmacy in Sleman Regency, Yogyakarta. Based on the analysis for 2019 and 2022, there will be an additional number of drugs followed by an increase in the selling price of the drugs, thus changing the composition of the Pareto ABC from 6-6-20 units (2019) to 7-7-20 units (2022). There were changes in the types of drugs in Pareto A and B except for ventolin inhalers and ventolin nebules, while the categories of berotec MDI inhalers and ataroc syrup shifted.

REFERENCES

1. Paudi CAO, Syamsi N, Nayoan CR, Tanra AAM. Hubungan Persepsi Masyarakat Dengan Perilaku Swamedikasi Profilaksis Covid-19 Dengan (Pendekatan Health Belief Model). *Healthy Tadulako Journal (Jurnal Kesehatan Tadulako)*. 2023;9(1):73-80. doi:10.22487/htj.v9i1.690
2. Lorensia A, Yudiarso A, Safina N. Persepsi Apoteker terhadap Hambatan dalam Pelayanan Kefarmasian Penyakit

Asma Di Apotek: Pharmacist Perception of Barriers in Pharmaceutical Services for Asthma Disease in Pharmacies. *J Sains Kes*. 2020;2(4):246-258. doi:10.25026/jsk.v2i4.127

3. Setyaningrum N, Gredynadita V, Gartina S. Penggunaan Obat Off-Label pada Anak di Apotek Kota Yogyakarta. *Jurnal Sains Farmasi & Klinis*. 2017;4(1):30-35. doi:10.29208/jsfk.2017.4.1.169

4. Kemenkes R.I. Permenkes 73 2016 Standar Pelayanan Kefarmasian di Apotek | Direktorat Jenderal Kefarmasian dan Alat Kesehatan. Published 2016. Accessed December 5, 2022. https://farmalkes.kemkes.go.id/unduh/per menkes732016standar-pelayanan-kefarmasian-di-apotek/

5. Fadlilah ZN. Gambaran Tingkat Pengetahuan Tentang Swamedikasi pada Masyarakat di Kelurahan Baciro dan Kelurahan Terban Yogyakarta. Published online January 21, 2021. Accessed September 6, 2022. https://dspace.uii.ac.id/handle/123456789/29118

6. Dewi VC, Queljoe D de, Aditama L. Persepsi Pasien terhadap Pelayanan Swamedikasi oleh Apoteker di Beberapa Apotik Wilayah Sidoarjo. *CALYPTRA*. 2016;4(2):1-15.

7. Hidayati A, Dania H, Puspitasari MD. Tingkat Pengetahuan Penggunaan Obat Bebas dan Obat Bebas Terbatas untuk Swamedikasi pada Masyarakat RW 8 Morobangun Jogotirto Berbah Sleman Yogyakarta. *Jurnal Ilmiah Manuntung*. 2017;3(2):139-149. doi:10.51352/jim.v3i2.120

8. Mirawati N, Rusmana WE. Evaluasi Pelayanan Komunikasi, Informasi dan Edukasi Swamedikasi Obat Terhadap Pasien di Apotek Cicaheum Farma Kota Bandung. *cerdika*. 2022;2(2):199-205. doi:10.36418/cerdika.v2i2.310

9. Hs MR. Asma Dan Sindrom Metabolik. *Healthy Tadulako Journal (Jurnal Kesehatan Tadulako)*. 2018;4(3):11-22. doi:10.22487/htj.v4i3.78

10. Haryanti S, Ikawati Z, Andayani TM, Mustofa M. Hubungan Kepatuhan Menggunakan Obat Inhaler β2-Agonis dan Kontrol Asma pada Pasien Asma. *Indonesian Journal of Clinical Pharmacy*. 2016;5(4):238-248. doi:10.15416/ijcp.2016.5.4.238

11. Lutfiyati H, Ikawati Z, Wiedyaningsih C. Efek Samping Penggunaan Terapi Oral Pada Pasien Asma. *1*. 2015;1(1):21-28. doi:10.31603/pharmacy.v1i1.64

12. Arifuddin A, Rau MJ, Hardiyanti N. Faktor-Faktor Yang Berhubungan Dengan Kejadian Asma Di Wilayah Kerja Puskesmas Singgani Kota Palu. *Healthy Tadulako Journal (Jurnal Kesehatan Tadulako)*. 2019;5(1):13-18. doi:10.22487/htj.v5i1.107

13. Ismaya NA, Pratiwi RD, Indah FPS, Aulia G, Sumarwati S. Pola Pengadaan Obat di 4 Apotek Jaringan Wilayah Bumi Serpong Damai (BSD) Tangerang Selatan. *Jurnal Kefarmasian Indonesia*. Published online February 25, 2022:39-49. doi:10.22435/jki.v0i0.4937

14. Laiya AW. *Sistem Informasi Manajemen Persediaan Obat Di Apotek 17*. other. Universitas Komputer Indonesia; 2019. doi:10/14.10114305_AYU%20WULAND ARI%20LAIYA_BAB%204.pdf

15. Khuriyati LI. Pengendalian Persediaan Obat Kemoterapi Melalui Pendekatan Analisis ABC Indeks Kritis di Ruang Pencampuran Instalasi Farmasi RSUP Dr. Mohammad Hoesin Palembang Tahun 2015. *Jurnal Administrasi Rumah Sakit Indonesia*. 2018;3(1). doi:10.7454/arsi.v3i1.2213

16. Darmawan NW, Peranginangin JM, Herowati R. Analisis Pengendalian Persediaan Obat BPJS Kategori A(Always) Dan E (Esensial) Dengan Menggunakan Metode ABC, VEN Dan EOQ Di IFRS Bhayangkara Tingkat III Nganjuk. *JPSCR: Journal of Pharmaceutical Science and Clinical Research*. 2021;6(1):20-32. doi:10.20961/jpscr.v6i1.38960

17. Inayah I, Alexandri B, Pragiwani M. Economic Order Quantity (EOQ) Method Analysis, ABC Classification and Vital, Essential and Non Essential (VEN) Analysis of Medicines. *Indonesian Journal of Business, Accounting and Management*. 2022;5(01):15-24. doi:10.36406/ijbam.v5i01.562

18. Mohammed SA, Workneh BD. Critical Analysis of Pharmaceuticals Inventory Management Using the ABC-VEN Matrix in Dessie Referral Hospital, Ethiopia. *Integrated Pharmacy Research and Practice*. 2020;9:113-125. doi:10.2147/IPRP.S265438

19. Soraya C, Surwanti A, Pribadi F. Drug Inventory Management Using ABC-VEN and EOQ Analysis for Improving Hospital Efficiency. *Jurnal Aisyah : Jurnal Ilmu Kesehatan*. 2022;7(1):373-382. doi:10.30604/jika.v7i1.1319

20. Alexandri MB, Pragiwani M, Inayah I. Analisis Metode Economic Order Quantity (EOQ) dan Analisis Klasifikasi ABC serta Analisis Vital, Esensial, dan Non-Esensial (VEN) terhadap Persediaan Obat. *Responsive*. 2020;3(3):131-141. doi:10.24198/responsive.v3i3.32133