


Hypertension Drug Sales Pattern in Yogyakarta Through the Tokopedia Platform

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Article Info	ABSTRACT
<p>Keywords: Tokopedia, Antihypertension drugs, Online distribution, Yogyakarta</p>	<p>Hypertension is a chronic disease with a high prevalence in Indonesia, including the Special Region of Yogyakarta (DIY), so the availability of antihypertensive drugs is crucial. This study aims to examine the sales patterns of antihypertensive drugs through the Tokopedia e-commerce platform in DIY, with a focus on variations in sales volume and types of drugs based on administrative regions and pharmacotherapy classifications. The method used was descriptive quantitative with direct observation on Tokopedia on April 29, 2025, covering five districts/cities: Yogyakarta, Sleman, Bantul, Kulon Progo, and Gunungkidul. The results showed that Sleman Regency recorded 140 boxes and Yogyakarta City recorded the highest sales of 262 boxes, while Bantul recorded 29 boxes and Gunung Kidul 2 boxes while Kulon Progo recorded no sales at all. Generic drugs dominated the sales, especially Calcium Channel Blockers (CCB) with 201 boxes and Angiotensin Receptor Blockers (ARB) with 99 boxes. Meanwhile, branded drugs were mostly found in the ACE Inhibitor group, although in total this group recorded the least number of sales. The conclusions indicate inequality in e-commerce distribution and utilization between districts/cities, as well as public preference for more affordable drugs. Therefore, strategies to equalize access and educate the use of e-commerce in drug distribution are needed, in order to support the equitable and efficient management of hypertension.</p>
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INTRODUCTION

Hypertension has emerged as a significant public health challenge in Indonesia, characterized by an alarming increase in prevalence, complications, and associated mortality. Recent studies have shown that the prevalence of hypertension among Indonesian adults aged 18 years and above has increased from approximately 26.5% in 2013 to 34.1% in 2018, with indications of a higher prevalence among women, especially those aged 60 years and above. This increase translates to approximately 63 million people suffering from hypertension, with projections indicating a mortality rate of 427,218 deaths due to this condition each year (Sirait et al., 2022; Umiatin et al., 2024).

The impact of hypertension goes beyond mere prevalence; it is a major contributor to coronary heart disease and other cardiovascular problems, which collectively account for a significant proportion of morbidity and mortality in the country (Mulyanto et al., 2024). Risk factors contributing to hypertension include lifestyle choices such as high sodium intake, lack of physical activity, and increasing rates of obesity, which may be exacerbated by socioeconomic factors that affect access to health services (Mashuri et al., 2022). Furthermore, complications from uncontrolled hypertension are serious and can lead to kidney failure, stroke, and heart disease, further burdening the health care system (Candini et al., 2023).

Hypertension management involves several therapeutic approaches, primarily pharmacotherapy, in which healthcare providers implement a gradual addition of antihypertensive agents according to established guidelines, such as those of the European Society of Cardiology and the American Heart Association (Finkelstein et al., 2014). A critical aspect of effective management depends on how physicians and patients utilize home blood pressure monitoring (HBPM)—a critical tool that, when properly integrated, helps in diagnosing and managing hypertension effectively. This is underscored by the observation that many patients do not have proper instructions for accurate HBPM prior to drug administration, which can significantly impact hypertension assessment and treatment efficacy (Hussain et al., 2016).

Antihypertensive medications include several classes, each with different mechanisms of action, benefits, and side effects. The main classes include diuretics, which increase sodium and water excretion to decrease blood volume and pressure, often serving as first-line treatment options (Ginting & Suci, 2023). Angiotensin-converting enzyme (ACE) inhibitors and angiotensin receptor blockers (ARBs) are essential in managing hypertension by blocking hormonal pathways that constrict blood vessels, thereby promoting vasodilation and reducing blood pressure (Khoe et al., 2020). Calcium channel blockers (CCBs) target vascular smooth muscle to inhibit contraction and reduce blood pressure, while beta-blockers modulate heart rate and myocardial contractility, playing a supportive role especially in patients with concomitant cardiovascular conditions (Putri et al., 2024). Careful combination of these antihypertensive therapies, especially in cases of resistant hypertension—when patients do not achieve target blood pressure despite treatment with multiple drug classes—remains critical for successful outcomes (Eff et al., 2021).

Previous studies have emphasized the need for a comprehensive strategy that includes education, access to treatment, and ongoing pharmaceutical care to improve the management of hypertensive patients in Indonesia (Eff et al., 2021; Hussain et al., 2016). This multifaceted approach recognizes the interplay between pharmacotherapy, patient adherence, and HBPM utilization as integral components to improving hypertension outcomes in resource-limited healthcare settings. Ongoing education and support for healthcare practitioners regarding the latest protocols and treatments for hypertension management is critical to optimize treatment and ensure better patient health outcomes globally, especially in regions with high prevalence rates such as Indonesia (Khoe et al., 2020).

In the rapidly developing digital era, e-commerce has become one of the main platforms in product distribution, including health products such as medicines (Lombardo et al., 2019; Ozawa et al., 2022). One phenomenon that attracts attention is the pattern of online sales of antihypertensive drugs, especially through the Tokopedia e-commerce platform in the Special Region of Yogyakarta. This study has a high urgency considering that hypertension is one of the chronic diseases with a high prevalence in Indonesia, including in Yogyakarta, so public access to antihypertensive drugs is crucial in controlling this disease (Mackey et al., 2022; Samant, 2018). With the shift in consumer behaviour from conventional to digital purchases (Long et al., 2022; Umiatin et al., 2024), it is necessary to study how the sales pattern of antihypertensive drugs—both logoed generics and branded generics—is distributed through e-commerce, as well as how the selling price varies in each district/city in Yogyakarta. The purpose of this study is to provide a comprehensive picture of the sales volume and price fluctuations of antihypertensive drugs on Tokopedia which are categorized based on administrative areas in Yogyakarta (Sleman, Bantul, Yogyakarta, Kulonprogo and Gunung Kidul). By understanding this pattern, it is hoped that the results of the study can provide input for policy makers, pharmaceutical industry players, and e-commerce platforms in increasing the accessibility and affordability of antihypertensive drugs more evenly. The problem that is the main focus of this study is how the sales volume and price variations of antihypertensive drugs—both logoed generics and branded generics—differ in each district/city in Yogyakarta. These variations can reflect differences in people's purchasing power, level of health awareness, and potential inequality in drug distribution in the digital realm. Therefore, this study is important not only in an academic context, but also as a basis for efforts to improve a fairer and more efficient drug distribution system through digital platforms.

METHODS

The research design is quantitative descriptive. Descriptive research aims to describe or describe the situation objectively. Quantitative data is obtained from the number of products sold. The research variables to be studied are the number of sales, the region or location of the pharmacy based on the division of districts/cities, the classification of antihypertensive groups, and the category of generic drugs with logos and patents or branded generics. Data was taken on April 29, 2025 to avoid bias in research data because the transaction process cannot be controlled so that it can increase the number of products sold.

Table 1. Sampling design

Inclusion	Exclusion
1. Hypertension drugs sold on e-commerce	1. Hypertension drugs sold on platforms other than Tokopedia
2. Hypertension drugs from the ARB, CCB, diuretic, beta blocker, Ace-inhibitor groups	2. Hypertension drugs other than ARB, CCB, Diuretic, beta blocker, Ace-inhibitor groups
3. Sales of hypertension drugs in the Yogyakarta province.	3. Sales of hypertension drugs in Yogyakarta province outside of Sleman, Bantul, Yogyakarta, Kulonprogo and Gunung Kidul.

The data source is a primary data source, namely direct observation on the Tokopedia platform. Quantitative data is obtained by calculating the number of sales by separating the location or seller area variables according to the district/city in the province of the Special Region of Yogyakarta, separating between generic drugs with logos and patented drugs or branded generics.

Data analysis uses data tables and graphs by comparing the sales patterns of antihypertensive drugs in each district/city in the province of the Yogyakarta province, as well as observing the types of drugs in the form of generic drugs and patented drugs or branded generics.

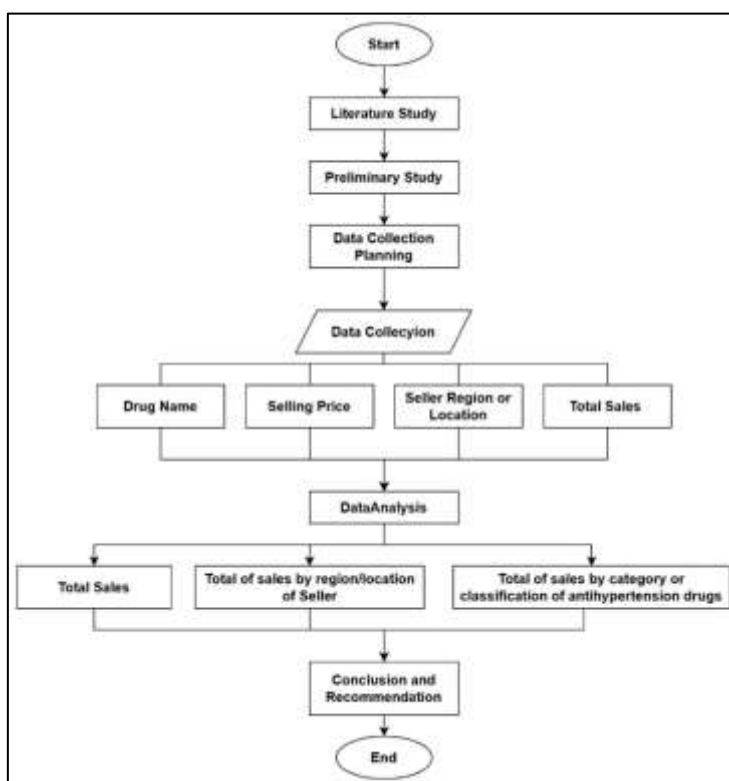


Figure 1. Research Flow Chart

RESULTS AND DISCUSSION

Sales recorded on the Tokopedia platform cannot detect when the pharmacy started joining Tokopedia, so the data collected is real-time data that potentially did not start at the same time.

Table 1. Total sales based on region or location in the Yogyakarta province

Region or Location of Pharmacy in Tokopedia					Total Sales (In box unit)
Slaman	Bantul	Kulon Progo	Gunung Kidul	Yogyakarta City	
140 box	29 box	0	2 box	262 box	433 box

Table 2. Detail sales of antihypertension drug based on region or location in the Yogyakarta province

District	Drug Name	Contents per box	Generic	Brand Name	Total Sales (in box)	Total blister or strip
Sleman	Candesartan (dexa)	3 strip	Generic	X	21 box	63 strip
	Candesartan (novell)	3 strip	cGene	X	7 box	21 strip
	Furosemid (yarindo)	10 strip	ericGen	X	12 box	120 strip
	Amlodipine (pharmalaboratories)	3 strip	ericGen	X	3 box	9 strip
	Amlodipine (hexpharm)	10 strip	eneric	X	17 box	170 strip
	Amlodipine (novell)	10 strip	eneric	X	33 box	99 strip
	Amlodipine (dexa)	3 strip	Generic	X	3 box	9 strip
	Bisoprolol (dexa)	3 strip	cGene	X	16 box	48 strip
	Bisoprolol (novell)	3 strip	ericGen	X	2 box	20 strip
	Bisoprolol (novell)	3 strip	ericGen	X	2 box	20 strip
	Captopril (kimia farma)	10 strip	eneric	Brand	5 box	15 strip
	Norvask (Pfizer)	10 strip	eneric	d	1 box	3 strip
	Tensivask (dexa)	10 strip	X	Brand	18 box	180 strip
Concor (merck)	3 strip	X	d			
	3 strip		Brand			
	10 strip		d			
Bantul	Candesartan (dexa)	3 strip	Generic	X	13 box	39 strip
	Amlodipine (hexpharm)	3 strip	cGene	X	3 box	9 strip
	Amlodipine (pharos)	3 strip	ericGen	X	6 box	18 strip
	Bisoprolol (hexpharm)	10 strip	ericGen	X	6 box	60 strip
	Captopril (kimia farma)	10 strip	eneric	X	1 box	10 strip
Yogyakarta City	Candesartan (dexa)	3 strip	Generic	X	48 box	144 strip
	Furosemid (kimia farma)	20 strip	c	X	28 box	560 strip
	Amlodipine (sampharindo)	10 strip	Generic	X	126 box	1.260 strip
	Amlodipine (pharos)	10 strip	c	X	16 box	160 strip
	Amlodipine (pharos)	3 strip	Generic	X	35 box	48 strip
	Bisoprolol (dexa)	3 strip	c	X	2 box	105 strip
	Captopril (dexa)	3 strip	Generic	X	6 box	20 strip
	Captopril (kimia farma)	10 strip	c	Brand	1 box	60 strip
Concor (merck)	10 strip	Generic	d		10 strip	
			cGene			

		10 strip	ricGen ericX			
		10 strip				
Gunung Kidul	Candesartan (dexa)	3 strip	Generi c	X	2 box	6 strip
Kulon Progo						

Distribution of antihypertensive drug sales through the Tokopedia e-commerce platform in the Special Region of Yogyakarta (DIY), especially in the areas of Sleman, Bantul, Yogyakarta, Kulon Progo and Gunung Kidul. Shown in table 1. Sleman Regency recorded the highest number of sales of 140 boxes, followed by Yogyakarta City with 262 boxes, these two areas contributed almost the entire recorded sales volume, which was 402 boxes out of a total of 433 boxes. This shows a high concentration of antihypertensive drug sales in areas with dense population and more intensive economic activity, such as developing areas and the outskirts of large cities. Other areas in DIY such as Bantul, Kulon Progo, and Gunung Kidul Regencies showed much lower sales figures. Bantul Regency only recorded 29 boxes, while Kulon Progo and Gunung Kidul each only sold 0 and 2 boxes of sales.

This difference may reflect several factors, such as lower or rarely used internet penetration rates and e-commerce usage in rural areas (Hussain et al., 2016), limited access to digital pharmacy services, and people's habits in purchasing drugs that tend to be conventional in several districts or are still accustomed to buying drugs directly. In general, it can be said that this sales pattern shows that the choice of e-commerce in purchasing antihypertensive drugs is still not evenly distributed throughout the Special Region of Yogyakarta. The concentration of sales in Sleman and Yogyakarta City may also reflect the high public awareness of managing chronic diseases such as hypertension, as well as the availability and trust in online pharmacy services in the area. Therefore, to encourage equal access and utilization of e-commerce in the pharmaceutical sector, a strategy is needed that leads to digital education, infrastructure improvement, and collaboration with local health service providers in areas with low sales figures (Candini et al., 2023).

Table 3. Antihypertension drug sales based on pharmacotherapy class

Pharmacotherapy class of antihypertension drugs	Generic (in box unit)	Brand Name (in box unit)
ARB (Angiotensin Receptor Blocker)	99 box	0
Diuretics	40 box	0
CCB (calcium channel blocker)	201 box	6 box
Beta-Blocker	57 box	19 box
ACE Inhibitor	11 box	0
	408 box	25 box

Based on Tables 2 and 3, it can be analyzed that there are significant variations in the use of various classes of antihypertensive drugs on the e-commerce platform. Tokopedia for the Yogyakarta province (Sleman, Bantul, Yogyakarta, Kulonprogo and Gunung Kidul). From a pharmacotherapy perspective, the most sold drug group is CCB (Calcium Channel Blocker) with a total of 207 boxes of sales, consisting of 201 boxes of generic drugs and 6 boxes of branded drugs, followed by ARB (Angiotensin Receptor Blocker) as many as 99 boxes of sales, all of which are generic drugs only. This shows that the preference of the community in this area tends towards treatment with CCB (Calcium Channel Blocker) and ARB (Angiotensin Receptor Blocker), which is in accordance with the pharmacotherapy guidelines for the management of hypertension, where CCB (Calcium Channel Blocker) and ARB (Angiotensin Receptor Blocker) are often the first-line choices, especially in elderly patients or those with certain comorbidities such as diabetes (Candini et al., 2023). However, when compared to the hypertension management model initiated by the government through the National Medical Service Guidelines (PNPK) and the JKN protocol, the use of ACE Inhibitors should be one of the first-line therapies. Interestingly, in this data, ACE Inhibitors actually have fewer total sales in generic drugs, only 11 boxes sold, while branded generic drugs did not sell well in the Yogyakarta province (Sleman, Bantul, Yogyakarta, Kulonprogo and Gunung Kidul) which shows a discrepancy between the National Medical Service Guidelines (PNPK).

In terms of sales volume between generic drugs and patented drugs or branded generics, there is a very strong dominance of generic drugs with a total sales of 408 boxes compared to 25 boxes of sales for patented drugs or branded generics. This dominance shows that consumers in the Tokopedia e-commerce in Yogyakarta tend to choose drugs with more affordable prices, which is consistent with the characteristics of generic drugs. This preference can also reflect the high public awareness of the effectiveness and safety of generic drugs that have been guaranteed by the Food and Drug Regulator, as well as reflecting the economic conditions of consumers who prefer more economical and affordable treatment options. However, it can be seen in the ACE Inhibitor group, where the number of branded drugs that did not sell or were not sold and generic drugs (11 boxes), indicating that for this group there is a market tendency towards certain brands that may be associated with quality or consumer trust in the brand. This phenomenon shows that although generic drugs dominate overall, there are certain market segments in the antihypertensive category that maintain high demand for branded drugs, which may be influenced by perceptions of quality, recommendations from health workers, or marketing strategies of drug manufacturers (Lombardo et al., 2019). Based on the research data, an overview of the distribution and preferences of types of antihypertensive drugs sold online in this region was obtained. This study examined five districts/cities in the Yogyakarta province (Sleman, Bantul, Kulon Progo, Gunungkidul, and Yogyakarta City). The types of antihypertensive drugs analyzed included five main groups, ARB (Angiotensin Receptor Blockers), Diuretics, CCB (Calcium Channel Blockers), Beta Blockers, and ACE Inhibitors, and in this case the data also differentiates between generic and patented products.

Yogyakarta City dominates sales for almost all types of drugs, especially generic CCB (Calcium Channel Blockers) namely (142 boxes) and Sleman City for CCB (Calcium Channel

Blockers) with the number (50 boxes) and generic Beta Blockers (35 boxes), then Kulonprogo is one of the areas with unsold hypertension drugs from the 5 groups, indicating a lack of purchases in the online process. Then for the Gunung Kidul area, the best-selling items are in the ARB (Angiotensin Receptor Blockers) group with a quantity of (2 boxes) only and only in that group in this area and in other groups it does not sell well and in the Bantul area the best-selling items are in ARB (Angiotensin Receptor Blockers) with a quantity of (13 boxes).

Overall, total sales of all categories of antihypertensive drugs on Tokopedia for the Yogyakarta province, especially in the areas of Sleman, Bantul, Yogyakarta, Kulon Progo and Gunung Kidul, amounted to 433 boxes. This data reflects that the use of e-commerce platforms for purchasing hypertension drugs is quite significant and makes it easier for people in the purchasing process because they only order via e-commerce, especially in densely populated areas such as Sleman and Yogyakarta Regencies (Asna et al., 2024). This study emphasizes the importance of expanding digital access and health education to all regions so that the use of online pharmacy services can be evenly distributed and support chronic treatment such as hypertension more effectively and efficiently. This study provides important insights into the dynamics of online consumption of antihypertensive drugs in the Special Region of Yogyakarta, and can be the basis for formulating policies for drug distribution and digital health promotion in the future (Hussain et al., 2016).

CONCLUSION

Based on the results of the study on the sales pattern of antihypertensive drugs in the Special Region of Yogyakarta through the Tokopedia platform, it can be concluded that the distribution and sales volume are still concentrated in areas with high populations such as Sleman Regency with a sales figure of 140 and Yogyakarta City 262 while other areas such as Kulon Progo and Gunungkidul recorded very low sales of 29 and 0, and in Bantul with a sales figure of 29 boxes. The type of drug most often chosen is generic, especially from the CCB and ARB groups, indicating a tendency for people to choose more affordable drugs. However, there is a tendency to choose drugs in the ACE Inhibitor group where this group is the smallest or has the least sales. This study highlights the need for a strategy for equalizing access and education related to the use of e-commerce in the pharmaceutical sector, in order to support the management of chronic diseases more evenly and efficiently throughout the Yogyakarta region.

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