

## Antihypertensive Drug Prescribing Pattern at Pharmacy X Yogyakarta

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### ABSTRACT

Hypertensive patients who have seen a doctor at primary or advanced health facilities generally get a doctor's prescription. On the antihypertensive drug prescription sheet, information can be obtained about the pattern of prescribing antihypertensive drugs such as the classification of antihypertensive drugs used for patient treatment and gender characteristics of hypertensive patients. This study aims to describe the characteristics of hypertensive patients and the types of antihypertensive drugs prescribed by doctors and purchased at Pharmacy X Yogyakarta. The research method used was a retrospective quantitative descriptive study using a sample of the entire population of prescriptions containing antihypertensive drugs during January to June 2023. The results of the study found that the number of prescriptions containing antihypertensive drugs at Pharmacy X Yogyakarta fluctuated between 3 to 10, with the gender characteristics of patients balanced between men and women. The types of antihypertensive drugs that patients buy every month with a doctor's prescription are the most cardioselective beta blockers, ARBs, and CCBs of dihydropyridine.

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## 1. INTRODUCTION

Hypertension is the most common risk factor that can trigger cardiovascular disease (CVD), stroke, and kidney failure [1]. Hypertension is the second leading cause in the diagnosis of chronic kidney disease (CKD). It is estimated that more than one billion adults worldwide suffer from hypertension and this figure is projected to increase to 1.56 billion by 2025, which is an increase of 60% from 2000. The increasing prevalence of hypertension has been linked to population growth, aging and risk behavioral factors, such as unhealthy diet, excessive alcohol use, sedentary lifestyle, obesity, and exposure to stress [2]. As many as 9.4 million deaths occur worldwide each year due to hypertension, and are responsible for about 50% of deaths from heart disease and stroke. Epidemiological studies show that

The prevalence of hypertension is increasing rapidly in India, varying from 4 to 15% in urban areas and 2-8% in rural populations [3]. Cardiovascular disease and hypertension cost 4% of gross domestic product for low- and middle-income countries annually, amounting to \$500 billion. Managing blood pressure in hypertensive patients is important for CVD prevention and reduced mortality.<sup>2,3</sup> Clinical evidence suggests that lowering blood pressure (BP) with antihypertensive drugs reduces the risk of myocardial infarction, stroke, heart failure, revascularization procedures, and end-stage renal disease in hypertensive patients.

Antihypertensive drugs are prescribed primarily to reduce morbidity and mortality caused by hypertension and its complications, often patients need more than one medication to effectively control hypertension [4]. Various classes of hypertension drugs such as diuretics, renin-angiotensin system inhibitors, calcium channel blockers (CCBs) and beta blockers (BB) have been shown to reduce hypertension complications and can be used as initial drug therapy. Since the need to improve hypertension control is well known, several guidelines regarding classification and management have been developed [5]. Some bodies that have developed guidelines are the American Society of Hypertension/International Society of Hypertension (ASH/ISH), the Joint National Committee (JNC) on Detection, Evaluation, and Treatment of High Blood Pressure, the European Society of Hypertension (ESH)/European Society of Cardiology (ESC), the National Institute for Health and

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Care Excellence (NICE), and the Japanese Society of Hypertension. JNC Guideline 8 published in 2014 is the latest guideline for the management of hypertension in a variety of clinical settings. These guidelines were developed based on a systematic literature review to assist physicians, especially physicians in primary care.

**Table 1.** List of pharmacotherapies class of antihypertensive drugs

<b>Class</b>	<b>Drug Name</b>
Tiazid or thiazide-type diuretics	Hydrochlorothiazide Indapamide
ACE inhibitors	Captopril Enalapril Lisinopril Perindopril Ramipril Candesartan
ARB (Angiotensin II Receptor Blocker)	Eprosartan Irbesartan Losartan Olmesartan Telmisartan Valsartan
CCB (Calcium Channel Blocker) dihydropyridine	Amlodipin Felodipine Nifedipine Lercanidipin
CCB (Calcium Channel Blocker) non-dihydropyridin	Diltiazem Verapamil
Diuretic loop	Furosemid Torsemid
Potassium-sparing diuretics	Amyloride Triamting
Aldosterone antagonist diuretics	Eplerenon Spironolactone
Beta blocker-cardioselective	Atenolol Bisoprolol Propranolol Metoprolol tartrate
Beta blocker-cardioselective + vasodilator	Nebivolol

The definition of medication adherence is that the patient takes the medication as prescribed, and continues to take the prescribed medication based on a treatment agreement made between the patient and the doctor [6]. Adherence to treatment of patients with chronic diseases is less than optimal, decreases dramatically during the first year after the start of therapy. For example, half of patients prescribed antihypertensive drugs will discontinue treatment within 1 year after the start of therapy. Patients with chronic diseases need good cooperation with their doctors to achieve long-term goals.

Patients who adhere to antihypertensive medications are more likely to achieve good blood pressure control [7]. A meta-analysis reported that patients who adhered to antihypertensive drugs showed better blood pressure control, compared to those who did not adherent. Research evidence increasingly suggests that patients who show poor adherence to antihypertensive drugs have a higher risk of experiencing adverse outcomes, including hospitalization for all comorbidities and hospitalization for cardiovascular disease, and higher health care costs compared to patients who are adherent to antihypertensive drugs. A recent cohort study reported that the group with good adherence had a significantly lower incidence of acute cardiovascular events, compared to the group with poor

adherence to antihypertensive medication [8]. Patients with medication adherence  $\geq 80\%$  had a 33% reduced risk of CVD-related hospitalization and 45% emergency department visits.

The urgency of research on prescribing antihypertensive drugs in pharmacies is to assess how much support pharmacies have for primary-level health facilities in serving people with hypertension [9]. The problem studied is the pattern of prescribing antihypertensive drugs in pharmacies based on patient characteristics and pharmacotherapy. The purpose of the study was to provide an overview of the characteristics of patients who buy antihypertensive drug prescriptions at pharmacies and the characteristics of the types of antihypertensive drugs served by pharmacies through prescriptions [10]. The benefits of this research are for pharmaceutical personnel to be able to provide better services to patients suffering from hypertension so that they can control their blood pressure optimally in the long term, as well as for pharmacy management to be able to better manage the supply and service of antihypertensive drugs in pharmacies.

## 2. METHOD

The research method used is quantitative descriptive research with retrospective data collection. Descriptive research is a study with the main purpose of describing or describing the situation objectively [11]. Descriptive research methods are carried out to determine the existence of independent variables, either only on one or more variables without making comparisons of the variables themselves and looking for relationships with other variables. Research with a descriptive type is a research method that seeks to describe objects according to what they are [12]. The reported data is the data obtained as is in accordance with the events that are taking place at that time. Quantitative methods are data in the form of numbers, thus quantitative methods can be interpreted as research methods based on the philosophy of positivism, used to examine certain populations or samples, data collection using research instruments, quantitative data analysis. Retrospective data collection is research conducted by taking data based on what has happened in the past.

The population and samples that are the primary data sources in this study are doctor's prescriptions containing antihypertensive drugs during the period January to June 2023 [12]. The variables in this study were doctor's prescriptions containing antihypertensive drugs, pharmacotherapy classes of antihypertensive drugs, and the characteristics of patients taking antihypertensive drugs [13]. A doctor's prescription containing antihypertensive drugs is a doctor's prescription, both a physical prescription and an online prescription, which contains at least one type of antihypertensive drug, where the prescription can still be served (not a prescription that has run out or returned) and purchased at Apotek X Yogyakarta during January to June 2023. The pharmacotherapy class of antihypertensive drugs is the pharmacotherapy class of antihypertensive drugs as shown in table 1. The characteristics of patients taking antihypertensive drugs are the gender of patients who take antihypertensive drugs as written in a doctor's prescription. Data collection is carried out by recording pharmacy records for doctor's prescriptions containing antihypertensive drugs during January to June 2023 by recording prescription numbers, antihypertensive drug names, rules of use, and patient gender.

## 3. RESULTS AND DISCUSSION

The study conducted from January to June 2023 recorded 44 prescription sheets containing antihypertensive drugs with the distribution of the number of prescriptions as in table 2.

**Table 2.** The amount of prescriptions containing antihypertensive drugs

<u>Time</u>	<u>Amount of Prescriptions</u>
January 2023	10 sheets
February 2023	3 sheets
March 2023	7 sheets
April 2023	10 sheets
May 2023	9 sheets
June 2023	5 sheets

The varying number of prescriptions indicates that purchasing antihypertensive drugs with a prescription at pharmacies is not a top priority for patients [14]. It is very possible for patients to

choose primary level health facilities as the main place to buy prescriptions, while pharmacies as an alternative place. Gender characteristics of patients who purchased antihypertensive drugs in pharmacies are presented in table 3.

**Table 3.** Patient characteristic by gender

Time	Amount of Prescriptions	Gender
January 2023	10 sheets	Male 4 persons and female 6 persons
February 2023	3 sheets	Male 1 person and female 2 persons
March 2023	7 sheets	Male 3 persons and female 4 persons
April 2023	10 sheets	Male 4 persons and female 6 persons
May 2023	9 sheets	Male 6 persons and female 3 persons
June 2023	5 sheets	Male 3 persons and female 2 persons
Total		Males 21 persons and females 23 persons

The differences in male and female patients gender are not significantly different, so it can be stated that gender characteristics in patients who buy antihypertensive drugs with a doctor's prescription cannot be determined preferences. Prescribing patterns classified by pharmacotherapy class of antihypertensive drugs are illustrated from table 4.

**Table 4.** Pharmacotherapy classes of prescribed antihypertensive drugs

Pharmacotherapy Class	Time (2023)					
	January	February	March	April	May	June
Tiazid or thiazide-type diuretics						
ACE inhibitors			1		2	
ARB's	5	2	3	5	2	2
CCB's dihydropyridine	3	1	1	4	4	1
CCB's nondihydropyridin	1					
Diuretic loop			1		2	2
Potassium-sparing diuretics						
Aldosterone antagonist diuretics	1	1	1	1	1	2
Beta blocker-cardioselective	4	2	6	4	3	2
Beta blocker-cardioselective + vasodilator						

Based on the pattern of prescribing antihypertensive drugs at Apotek X Yogyakarta, the most drug prescriptions were obtained are cardioselective beta blockers (bisoprolol and propranolol) followed by angiotensin II receptor blockers or ARBs (candesartan, valsartan, and irbesartan), then calcium channel blockers or CCB dihydropyridine (amlodipine), and the least although prescribed monthly is the antagonist diuretic aldosterone (spironolactone). While the prescription of antihypertensive drugs that are not routine every month and the amount is small are loop diuretics (furosemide), ACE-inhibitors (ramipril), and CCB non-dihydropyridine (verapamil). In addition, there are no more antihypertensive drugs prescribed at Pharmacy X Yogyakarta.

Based on the evaluation results of all patients for 6 months at Pharmacy X Yogyakarta, there were 2 patients who routinely bought antihypertensive drug prescriptions while the other patients could not trace their prescription purchase history. These data support previous research that fewer patients recognize the importance of continuity of hypertension treatment in order to maintain their long-term quality of life and avoid the risk of emergencies due to stroke or other diseases [15].

#### 4. CONCLUSION

Hypertension is a chronic disease that requires long-term treatment, but many patients do not heed hypertension treatment, increasing the risk of mortality and the onset of other diseases. Based on research on the pattern of prescribing antihypertensive drugs at Pharmacy X Yogyakarta, it was obtained that prescription data containing antihypertensive drugs every month fluctuated greatly from 3 to 10 pieces per month. The gender characteristics of patients prescribed antihypertensive drugs can be stated as balanced between men and women. Routine antihypertensive drug prescribing every month is ranked from the most are cardioselective beta blockers, angiotensin II receptor blockers (ARBs), and CCB-dihydropyridine.

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