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The level of compliance in the use of drugs based on the antihypertensive and the patient's classification of hypertension: A cross-sectional study

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Abstract

Background: The target of antihypertensive therapy is to regulate blood pressure according to the patient's condition. Patient adherence to treatment is an important factor affecting the success of hypertension treatment. The degree of hypertension of the patient and the type of antihypertensive used can be related to the level of compliance.
Objective: This study seeks to assess the correlation between adherence to antihypertensive medication and patient characteristics, antihypertensive kinds, and hypertension categorization.
Methods: This study uses descriptive-analytical methodology with a cross-sectional design that aims to describe and analyze the relationship between variables at a certain point in time. The sampling method used was purposive sampling. Seventy-eight respondents participated in interviews utilizing a compliance questionnaire. Statistical analysis of the data was conducted utilizing the chi-square test method.
Results: The study showed that most respondents had a high level of compliance (46.15%). Most respondents had blood pressure in the stage 2 hypertension category (46.15%). Based on the results of the correlation test between the level of compliance with the classification of hypertension obtained (p = 0.000).
Conclusion: The level of adherence to therapy was related to the patient's hypertension classification, but was not statistically associated with the type of antihypertensive used.

Keywords: Hypertension, Antihypertensive, Compliance Level, Blood Pressure.

INTRODUCTION

Hypertension is characterized by a systolic blood pressure over 140 mmHg and a diastolic blood pressure beyond 90 mmHg in adults, confirmed through multiple assessments (1). Approximately 1.4 billion individuals globally suffer from hypertension, although hardly 14% are able to manage it well. The prevalence of hypertension is projected to escalate, as the majority of patients remain oblivious to their condition and consequently untreated, with an anticipated increase to 1.5 billion cases annually by 2025 (2). Extensive cohort studies indicate that, with coronary heart disease and stroke, hypertension is a substantial risk factor for heart failure, atrial fibrillation, chronic renal disease, heart valve abnormalities, aortic syndromes, and dementia (3).

According to the 2018 Basic Health Research study in Indonesia, the prevalence of hypertension in Indonesia among those aged over 18 years is 34.11%. South Kalimantan Province ranks best at 44.13%, Bengkulu Province is 24th at 28.14%, and Papua Province ranks lowest at 22.22% (4). The prevalence of hypertension in Bengkulu Province reached a percentage of 28.14%, while in the city of Bengkulu the number of people with hypertension reached 82,320 cases aged ≥15 years (5).

One of the factors for the failure of hypertension therapy is the level of patient compliance in taking drugs that have been prescribed. Keeping blood pressure controlled is not enough to take antihypertensive drugs alone but is also related to patient compliance in undergoing treatment. Adherence to treatment is a crucial aspect in managing the blood

pressure of hypertensive individuals. Conversely, non-adherence is a primary factor contributing to therapeutic failure (6). If the patient does not comply with taking the drug, it can harm the development of the disease. In addition, it also increases morbidity, mortality, and treatment costs (7). This study aims to analyze the effect of the level of patient compliance in taking drugs on their blood pressure conditions.

METHOD

This investigation was carried out using a descriptive-analytical approach with a cross-sectional framework. This method is an approach in quantitative research that aims to describe and analyze the relationship between variables at a certain point in time. The data for this study was gathered in the Singaran Pati sub-district of Bengkulu City between May and July 2022. The Health Research Ethics Commission of the Poltekkes Kemenkes Bengkulu has granted approval for this study, as indicated by certificate number KEPK/129/04/2022. The sampling was conducted using purposive techniques, resulting in a total of 78 respondents being obtained. This study included respondents who were patients diagnosed with hypertension. The exclusion criterion includes pregnant patients who are hypertensive and diabetic.

This study employed interview techniques to assess the compliance levels of respondents in drug usage. This study employed a drug use compliance questionnaire as the instrument. The questionnaire comprised 12 questions and underwent validity testing. The validity test of the questionnaire yielded a correlation coefficient (r) value exceeding 0.354. Reliability tests assess the trustworthiness of indicators employed as instruments for measuring variables. An indicator is deemed reliable when the value of Cronbach's alpha (α) exceeds 0.6. (8). Based on the results of the statistical analysis of the questionnaire reliability test*, a Cronbach Alpha* value of 0.803 was obtained, and it was concluded that the instrument was reliable or consistent for use in research.

The level of compliance is seen from the scores entered into the categories "High" 9-12, "Moderately Medium" 5-8, and "Low" 1-4. Researchers measured the patient's blood pressure using a digital sphygmomanometer (Omron® Hem-8712) when respondents finished filling out the questionnaire. Data on the level of adherence of respondents using drugs associated with the results of blood pressure checks were analyzed using IBM® SPSS Statistical 25 software with the *Chi-Square statistical test method*.

RESULTS

The level of compliance

Research data indicates that the compliance level of responders utilizing antihypertensive treatment, as determined by interview results, is notably high at 46.15%. The mean score of responders for adherence to antihypertensive therapy was 7.80 points. The average degree of patient adherence to antihypertensive medication is moderate. (See Table 1).

Table 1. The level of compliance of respondents in using antihypertensive drugs (n=78)

Compliance Level	n (%)	Mean
High (1-4 points)	36 (46.15%)	7.80 ± 3.04 points
Medium (5-9 points)	29 (37.18%)	
Less (10-12 points)	13 (16.67%)	

The relationship of respondent characteristics to the level of compliance to antihypertensive use.

The research data obtained showed a variety of respondent characteristics that were quite diverse. The diversity of respondents shows that hypertension can be suffered by anyone. This study showed that 58.8% of hypertensive respondents were mostly impurated 46-65 years. From the results of data analysis showed a significant

relationship between age and the level of adherence in using antihypertensive drugs (p = 0.014) (See Table 2). This study also shows that women suffer more from hypertension (66.7%) and in terms of occupation, the most people suffering from hypertension are housewives (46.2%). Based on the level of education, most respondents in this study were Primary school (66.7%) and the duration of suffering was generally 1-5 Years (66.7%).

The relationship of the type of antihypertensive to the degree of compliance to antihypertensive use

The majority of therapies obtained by respondents were monotherapy with the most types of drugs prescribed were amlodipine 5 mg as much as 61.54% (See Table 3). The predominant form of therapy reported by respondents was monotherapy, with amlodipine 5 mg being the most frequently prescribed medication, accounting for 61.54%. All patients undergoing hypertension therapy with a combination of drugs were prescribed Candesartan. The statistical analysis of the relationship between antihypertensive therapy type and patient compliance revealed no significant association (p=0.518).

The relationship of the level of compliance to the use of antihypertensives to a patient's classification of hypertension

From this data, it can be seen that the higher the level of hypertension, the more patients have low adherence to the recommended treatment or lifestyle. Especially in Stage 2 Hypertension, where most patients (26 out of 36 people) have a low level of adherence. The statistical analysis examining the correlation between patient compliance in medication usage and blood pressure during the interview, utilizing the Chi-Square test, yielded a p-value of <0.000 (See Table 4). The data indicate a correlation between patient compliance in antihypertensive usage and blood pressure levels.

In this study, it was found that the highest number of patients with grade 2 hypertension (46.15%), followed by patients with grade 1 hypertension (41.02%). Patients with mostly grade 2 hypertension have a low level of compliance. While patients with grade 1 hypertension have a high level of compliance in carrying out therapy. The more severe the hypertension condition, the lower the level of patient adherence. This could be a concern for health workers to increase education and interventions to improve patient adherence to medication and lifestyle changes.

DISCUSSION

The incidence of hypertension escalates with advancing age. This results from natural alterations in the heart, blood vessels, and hormone levels that can elevate blood pressure as one ages (3). About 55% of adult patients aged 45 to 75 years in China and 63% in the United States have hypertension (9). The incidence of hypertension escalates as one advances in age. This phenomenon arises from the inherent transformations occurring within the heart, blood vessels, and hormonal balances, which can contribute to an elevation in blood pressure as one ages. It is evident that as the age of the respondent increases, so does the corresponding percentage.

Table 2. The relationship of respondent characteristics to the level of compliance antihypertensive use (n = 78)

Patient Characteristics		n (%)	Compliance Level			P Value
			High (n=36)	Medium (n=29)	Less (n= 13)	
Age	26-35 Years	3 (3.8%)	1	1	1	0.014*
	36-45 Years	10 (12.8%)	0	7	3	
	46-55 Years	23 (29.4%)	9	9	5	
	56-65 Years	23 (29.4%)	12	10	1	
	>65 Years	19 (24.4%)	14	2	3	
Gender	Woman	52 (66.7%)	25	18	9	0.803
	Man	26 (33.3%)	11	11	4	
Employment Status	Self employed	5 (6.41)	0	5	0	0.097
	Housewives	36 (46.2%)	15	14	7	
	Farmer/Laborer	3 (3.8%)	1	1	1	
	Civil Servants	4 (5.15)	2	2	0	
	Pensioner	7 (8.97%)	6	1	0	
	Miscellaneous	23 (29.5%)	12	6	5	
Education	Primary school	29 (37.2%)	14	8	7	0.113
	Junior High School	16 (20.5%)	7	6	3	
	High school	24 (30.8%)	8	14	2	
	College	9 (11.5%)	7	1	1	
Long Suffering	1-5 Years	52 (66.7%)	20	21	11	0.297
	6-10 Years	17 (11.5%)	6	3	0	
	>10 Years	17 (21.8%)	10	5	2	

Table 3. The relationship of the type of antihypertensive to the degree of compliance of patients using the drug (n=78)

Types of Antihypertensives	n (%)	Compliance Level			P Value
		High (n=36)	Medium (n=29)	Less (n= 13)	
Single therapy					0.518
Amlodipine 5 mg	48 (61.54%)	18	20	10	
Amlodipine 10 mg	21 (26.92%)	13	5	3	
Candesartan 8 mg	3 (3.85%)	2	1	0	
Candesartan 16 mg	1 (1.28 %)	1	0	0	
Captopril 12,5 mg	1 (1.28 %)	0	1	0	
Combination					
Amlodipine 5 mg + Candesartan 8 mg	2 (2.56%)	0	2	0	
Amlodipine 5 mg + Candesartan 16 mg	1 (1.28 %)	1	0	0	
Nifedipine 30 mg + Candesartan 16 mg	1 (1.28 %)	1	0	0	

Table 4. Relationship between hypertension classification and the level of patient compliance in using drugs (n=78)

Hypertension Classification*	n (%)	Compliance Level			P Value
		High (n=36)	Medium (n=29)	Less (n= 13)	
Normal	1 (0.013%)	1	0	0	0.000
PreHipertension	9 (11.53%)	9	0	0	
Stage 1 hypertension	32 (41.02%)	15	10	7	
Stage 2 hypertension	36 (46.15%)	6	4	26	

Sex hormones exert an influence on blood pressure through their interactions with essential organs, notably within the cardiovascular, renal, and neurological

systems (10). In this study, women constituted the majority of hypertension patients, accounting for 66.7% of the total. Prior research about hypertension indicated a similar finding, specifically that the prevalence of hypertension in women

In this poll, 46.2% of respondents identified their occupation as housewives. This condition is believed to correlate with reduced physical activity, leading to a decline in nitric oxide (NO) production alongside a corresponding reduction in endothelium-derived relaxing factor (EDRF) production, which results in elevated blood pressure (13). The more body activities the patient does, it will affect the level of health.

Respondents revealed a notable prevalence of primary school education, comprising 37.2%. The patient's limited comprehension of health leads to an ineffective strategy in addressing and managing his health concerns. The level of education significantly impacts an individual's ability to assimilate knowledge, convert it into actionable behavior, and modify their health status. Research has established a considerable correlation between health status and educational attainment (14). The personal knowledge of patients can affect their understanding of behaviors related to hypertension treatment.

The results of this study also showed that respondents with long-suffering from hypertension mostly in the range of 1-5 years (64.1%). Several related studies also show almost the same thing, namely most respondents who seek treatment at the Puskesmas are patients who have long suffered from hypertension $\leq$ 5 years (60.5%) (15,16). Patients who have had hypertension for one to five years tend to be more compliant with the process of taking medication due to great curiosity and a desire for recovery, while patients who have had hypertension for more than five years have a tendency to have worse compliance with taking medication. This is due to more patient experience, where patients who have surpasses that in men (11). The relationship between gender and the prevalence of hypertension is noteworthy, particularly as midlife hypertension tends to be more pronounced in women experiencing menopause. (12). complied with the treatment process but the results obtained are not satisfactory, so patients tend to surrender and do not comply with the treatment process undertaken (17).

This study also found data that the most commonly reported therapy by respondents was monotherapy, with amlodipine 5 mg being given most frequently, at 61.54% (See Table 3). Several studies in various locations of community health centers in Indonesia also showed a similar thing, the choice of antihypertensive monotherapy that was widely used was amlodipine (18–20).

Amlodipine is included in the Calcium Chanel Blocker (CCB) group recommended in early therapy of hypertension (2). Amlodipine has a mechanism of action by relaxing the arterioles of blood vessels. Amlodipine is vasculosillolective, has a long half-life, and slow absorption that prevents blood pressure from dropping suddenly (21) Amlodipine is also recommended by JNC 8 as first-line therapy in hypertensive patients in addition to diuretic administration (22).

The predominant antihypertensive combo therapy is amlodipine and candesartan. The administration of a combination of calcium channel blockers (CCB) and angiotensin receptor blockers (ARB) can expedite blood pressure reduction in elderly patients with hypertension, diminish morbidity and mortality associated with moderate complications, and provide cardioprotection during blood pressure management with minimum adverse effects (23). The correlation between the categories of antihypertensives administered and patient compliance in medication usage is not significant; nonetheless, evidence indicates that

responders utilizing antihypertensive monotherapy exhibit a high level of adherence. An increase in the variety of medications utilized correlates with a decrease in adherence to drug usage.

If the patient is not compliant with taking medication, it can have a negative effect on disease progression. It also increases morbidity, mortality, and treatment costs. Patient compliance in terms of taking drugs regularly is very important for hypertensive patients in order to control blood pressure. In addition, compliance is also something that greatly supports the success of therapy.

Patients exhibiting low adherence rates demonstrate suboptimal therapy outcomes, resulting in many failing to achieve the anticipated targets (24). Various factors contribute to inadequate adherence, including socioeconomic position, demography, and environmental influences. Notably, age, income, race, ethnicity, and health literacy—encompassing digital literacy—are frequently linked to therapeutic adherence (25–28).

Table 4 shows a significant relationship between the level of patient compliance in using antihypertensive drugs and the classification of blood pressure experienced (p = 0.000). This data shows that the higher the level of patient compliance in using drugs, the better the blood pressure control. Classification of hypertension based on Joint National Committee VII (29).

CONCLUSIONS

The level of compliance in undergoing therapy is related to the patient's gender and hypertension classification but is not statistically related to the type of antihypertensive used.

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