Jurnal Kesehatan
Vol. 15, No. 2, August 2024
ISSN 2086-7751 (*Print*), ISSN 2548-5695 (*Online*)
http://ejurnal.poltekkes-tjk.ac.id/index.php/JK

Correlation of Clinical Factors with Hypertensive Patient Medication Adherence

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ARTICLE INFO

Article history

Received date
17 Dec 2023

Revised date
28 Aug 2024

Accepted date
30 Aug 2024

Keywords:

Bandar Lampung;
Hypertension;
Patient adherence.

ABSTRACT

Hypertension is the primary risk factor for both disability and death worldwide, mainly due to two significant complications: strokes (cerebrovascular accidents) and ischemic heart disease. Hypertension is a condition when systolic blood pressure ≥140mmHg and or diastolic blood pressure ≥90mmHg. Patient adherence is an indicator of the efficacy of therapy. Patient adherence measurement could be done by indirect methods such as self-report and pill count methods. The study aims to determine the correlation between clinical factors and medication adherence in hypertensive patients at Rajabasa Indah Community Health Center. This is a descriptive-analytic study with a cross-sectional approach. Purposive sampling was used in the sampling technique. There are 100 respondents in this study, patients diagnosed with hypertension at Rajabasa Indah Community Health Center who met the inclusion and exclusion criteria. A total of 45 patients were included in the category of non-adherent patients taking medication, and 55 patients were included in the category of patients who adhered to taking medication. This study showed that factors that influenced drug adherence in hypertensive patients were comorbidities (p=0.004), duration of treatment (p=0.007), the number of medications (p=0.002), and history of side effects (p=0.002). Medication adherence has been linked with some clinical factors such as comorbidities, duration of treatment, number of medications, and history of side effects. Incorporating adherence evaluation into the overall assessment of patients undergoing hypertension treatment should be essential.

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INTRODUCTION

The increase in life expectancy of people in Indonesia continues from year to year. The Central Statistics Agency reported that the life expectancy of Indonesia's male population in 2021 reached 69.69 years, and for women, it was 73.55 years. This figure has continued to increase for both men and women over the past 3 years. The life expectancy of people in Lampung province in 2021 reached 68.86 for men and 72.69 for women (Badan Pusat Statistik, 2022). Higher life expectancy refers to the increase in physical and financial well-being. However, what happens today is that as financial well-being increases, it can lead to a rise in the incidence of degenerative diseases, one of which is hypertension.

Hypertension is a condition when systolic blood pressure ≥140mmHg and or diastolic blood pressure ≥90mmHg (Eighth Joint National Committee 8, 2014). Hypertension can result in complications such as heart failure, kidney disease, and cerebrovascular disease. Deaths due to Non-Communicable Diseases (NCDs) in Indonesia tend to increase. According to the 2023 Indonesian Health Survey, the prevalence of hypertension in Indonesia based on a doctor's diagnosis is 8.6%. The prevalence of hypertension in Lampung Province, based on a doctor's diagnosis, increased from 7.3% in 2013 to 7.9% in 2023 and, based on measurements, increased from 24.7% to 30.8% in 2023. The prevalence of hypertensive patients based on measurements in Bandar Lampung in 2023 reached 29.7% (The Health Development Policy Agency, 2024). This figure places Bandar Lampung city in 5th place out of 15 towns/regencies in Lampung Province.

Medication adherence is a complex behavior influenced by patient-related factors, the healthcare team/system, and demographic, clinical, social, and economic factors (Kai et al., 2021). The factors positively associated with adherence were healthcare system-related factors: good patient-health provider relationship,

accessibility of health services, use of specialty clinics and programs for hypertension, and health insurance. The factors found to be negatively associated with adherence are social, economic, patient-related, therapy-related, and condition-related factors. Therapy-related factors can be called clinical factors, including comorbidity, number of medications, duration of treatment, and history of side effects (Gutierrez & Sakulbumrungsil, 2021).

In most cases, hypertension is detected during the physical examination for specific disease reasons, so it is often referred to as a "silent killer." Without realizing it, patients experience complications in vital organs such as the heart, brain, or kidneys (Ministry of Health RI, 2019). The prevalence of hypertension in Indonesia, according to Basic Health Research in 2013, increased from 7.6% in 2007 to 9.5% in 2013 and, based on the results of measurements at the age of ≥18 years, amounted to 25.8%. The results from Basic Health Research in 2018 show the prevalence of hypertension in the population of ≥18 years based on national measurements of 34.11% (Ministry of Health RI, 2021).

The adherence rate of hypertensive patients in Indonesia is only 54.4% (Ministry of Health RI, 2019). Several factors can affect patient compliance in undergoing treatment. Based on a Sinuraya et al. (2017) study, knowledge about hypertension influences medication adherence. Other factors contributing to patient adherence are the education level and the disease duration. Pratiwi et al. (2020) concluded that factors such as education level, disease duration, family support, support from health workers, and motivation for treatment have a relationship with hypertensive patient adherence to medication.

Data obtained from Rajabasa Indah Community Health Center show hypertension is one of the most common types of diseases suffered by patients. Of the 10 most common diseases in Rajabasa Indah Community Health Center, hypertension cases are in 2nd place, with a total of 993 patients in 2014 (Bertalina, 2016). There has been no related study about hypertensive patient adherence in Rajabasa Indah Community Health Center. Based on what has been described, we are interested in conducting a study, "Correlation Clinical Factors with Hypertensive Patient Medication Adherence at Rajabasa Indah Community Health Center." This study aims to know the correlation of clinical factors that affect hypertensive patient adherence at Rajabasa Indah Community Health Center. We hypothesize there is a correlation between clinical factors and hypertensive patient adherence to taking medication.

METHOD

This study is analytical descriptive research with a cross-sectional approach. This study aims to determine the correlation between clinical factors affecting hypertensive patient adherence in Rajabasa Indah Community Health Center. This study used a cross-sectional approach with simultaneous measurements of dependent and independent variables. The dependent variable in the study was medication adherence, as measured by scores obtained from the MMAS-8 questionnaire. The independent variables in the study consisted of clinical characteristics: comorbidity, duration of therapy, number of tablets, and history of side effects. The study was conducted from April to July 2023 at Rajabasa Indah Community Health Center, Bandar Lampung. The population in this study are all hypertensive patients at Rajabasa Indah Community Health Center. The sample of this study are patients diagnosed with hypertension at Rajabasa Indah Community Health Center from April to July 2023 who met the inclusion and exclusion criteria. This study was conducted on 100 hypertensive patients who received routine hypertension therapy at Rajabasa Indah Community Health Center. The sampling technique in this study is purposive sampling. The inclusion criteria of this study are:

1. An adult patient who was diagnosed with hypertension at Rajabasa Indah Community Health Center, Bandar Lampung, from April to July 2023
2. Able to hear and communicate with Bahasa
3. Willing to become respondents in this study

The exclusion criteria in this study are that respondents still need to complete the study.

Direct and indirect methods can be used to measure patient adherence. Indirect methods include self-reporting, interviews, therapy results, calculating remaining drugs consumed, and computer compliance monitors. The indirect method has advantages over the direct method, which is cheaper, easy to manage, short, can distinguish different types of non-adherence, acceptable to the patient, can be trusted, can provide information about behavior and beliefs towards treatment, and valid (Culig & Leppée, 2012).

Examples of measurement with indirect methods are self-report and pill count methods. The self-report method has various

questionnaires, including the Medication Morisky Adherence Scale-8. This questionnaire's advantage is that it is easy and can be used for chronic disease research (Korb-Savoldelli et al., 2012). The calculation on the MMAS-8 questionnaire is as follows: patients with a score of > 2 have low adherence; If the patient's score is 1-2, the patient has moderate adherence, and if it is 0, it indicates that the patient has high medication adherence (Saadat et al., 2015).

MMAS-8 in the Bahasa version was used in this study. Data obtained by questionnaires that have been tested for validity and reliability. The results of the psychometric properties of the reliability test and validity test showed that the MMAS-8 versions of Indonesia have high reliability and validity well, with the results of internal consistency reliability assessed using Cronbach's alpha coefficient was 0.824 and the test results of test-retest reliability using Spearman's rank correlation was 0.881 (Riani et al., 2017). Data analysis in this study consisted of univariate and bivariate analyses. Univariate analysis is carried out to provide an overview of the variables studied. Bivariate analysis was performed with Chi-square to determine the correlation between independent and dependent variables. This study has been declared ethically appropriate with ethical approval number No.305/KEPK-TJK/V/2023.

RESULTS

Table 1. Demographic data

Variable	f	%
Sex		
Male	22	22
Female	78	78
Age		
≥60 years	39	39
<60 years	61	61
Education		
Primary	45	45
Above high school	55	55
Employment		
Employees	49	49
Unemployed	51	51
Income		
<Rp. 2.700.000	41	41
≥Rp. 2.700.000	59	59
Marital status		
Married	49	49
Unmarried	51	51

Based on sociodemographic data, most hypertensive patients in outpatient services at Rajabasa Indah Community Health Center were female, with 78 respondents. Most respondents are still at a productive age (61.0%). The education category is made into two categories. Primary education is respondents who complete education only at the elementary and junior high school. The category above high school is respondents who continue their education to the high school or college level. We also created categories in employment variables. Respondents to the category of retirees without other jobs were put into the unemployed category. In the marital status variable, two categories were created. Divorced, widowed, and widower respondents were included in the unmarried category.

Table 2. Clinical characteristic

Variable	f	%
Comorbidity		
Yes	40	40
No	60	60
Duration of therapy		
≥5 years	41	41
<5 years	59	59
Number of medications		
≥5	47	47
<5	53	53
History of drug side effects		
Yes	48	48
No	52	52
Adherent status		
Adherent	55	55
Non-adherent	45	45

Table 2 shows the clinical characteristics of respondents. As many as 40% of respondents with comorbidities had comorbidities, and 60% did not. There were 41 respondents with a duration of therapy ≥5 years. In the number of medication variables, 47 respondents were taking routine medication ≥5 each day. A total of 48 patients experienced a history of drug side effects during hypertension treatment.

The chi-square test was used to determine whether there was a correlation between the two variables. The results showed that 40% of respondents had comorbidities. As many as 62.5% of patients with comorbidities fall into the category of non-compliant patients. There are 59 respondents had been treated for hypertension for <5 years. As many as 66.1% of them are adherent to taking hypertension medication. At the same time, 41 (61.0%) patients who had used hypertension drugs for more than five years were non-adherent in taking medication.

Table 3. Association between clinical factors and patient adherence

Variable	Non-Adherent		Adherent		p-value	OR	95%CI
	n=45	%	n=55	%			
Comorbidity							
Yes	25	62.5	15	37.5	0.004	3.333	1.446 – 7.686
No	20	33.3	40	66.7			
Duration of therapy							
≥5 years	25	61.0	16	39.0	0.007	3.047	1.332 – 6.968
<5 years	20	33.9	39	66.1			
Number of medications							
≥5	29	61.7	18	38.3	0.002	3.726	1.624 – 8.549
<5	16	30.2	37	69.8			
History of drug side effects							
Yes	29	60.4	19	39.6	0.003	3.434	1.504 – 7.840
No	16	30.8	36	69.2			

There are two groups in the number of medications variable. As many as 61.7% of patients who took ≥5 medications were included in non-adherent patients, while as many as 38.3% fell into the adherent category. In the group with the number of medications <5 drugs, as many as 30.2% of respondents were included in the group of non-adherent patients, and 69.8% of respondents were included in the group of patients who were obedient to taking medication. As many as 48% of respondents had a history of drug side effects due to hypertension therapy, and 52% of them did not experience it. In the group of patients who experienced drug side effects, as many as 60.4% of respondents were non-compliant patients, and 39.6% were adherent in taking medication. As many as 48% of respondents had a history of drug side effects due to hypertension therapy, and 52% of them did not experience drug side effects. In the group with a history of drug side effects, as many as 60.4% of respondents were non-adherent patients, and 39.6% were adherent in taking medication.

DISCUSSION

This result is in line with a previous study in 2019. Women will experience an increased risk of hypertension after menopause, which is over the age of 45 years. Women who have gone through menopause have low estrogen levels. This estrogen increases high-density lipoprotein (HDL) levels, which play a role in maintaining blood vessel health (Falah, 2019).

Hypertension is a highly prevalent condition with numerous health risks, and the incidence of hypertension is most significant among older adults. Several fundamental mechanisms, including inflammation, oxidative stress, and endothelial dysfunction, are expected to promote biological aging and hypertension development and appear to have critical mechanistic roles in developing late-life hypertension's cardiovascular and collateral risks (Buford, 2017).

This study showed that respondents under 60 years old amounted to 61 patients. Theoretically, the older you are, the more at risk you are of suffering from hypertension (Nuraeni, 2019). However, this study showed that the older you get, the lazier you will be to seek treatment routinely. This is further reinforced by low family support, long home distances, and the absence of family members who can accompany you to healthcare facilities. Several factors play a role in the prevalence of hypertension in adults. Some of those factors are genetics, age, lifestyle factors such as lack of physical activity and salt consumption, and socioeconomic status. Socioeconomic factors often used in hypertension prevalence and control research are education, income, and marital status.

In this study, there were no significant differences in education, occupation, income, and marital status to patient adherence. These results are different from previous studies. Education is most widely used in socioeconomic measurement in epidemiological studies. Especially in correlation with the prevalence of hypertension (Kim et al., 2021). Other studies showed that patient education significantly improved adherence. Poor health literacy is linked to a range of unfavorable health outcomes, possibly due to improper self-care, incomplete health responsibility, and under-utilization of available healthcare resources. Methods to augment health literacy, rather than providing disease information, might be valuable in enhancing medication adherence (Taibanguay et al., 2019). Patients with a high level of education must have more knowledge and be more concerned for their

health. For example, patients with higher education levels will want to maintain salt intake, drink enough water, not smoke, and routinely carry out physical activity (Qin et al., 2022).

Another socioeconomic status variable is income level, which is not significantly related to the incidence of hypertension. The results of this study are not in line with previous studies that at the level of low-income groups have a higher increased risk of hypertension than those of high-income groups. Meta-analysis studies conducted by previous studies in low-income and low-income countries showed that low-income countries show significant results for hypertension (Sarki et al., 2020).

Hypertension is a significant risk factor for cardiovascular disease, which is the leading cause of mortality. Patient adherence to treatment is an essential factor in controlling hypertension and its complications. This study showed that as much as 45% of respondents are non-adherent. This is similar to the national population of hypertensive patients; it is known that only 8.8% are diagnosed with hypertension, and 13.3% of those who are diagnosed with hypertension do not take medication, while 32.3% do not take medication regularly (non-adherent) Ministry of Health RI, 2019).

This study found that patients without comorbidities were more adherent. These results are quite similar to those of the study conducted in Saudi Arabia. In that study, as many as 303 respondents participated, with a total of 42.2% of participants included in the category of adherence to hypertension treatment. Almost half of the participants (49.0%) who reported having no comorbidities were adherent to antihypertensive medications compared to participants with one or more than one comorbidity 41.39%, respectively. The presence of comorbid conditions and being on multiple medications were significantly associated with medication adherence (Algabbani & Algabbani, 2020). These findings indicate that the presence of comorbidities in hypertensive patients causes the number of drugs to be consumed by patients so that patients are confused and find it too difficult to remember all the drugs that they must consume.

Respondents with a duration of illness ≥5 years are 41 respondents. As many as 61.7% were included in the non-adherent patient group, and the rest were compliant patients. Conversely. in the group of patients with a disease duration <5 years. As many as 66.1% of respondents fell into the category of adherent patients. This research is based on previous research conducted in a rural area of Iran. The study's results suggest that the duration of illness was a factor that showed a significant positive correlation with medication adherence. Several studies confirm that a long history of hypertension is effective in medication adherence, and there is also a direct relationship between a long history of hypertension, on average ten years, and medication adherence, which may be predictive (Mamaghani et al., 2020).

In the number of drugs, respondents who were taking routine drugs ≥5 drugs are 47 respondents. As many as 61.7% of them fall into the category of non-adherent patients, and the rest of them are adherent patients. Respondents with the number of drugs <5 drugs, as many as 69.8% of them are adherent to hypertension treatment. This is similar to a previous study that showed medication adherence had a positive correlation with the duration of hypertension, while it negatively correlated with the number of medications used and concurrently with other diseases (Thirunavukkarasu et al., 2022). Complex regimens with multiple medications, especially when paired with multiple daily doses, are recognized as barriers to adherence. The more medicine consumed, the more confused the patient will be and the more likely they will forget to take it. Alternatively, fewer medications and significantly fewer pills, which can be implemented using once-daily single-pill combinations, are consistently associated with better adherence and hypertension control (Burnier & Egan, 2019).

In patients with a history of drug side effects, as many as 60.4% of respondents are non-adherent patients. In patients without a history of drug side effects, a group of as many as 69.2% of them are adherent to hypertension medication. Medication adverse effects can be severe enough to affect adherence to antihypertensive medications. Symptoms affecting the patient's quality of life and attributed by the patient to adverse effects of antihypertensive medication can change their medication intake behavior without appropriate communication with healthcare providers (Hamrahian et al., 2022). Instead, patients should be able to tell health workers about the side effects experienced, and patients should be involved in selecting the therapy they will undergo.

Of course, this study has some limitations. For example, no blood pressure measurements were taken during data collection. The researchers relied solely on the doctor's diagnosis that the patient had hypertension. We hope that in future studies, patient blood pressure can be

measured and classified according to the stage of hypertension.

CONCLUSION

Medication non-adherence is an underestimated, modifiable risk factor in the management of hypertension. Some factors significantly contribute to antihypertensive medication non-adherence in hypertensive patients. Patient-related factors include comorbidity, number of medications, duration of illness, and history of side effects. While no perfect method exists to assess medication adherence, a multi-complementary strategy can improve medication adherence by focusing on interventions to address immediate short-term barriers and maintain long-term adherence. Medication adherence is a critical preventive measure in managing chronic diseases like hypertension.

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