Relationship Between Knowledge and Adherence to Antihypertensive at Public Healthcare in Banjarmasin City, Indonesia

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Abstract

Hypertension is one of the world's most hazardous diseases since it harms the heart, brain, kidneys, and other organs. Patients' understanding of hypertension can be the key to successful treatment. Nonadherence with antihypertensive medication is a primary cause of therapeutic failure and is considered a serious issue. The purpose of this study is to examine the association between antihypertensive knowledge and adherence at public healthcare facilities. This study employed a quantitative approach using a cross-sectional design. The purposive sampling technique determined the sample, resulting in 100 hypertensive respondents from Public Healthcare. Knowledge is the independent variable in data collection; adherence to antihypertensive medications is the dependent variable; and demographic variables are the confounding variable. We employed the HFQ (Hypertension Fact Questionnaire) and MMAS-8 (Modified Morisky Adherence Scale-8) questionnaires as data-gathering instruments. We conducted univariate, bivariate, and multivariate analyses on the data using SPSS. Based on the study's findings, it is possible to conclude that there is a significant association between knowledge level and adherence with antihypertensive medicine use in public healthcare, with a p-value of 0.003. Comorbidities are a risk factor for hypertension that affects adherence, with a p-value of 0.007 and an OR of 0.801, indicating that patients are 0.801 times more likely to take their medicine.

Keywords: Hypertension, Knowledge, Adherence

Introduction

Hypertension is a medical condition that can affect anyone, regardless of age. It is one of the most severe diseases in the world, causing serious damage to the heart, brain, kidneys, and other vital organs. Hypertension affects approximately 1.28 billion people aged 30-79 worldwide, with the vast majority (almost two-thirds) residing in low- and middle-income nations. An estimated 46% are unaware of their elevated blood pressure. Only around one in five people with hypertension appropriately manages their blood pressure, while less than half, 42%, have received recognition and treatment. Hypertension is a prominent cause of premature death worldwide. One of the global goals for managing noncommunicable illnesses is to lower the prevalence of hypertension by 33% between 2010 and 2030[1].

According to the 2018 RISKESDAS data, the prevalence of hypertension in Indonesia in the population aged 18 and overreached 34.1%. South Kalimantan has the highest prevalence at 44.1%, while Papua has the lowest at 22.2%. Estimates place the total number of hypertension cases in Indonesia at 63,309,620, and the number of deaths at 427,218. Hypertension is most common in 31-44 years old (31.6%), 45-54 years old (45.3%), and 55-64 years old (55.2%). We have identified only about 8.8% of all cases as hypertensive.

In 2022, data from the Banjarmasin City Health Office showed that essential hypertension ranked first in all health centers with 56,269 cases. This confirms that hypertension is still a significant problem for public health services and programs in Banjarmasin City. The patient's understanding of hypertension is an essential component for achieving successful therapy and effectively controlling blood pressure. Enhanced understanding of the illness increases the patient's consciousness of upholding a healthful way of life and following the prescribed drug regimen, leading to higher rates of adherence. Failure to comply with medical instructions may result in severe problems and impact blood pressure management. Adherence has a crucial role in the ongoing management of hypertension patients' long-term health. Non-adherence with antihypertensive medication is a primary reason for the failure of therapy, resulting in hypertension being the primary cause of mortality in Indonesia[2,3].

Healthcare practitioners perceive patient non-adherence to be a significant issue. A person's level of knowledge influences how well they adhere to their drug regimen. Hence, a comprehensive comprehension of antihypertensive medications is vital to facilitate effective treatment. Individuals with hypertension must possess awareness regarding the significance of consistently using antihypertensive medications. Additionally, they should comprehend the potential hazards and repercussions associated with non-adherence to antihypertensive treatment regimens[4].

According to data from the Banjarmasin City Central Bureau of Statistics for 2024, South Banjarmasin District has a high population density, reaching 167,928 people in 2022. This density is often a risk factor for various health problems, including hypertension. Preliminary studies show that the Healthcare in South Banjarmasin Subdistrict has the highest number of hypertensive patients, with 1,352 patients, many of whom have low education levels. Research on the relationship between knowledge level and adherence to taking antihypertensive medication at healthcare has never been conducted, so the descroption of the relationship is unknown.

Methods

This study employed a quantitative observational approach, utilizing a cross-sectional research design. The data collected in this study includes patient knowledge as the independent variable and patient adherence to therapy as the dependent variable. In this study, knowledge is defined as all information known by hypertensive patients about hypertention in response to the questions of HFQ, meanwhile patient adherence refers to the behavior of hypertensive patients that aligns with the recommendations provided by healthcare professionals. Confounding variables were also considered in this study, such as demographic features. The Public Healthcare conducted the study from February to April 2024.

The population in this study consisted of 1352 hypertension patients who received treatment at Public Healthcare between January and March. The data gathering technique to be employed is Purposive Sampling, which involves including all subjects who match the inclusion requirements and exist during a specified time frame, in order to ensure an adequate number of respondents. The study utilized a sample size of 100 respondents. The study included patients diagnosed with hypertension and receiving treatment at Public Healthcare. They were required to complete questionnaires and be willing to undergo therapy. The study excluded patients who were illiterate, elderly, pregnant with hypertension, or had mental and cognitive abnormalities. The study employed the HFQ (Hypertension Fact Questionnaire) and MMAS-8 (Modified Morisky Adherence Scale-8) questionnaires as data collection instruments. HFQ was validated and tested for reliability by Salem (2011) in Pakistan, obtaining a Cronbach's alpha of 0.70, which was considered valid. Subsequently, the HFQ questionnaire was adapted into Indonesian and revalidated by the researcher Hardiyani (2017), yielding a Cronbach's alpha of 0.707 (considered reliable when the Cronbach's alpha value is > 0.6). The psychometric analysis of the MMAS-8 Indonesian version shows strong reliability and validity. The internal consistency, evaluated using Cronbach's alpha coefficient, was found to be 0.824, while the test-retest reliability, assessed using Spearman's rank correlation, was 0.881. The data was analyzed using univariate analysis, bivariate analysis with chi-square test, and multivariate analysis with logistic regression test using SPSS.

Results and Discussion

The Research Ethics Commission of Muhammadiyah University Banjarmasin granted the study its ethical approval under the reference number 091/UMB/KE/III/2024. Patients with hypertension who signed an informed consent form were eligible for the research samples. Table 1 displays the sociodemographic data of 100 respondents. Table 2 displays the patient's condition, including the duration of hypertension and comorbidities.

The study's results were based on the respondents' gender, as shown in Table 1. The study reveals that 78% (78 respondents) are women. This shows that women tend to have higher hypertension than men. This is in line with research (Artaviachika, 2022) 5 which shows that the prevalence of hypertension in women is greater than men, namely the number of female respondents as many as 146 (73%), and male respondents as many as 54 (27%). One factor that remains constant is gender. Women have a higher risk of hypertension than men. Generally, women who enter old age will experience menopause, which can cause a decrease in estrogen and HDL (high-density lipoprotein) secretion, thus triggering an increase in blood

pressure. In addition, obese women are more prone to hypertension. Obesity rates tend to be higher in women than in men. Therefore, the risk of hypertension in women can be related to reproductive age, fertility rate, and menopause[6].

According to Table 1, the study's results were based on the respondents' ages. The study reveals that 62 respondents, or 62%, are aged 51–60, while 2 respondents, or 2%, are the youngest, aged 20–30. This is in line with research Yunus, M et al (2021)[7], which shows that most respondents aged 51–60 were 135 patients (50.4%). According to the study's findings, aging can lead to a decrease in organ function and a weakening of the immune system, making people more susceptible to various diseases. Advancing age leads to physiological alterations in the body, including the thickening of the uterine wall caused by the buildup of collagen compounds in the muscle layer. As a result, blood vessels undergo constriction and rigidity, beginning at the age of 45. Furthermore, there is an increase in peripheral resistance and sympathetic activity, accompanied by a diminished baroreceptor sensitivity that regulates blood pressure as well as the functions of the gonads, blood flow, and glomerular filtration rate[8].

The study's findings reveal that 51 respondents, or 51%, had only completed elementary school. This is in line with research Mardiana, S.S et al (2021)[9] on the relationship between education level and adherence with taking medication in hypertensive patients at the Karangrayung II Health Center, which showed significant results. This finding states that the higher the patient's education level, the higher their adherence with taking antihypertensive medication.

The study's occupation-based results reveal that 81 respondents, or 81%, were housewives.

This is in line with research conducted by Mayefis & Sari (2022)[11] which shows that most of the respondents are housewives. This shows that they tend to be more prone to stress, which results in non-adherence and a lack of attention to personal health. Women who are not working or housewives have a higher risk of suffering from hypertension compared to women who are working. This is due to a lack of physical activity, which increases the risk of being overweight and thus developing hypertension[12]. In addition, other possible factors, such as stress, can trigger an increase in sympathetic nerve activity, causing blood pressure to rise above normal.

According to Table 1, this study also examined the relationship between demographic characteristics and medication adherence. The results indicate that education and employment significantly influence patient adherence to antihypertensive therapy. Prior studies have reported a significant association between educational level and adherence[13], suggesting that lower educational levels may impede the acceptance of new information and health-related values, while higher educational attainment facilitates information processing and enhances knowledge. The findings of this study align with this, indicating that higher educational levels are associated with improved health knowledge. Employment status also significantly impacts adherence, as supported by previous studies, which indicate that employment can influence health behaviors, particularly adherence to hypertension management. Time availability appears to be a critical factor; employed individuals often have limited time to access healthcare services, potentially reducing their adherence to hypertension treatment. In contrast, unemployed individuals typically have greater flexibility, allowing more frequent engagement with available healthcare facilities for monitoring and treatment adherence.

Based on the duration of hypertension, Table 2's results reveal that 57 respondents, or 57%, experienced hypertension for less than 5 years. This is in line with research conducted by Khansa et al. (2023)[14,15] based on the length of time spent suffering from hypertension, it is known that of the 79 respondents, most had hypertension for <5 years, as many as 44 respondents (55.7%). The time since a person received a diagnosis of hypertension is known as the duration of hypertension. Contributing factors closely influence the speed at which a person develops hypertension. The more risk factors a person has, the sooner they are likely to develop hypertension, compared to those with few or no risk factors. The adherence rate of hypertension patients in Indonesia for treatment and control is quite low. The longer a person suffers from hypertension, the lower their adherence rate tends to be, as most sufferers feel bored to keep seeking treatment[16].

The findings of this study indicate that comorbidities significantly influence patient adherence to treatment, as evidenced by a p-value of 0.009 (p < 0.05). Previous study has similarly demonstrated that comorbid conditions influence patient adherence to treatment[17]. The study's comorbidity-based results reveal that 91 respondents, or 91%, have no comorbidities. Respondents who had experienced hypertension-related complications showed a higher level of adherence to treatment than those who had not experienced issues. This may be because they are more aware of the serious consequences of hypertension, so they are more disciplined when undergoing treatment.

The results of the study based on the knowledge of respondents according to the results described in Table 3. It can be seen that the low category was 24 respondents (24%), the medium category was 56 respondents (56%) and the high category was 20 respondents (20%). Knowledge influences efforts to prevent the recurrence of hypertensive disease. Risk factors for hypertension can be prevented through primary prevention measures, such as maintaining a diet to maintain ideal body weight and prevent hypercholesterolemia, and diabetes mellitus; quitting smoking; changing eating habits by eating low-salt foods; and doing exercises to control body weight. If certain factors have already established a person's hypertension, secondary prevention becomes necessary. These measures include comprehensive management of the patient, both with medication and measures such as primary prevention, to keep blood pressure normal or stable, control other risk factors for ischemic heart disease, and limit activity[18].

The study's results on respondent adherence show that 77 respondents (77%) were non-adherence, while 23 respondents (23%) were adherence. Wulansari et al. (2024) found that out of 90 respondents, 84 had low results (92.3%), 4 had moderate results (4.4%), and 2 had high results (2.2%). Non-adherence will lead to suboptimal drug use. As a result, patients lose the benefits of therapy, and their condition may gradually deteriorate. Adverse reactions may occur if patients use an excessive dose or take the drug more frequently than recommended[20].

The results of the study were based on the knowledge of respondents, according to the results described in Table 3. Table 3 reveals that 24 respondents (24%), 56 respondents (56%), and 20 respondents (20%) belonged to the low category. Patients who possess knowledge about hypertension, including its causes, development, and control, along with the treatment process, can enhance their self-control and awareness, leading to greater adherence with their treatment regimen. In the

treatment of chronic diseases like hypertension, adherence is crucial as it enables the use of adherence antihypertensive drugs to produce long-term blood pressure control effects and prevent various potential complications[21].

Various factors can cause hypertension patients to not take their medication at the public healthcare facility. One of them is a lack of understanding about the importance of maintaining adherence in hypertension treatment. This study reveals that patient knowledge of hypertension significantly influences patient medication edherence to therapy. The more obedient or routine a person is in taking hypertension medication, the more he will realize that adherence with taking hypertension medication is very beneficial for his health.

The variables that will be analyzed multivariately are confounding factors, such as gender, age, education, occupation, length of suffering, and comorbidities, with the dependent variable being adherence to taking antihypertensive medication. The multivariate analysis will include education (p-value 0.041), occupation (p-value 0.024), and comorbidities (p-value 0.009) in Tables 1 and 2, as these variables have p-values less than 0.25. The results of the logistic regression analysis in the first step showed that the confounding variables, namely education (p-value 0.397) and occupation (p-value 0.394), were not significant because the p-value was greater than 0.05. The confounding variable is comorbidities (p-value 0.003), which is significant because the p value is less than 0.05.

Table 5 presents the final stage of the logistic regression analysis within the multivariate analysis. The results of this multivariate analysis indicate that the comorbidity variable has a significant impact on patient adherence to treatment, with a p-value of 0.007 (p < 0.05), demonstrating a statistically significant relationship. The regression coefficient (B) of -0.820 suggests a negative association, indicating that the presence of comorbidities tends to decrease patient adherence. The Odds Ratio (OR) of 0.441 indicates that patients with comorbidities are 0.441 times less likely to adhere to treatment compared to patients without comorbidities. The 95% Confidence Interval (CI) for the OR, ranging from 0.242 to 0.801, does not cross the value of 1, further supporting the significant association between comorbidities and adherence. Previous study have indicated that the number of comorbidities can increase the risk of patient non-adherence to treatment, patients with a higher burden of comorbidities tend to be less adherence[22].

Conclusion

This study concludes that patient knowledge about hypertension influences adherence to antihypertensives in public healthcare. Comorbidity, with a p-value of 0.007 and the highest OR of 0.801 times more obedient in taking medication, is the most influential risk factor.

Conflict of Interest
None declared.

References
1. Hypertension. Https://Www.Who. Int/News-Room/Fact-Sheets/Detail/ Hypertension.
2. Dolo, L. S., Yusuf, A. & Azis, R. ANALISIS FAKTOR MEMENGARUHI KEPATUHAN BEROBAT LANSIA

PENDERITA HIPERTENSI PADA MASA PANDEMI COVID-19 DI PUSKESMAS BULILI KOTA PALU. PREPOTIF : Jurnal Kesehatan Masyarakat 5, 828–842 (2021).

3. Wirakhmi, I. N. & Purnawan, I. HUBUNGAN KEPATUHAN MINUM OBAT DENGAN TEKANAN DARAH PADA PENDERITA HIPERTENSI. Jurnal Ilmu Keperawatan Dan Kebidanan 12, Undefined-Undefined (2021).

4. Apsari, D. P. & Wintariani, N. P. Hubungan Antara Pengetahuan Pasien Dan Kepatuhan Minum Obat Antihipertensi Di Puskesmas Mengwi I. Widya Kesehatan 4, 55–62 (2022).

5. Artaviachika, N. D. Gambaran Tingkat Pengetahuan Tentang Hipertensi Pada Pasien Hipertensi Di Puskesmas Karangtengah Dan Puskesmas Demak Iii Kota Demak. (Universitas Islam Sultan Agung Semarang, 2022).

6. Kurniawati, D. & Fajriannor, M. Hubungan Tingkat Pengetahuan Dengan Kepatuhan Minum Obat Anti Hipertensi Pasien Di Puskesmas Bangkuang Kalimantan Tengah. Jurnal Farmasi SYIFA 1, 85–90 (2023).

7. Yunus, M., Aditya, I. W. C. & Eksa, D. R. Hubungan Usia Dan Jenis Kelamin Dengan Kejadian Hipertensi Di Puskesmas Haji Pemanggilan Kecamatan Anak Tuha Kab. Lampung Tengah. Jurnal Ilmu Kedokteran Dan Kesehatan 8, 229–239 (2021).

8. Widjaya, N., Anwar, F., Sabrina, R. L., Puspadewi, R. R. & Wijayanti, E. Hubungan Usia Dengan Kejadian Hipertensi Di Kecamatan Kresek Dan Tegal Angus, Kabupaten Tangerang. Jurnal Kedokteran YARSI 26, 131–138 (2018).

9. Mardiana, S. S., Faridah, U., Subiwati, S. & Wibowo, B. D. Hubungan Tingkat Pendidikan Dengan Kepatuhan Minum Obat Pada Pasien Hipertensi Di Puskesmas Karangrayung II. In Prosiding University Research Colloquium 628–635 (2021).

10. Mayefis, D. & Sari, Y. S. Hubungan Karakteristik Pasien Hipertensi Dengan Kepatuhan Minum Obat Di UPT Puskesmas Meral Kabupaten Karimun Tahun 2020. SEHATMAS: Jurnal Ilmiah Kesehatan Masyarakat 1, 266–278 (2022).

11. Mayefis, D., Suhaera & Sari, Y. S. Hubungan Karakteristik Pasien Hipertensi Dengan Kepatuhan Minum Obat Di UPT Puskesmas Meral Kabupaten Karimun Tahun 2020. SEHATMAS: Jurnal Ilmiah Kesehatan Masyarakat 1, 266–278 (2022).

12. Bisnu, M. I. (M), Kepel, B. (Billy) & Mulyadi, N. (Ns). Hubungan Dukungan Keluarga Dengan Derajat Hipertensi Pada Pasien Hipertensi Di Puskesmas Ranomuut Kota Manado. Jurnal Keperawatan UNSRAT 5, 108807 (2017).

13. Mardiana, S. S., Faridah, U., Subiwati, S. & Wibowo, B. D. Hubungan Tingkat Pendidikan Dengan Kepatuhan Minum Obat Pada Pasien Hipertensi Di Puskesmas Karangrayung II. In Prosiding University Research Colloquium 628–635 (Prosiding University Research Colloquium, 2021).

14. Khansa, F., Utomo, W. & Nurchayati, S. Hubungan Tingkat Pengetahuan Dan Aktivitas Fisik Dengan Tekanan Darah Pada Penderita Hipertensi. JUKEJ: Jurnal Kesehatan Jompa 2, 137–151 (2023).

15. Khansa, F., Utomo, W. ' & Nurchayati, S. '. Hubungan Tingkat Pengetahuan Dan Aktivitas Fisik Dengan Tekanan Darah Pada Penderita Hipertensi. JUKEJ : Jurnal Kesehatan Jompa 2, 137–151 (2023).

16. Adyani, S. A. M. & Mahardika, M. Motivasi Klien Dengan Kepatuhan Minum Obat Pada Penderita Hipertensi. Jurnal Keperawatan Widya Gantari Indonesia 7, (2023).

17. Rikmasari, Y., Rendowati, A. & Putri, A. Faktor-Faktor Yang Mempengaruhi Kepatuhan Menggunakan Obat

Antihipertensi: Cross Sectional Study Di Puskesmas Sosial Palembang. Jurnal Penelitian Sains 22, 87 (2020).

18. Priyadarsani, A. M. A., Sutresna, I. N. & Wirajaya, I. G. Hubungan Tingkat Pengetahuan Tentang Hipertensi Dengan Upaya Pencegahan Kekambuhan Hipertensi Pada Lansia. Jurnal Media Keperawatan: Politeknik Kesehatan Makassar 12, (2021).

19. Wulansari, D., Penulis, D. N. P. S. & Septimar, Z. M. Hubungan Tingkat Pengetahuan Dan Kepatuhan Minum Obat Hipertensi Terhadap Pencegahan Hipertensi Di Puskesmas Pasar Kemis. Jurnal Dunia Ilmu Kesehatan (JURDIKES) 2, 24–33 (2024).

20. Rispawati, B. H. Hubungan Kepatuhan Minum Obat Anti Hipertensi Dengan Kekambuhan Pasien Hipertensi Di Ruang Poli Rumah Sakit Harapan Keluarga Mataram. Jurnal Ilmu Kesehatan Mandira Cendikia 3, 31–38 (2024).

21. Dhrik, M., Prasetya, A. A. N. P. R. & Ratnasari, P. M. D. Analisis Hubungan Pengetahuan Terkait Hipertensi Dengan Kepatuhan Minum Obat Dan Kontrol Tekanan Darah Pada Pasien Hipertensi. Jurnal Ilmiah Medicamento 9, 70–77 (2023).

22. Oh, O. & Lee, K. S. For Hypertensive Patients With Comorbidity, The Number Of Comorbidity Is Associated With The Pattern Of Their Medication Adherence. European Journal Of Cardiovascular Nursing 21, (2022).

Table 1. Socio-demographics of patient with hypertension

Sociodemographics data	Criteria	n(%)	P value
Gender	Man	22 (22)	0,534
	Women	78 (78)	
Age	20-30 Years	2 (2)	0,879
	31-40 Years	5 (5)	
	41-50 Years	31 (31)	
	51-60 Years	62 (62)	
Last Education	Primary school	51 (51)	0,041*
	Junior High School	16 (16)	
	Senior High School	27 (27)	
	College	4 (4)	
	No school	2 (2)	
Occupation	Civil Servant	3 (3)	0,024*
	Private Employee	4 (4)	
	Self-employed	2 (2)	
	Laborer	2 (2)	
	Retired	0 (2)	
	Housewife	81 (81)	
	Others	8 (8)	

*p-value < 0.05 indicates a significant association between patient demographic characteristics (last education and occupation) and adherence to antihypertensive medication

Table 2. Condition of patient with hypertension

Condition	Criteria	n(%)	P value
Duration of Hypertension	< 5 Years	57	0,136
	> 5 Years	43	
Comorbidities	Diabetes	6	0,009*
	Heart disease	1	
	Stroke	2	
	None	91	

*p-value < 0.05 indicates a significant association between patient comorbidities and adherence to antihypertensive medication.

Table 3. Category of Knowledge and Adherence to Antihypertensive

Data	Categories	N(%)
Knowledge	Low	24(24)
	Medium	56 (56)
	High	20 (20)
Adherence	Non-adherence	77 (77)
	Adherence	23 (23)

Table 4. Relationship between Knowledge Level and Adherence Level of Taking Anti-hypertensive Medication

Variables	Adherence				Total	p- value
	Adherence		Non- Adherence			
	F	%	F	%		
Knowledge						
Low	8	8	16	16	24 (24%)	
Medium	6	6	50	50	56 (56%)	0,003*
High	11	11	9	9	20 (20%)	
Total	**25**	**25**	**75**	**75**	**100 (100%)**	

*p-value of <0.05 indicates a statistically significant association between knowledge and treatment adherence

Table 4. Relationship between Knowledge Level and Adherence Level of Taking Anti-hypertensive Medication

Variable	B	Wald	Sig.	OR	95% CI	
					Lower	Upper
Comorbidities	-0,820	7,217	0,007	0,441	0,242	0,801