



RELATIONSHIP BETWEEN KNOWLEDGE HYPERTENSION COMPLICATIONS AND MEDICATION ADHERENCE AMONG ELDERLY WITH COMORBIDITIES

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ABSTRACT

Hypertension continues as a distinct global health issue and is associated with the risk of developing multiple complications, as well as premature death. The high prevalence of hypertension at the global and national level, as well as low awareness and poor control in elderly patients with comorbidities typifies a major challenge to hypertension control. Knowledge on the complications of hypertension is assumed to significantly contribute to medication adherence behavior. This research was conducted with the purpose of investigating the correlation between knowledge level on complications caused by hypertension and medication adherence behavior in hypertensive patients who have comorbidities at Kartasura Health Center. Study Design This is a quantitative study with correlational design method and cross-sectional approach. The sample of this study was 70 respondents taken with total sampling technique. Data collection was done with a questionnaire measuring knowledge of hypertension complications using the Guttman scale (15-items) and Morisky Medication Adherence Scale-8 (MMAS-8) to measure the medication adherence. The results of the validity and reliability tests indicated that the hypertension complication knowledge questionnaire demonstrated a validity coefficient of $r = 0.349$ and a reliability coefficient of 0.70812, indicating that the instrument was valid and reliable. Meanwhile, the Morisky Medication Adherence Scale-8 (MMAS-8) showed a validity value of $p = 0.5$ and a reliability coefficient of 0.83, confirming that the instrument was valid and highly reliable for measuring medication adherence. Analyses were completed with univariate and bivariate analysis, and the use of a Spearman rank correlation test (significance level was set at $\alpha = 0.05$). Among the respondents, majority of them had a good level of knowledge on complications associated with hypertension (47.14%) and over half of them also had a low medication adherence rate (54.29%). A strong and statistically significant positive relationship between the knowledge level of hypertension complications and drug adherence were found according to the Spearman's rank correlation test ($\rho = 0.680$, $p = 0.001$). The more knowledge the subjects had, the more tended to be adherence to antihypertensive medications. The level of knowledge about complications in hypertension showed a strong association with drug adherence among elderly patients with comorbidities.

Keywords: comorbidities; complication; elderly; hypertension; knowledge; medication adherence

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INTRODUCTION

Hypertension is a major global health challenge and an important risk factor for several complications, affecting about 1.28 billion adults aged 30–79 years worldwide, two thirds of whom reside in middle-income countries and resource-poor areas. Of those, 46% don't know they have it; only 42% have been diagnosed and treated, with a mere 21% getting their hypertension under control. It is not surprising then that high blood pressure has become a leading avoidable risk for premature mortality and there exists the world's first global target for noncommunicable diseases (including to end the rise in raised BP and if it does not already exist then also one to reduce by 33% the prevalence of raised BP from 2010–2030) (WHO, 2023). Based on the 2018 Riskesdas, percentage of hypertensive persons in Central Java amounted to 37.57%, while prevalence rate was 40.17%% women and 34.83% men. However, the urban prevalence rates were slightly higher (38.11%) compared to rural areas (37.01%), and increased with increasing age (Central Java Health Profile 2021, n.d.).

Hypertension is a killer, with 90–95% of cases caused by primary hypertension, ranking fourth in the country as the greatest risk for death (10.2%) and contributing vastly to >15 years also disability due to non-communicable disease according to data from main health problem and non-communicable disease prevalence morbidity status survey Indonesia 2023 and cohort study on non-communicable diseases in Indonesian population year 2011–2021 (Ministry of Health, 2024). According to preliminary study at the Kartasura Community Health Center on 18 September 2025, presented from January until August 2025 recording were in total 681 visits of hypertension with other diseases. It was based on these visits that a total of 176 hypertensive elderly individuals with comorbidities visited the Kartasura Community Health Center to undergo examinations in August 2025. Based on interviews with the 10 Respondents, patients hypertensive comorbid awareness about complications suffered by 60%, while the remaining 40% realized that there were risks of any complications experienced..

Hypertension is one of cardiovascular disease (CVD) that most frequently occurs, mostly suffered by the elderly (Ministry of Health of the Republic of Indonesia, 2019). Ninety-five percent of all hypertension are of essential type (EHT), that is a complex hemodynamic and structural disorder with several other contributing factors, characterized by the overall elevation in systolic blood pressure (SBP) to ≥ 140 mmHg and/or diastolic blood pressure (DBP) to ≥ 90 mmHg (Franco, 2022). The development of knowledge has progressed remarkably over time. Humans are born with various special qualities, and one of these qualities is curiosity (Notoatmodjo, 2018). This curiosity drives humans to explore new things and uncover the connections between facts or phenomena and existing theories (Jasmin et al., 2023). Knowledge, which is a noun formed from the root word tahu with the affix pe-an and means everything related to the process of understanding, encompasses all activities, methods, means, and results of the process of knowing an object. It becomes mental wealth stored in the minds and hearts of humans, which is then communicated through social interaction so that it enriches each other, and can be documented in various media such as books, cassettes, disks, works, and habits that can be passed down from generation to generation. (Octaviana & Ramadhani, 2021).

Hartono explains that compliance is the transformation of an individual's attitude and actions in following instructions or requests from others, so that obedience can be interpreted as recognition of instructions from others (Dewi, 2020). Patient compliance in taking or using medication as medically recommended can at least improve metabolic control, quality of life, and reduce hospitalization rates (Huang, 2021). This study was conducted to determine the relationship between the level of knowledge of hypertension complications and medication adherence behavior in elderly people with hypertension and comorbidities, so as to fill the research gap related to the function of patient understanding in adherence to therapy among the elderly population with comorbidities, while also serving as a basis for designing more targeted educational interventions to improve medication adherence and prevent the onset of hypertension complications.

METHOD

This is a correlational study which employed quantitative approach of data and it is cross-sectional in nature. The study was carried out at Kartasura Community Health Center, Sukoharjo Regency. Data were collected from June to December 2025 in accordance with the prolanis timetable and at the medication waiting room. The subjects were elderly hypertensive patients with comorbidities who visit the Kartasura Community Health Center. The approach sampling that used was total sampling where the entire population that is eligible to be included as a research sample. Seventy respondents were obtained from this procedure by Slovin's formula at a level of accuracy 10.2%. The inclusion criteria in this study included: (1) hypertensive patients over 60 years of age, (2) suffering from comorbidities, (3) registered and undergoing examination at the Kartasura Community Health Center, (4) able to communicate well, and (5) willing to participate as research respondents by signing a consent form. Meanwhile, the exclusion criteria were aimed at patients

who had serious cognitive impairments or health conditions that prevented them from completing the questionnaire.

Data collection was conducted using two questionnaires, namely a questionnaire on knowledge of hypertension complications and a questionnaire on medication adherence. The knowledge questionnaire was developed based on health indicators and applied the Guttman scale, which included 15 questions with true or false answer options. The statements consisted of favorable and unfavorable ones, with a scoring system using a score of 1 for correct answers and a score of 0 for incorrect ones. The scores obtained were then categorized into three knowledge groups: good, adequate, and poor. The hypertension complication knowledge questionnaire showed a validity coefficient of $r = 0.349$ and a reliability coefficient of 0.70812, indicating that the instrument was both valid and reliable, according to the findings of the validity and reliability tests. The questionnaire was deemed suitable for evaluating patients' understanding of hypertension problems in light of these findings.

On the other hand, medication adherence behavior is measured using the Morisky Medication Adherence Scale-8 (MMAS-8) questionnaire, which uses a Likert scale. This questionnaire contains 8 questions that reflect the habits, suitability, and compliance of respondents in the use of antihypertensive drugs. The Morisky Medication Adherence Scale-8 (MMAS-8), which employs a Likert scale, was used to measure medication adherence behavior. Eight items make up this questionnaire, which reflects respondents' antihypertensive medication habits, appropriateness, and compliance. The reliability coefficient was 0.83 and the validity test yielded a p-value of 0.5, suggesting that the MMAS-8 was both highly reliable and valid. The statements presented include favorable and unfavorable items with a scoring system. Based on the total score achieved, medication adherence was grouped into two categories, namely good and poor adherence, using the median value to determine the category boundaries.

Data analysis was performed in stages, including univariate and bivariate analyses. Univariate analysis aimed to describe the characteristics of respondents and the distribution of knowledge and medication adherence levels, presented in the form of frequencies and percentages. For bivariate analysis, the objective is to evaluate the relationship between the level of knowledge of hypertension complications and medication adherence behavior using the Spearman's rank correlation test, which is suitable for ordinal data. The level of statistical significance is determined at $\alpha = 0.05$.

RESULT

Seventy elderly HTN patients with comorbidities who visited the Kartasura Community Health Center partook in this study. In terms of gender, no details about the sex were reported in 3 refugee while most (45 people; 64.29%) were women and then 25 (35.71%) men. The majority of respondents ($n = 47$, 67.14%) were older than 65 years while part of the people ($n = 23$, 32.86%) were from age group 60–65 years. In terms of education, respondents showed various educational backgrounds, ranging from never having attended school to diploma level education, with the largest proportion coming from respondents with elementary education.

Results of the assessment revealed that patients were classified into poor, moderate and good level of knowledge regarding complications of hypertension. A greater number of the subjects ($n = 33$; 47.14%) demonstrated good knowledge followed by moderate knowledge (30; 42.86) and low level of knowledge (7; 10%). This distribution demonstrates that the knowledge of the majority of participants about complication was satisfactory, as there remains a low percentage who have no clear conception on the complications associated with uncontrolled blood pressure.

Table 1.
Distribution of Knowledge Levels

Knowledge level	f	%
Good	33	47.14
Fair	30	42.86
Insufficient	7	10

According to the results of the questionnaire MMAS-8, 32 subjects (45.71%) had adherence score in the compliance area and 38 subjects (54.29%) were in noncompliance range.

These results show that many respondents do not take antihypertensive drugs optimally while other respondents had enough or good information.

Table 2.
Distribution of Compliance Levels

Compliance Level	f	%
Good	32	45.71
Poor	38	54.29

The findings of bivariate analysis with Spearman's rank correlation test showed that, there was a strong positive association between knowledge on complications of hypertension and medication adherence with the correlation coefficient (ρ) being 0.680.

The p-value recorded is 0.001 ($p < 0.05$), which means this relationship is statistically significant. This implies that the greater the awareness of hypertensive complications among participants, the more likely that they are to be compliant taking antihypertensive medications.

Table 3.
Relationship between Knowledge of Hypertension Complications and Medication Adherence Behavior

Compliance	Knowledge				Total
	Good		Fair		
	f (%)	f (%)	f (%)	f (%)	f (%)
Good	23 46	6 12	2 4	31 62	
Poor	6 12	20 32	3 6	19 38	
Total	29 58	26 32	5 10	50 100	
<i>Rho</i>	0.680				
<i>p-value</i>	0.001				

DISCUSSION

Table 3 shows that there was a strong positive correlation difference between knowledge on problems of hypertension and adherence to medication among hypertensive elderly without any other diseases ($\rho = 0.680$, $p=0.001$). Individuals with good knowledge were more likely to be adherent to drug treatment than those with adequate or poor knowledge. Most respondents were in the good and adequate knowledge categories, which theoretically contributes to the formation of positive attitudes and health behaviors, including adherence to treatment. Adequate knowledge about the risks and complications of hypertension can encourage patients to be more diligent in undergoing long-term therapy (Shiraly et al., 2022).

However, most of the surveyed individuals still fall into the low compliance category despite having adequate to good levels of knowledge. These results indicate that knowledge is not the only factor influencing adherence, given that hypertension often does not show symptoms, which can reduce understanding of the seriousness of the condition (Arini, 2024). The presence of individuals with adequate or insufficient knowledge who are still compliant proves that compliance is also influenced by other factors, such as perceptions of the benefits of treatment, motivation, family support, and access to health services, as explained in the Health Belief Model and the COM-B model (Patade, 2025); (Park LG, 2023); (Alyafei & Easton-Carr, 2024).

Overall, the findings of the study suggest that enhancing awareness to the consequences of hypertension is highly significant in terms of controlling medication adherence but needs complementation by holistic interventions for psychosocial and health-services aspects (Guo et al., 2023). Individualized and continuous education activity is a key to enhance public compliance to treatment and to avoid the long-term complications resulted from hypertension (Arini, 2024).

CONCLUSION

The results of this study showed that comprehension levels of hypertension complication have a sufficient and significant relationship with adherence to medication in elderly people who have hypertension and other diseases at the Kartasura Community Health Center. Well, overall the more you know, people tend to be taking their medications like they are supposed to. There are, however still many people with adequate (or good) levels of knowledge but low adherence. This mean that adherence is not only information based accessible but also it's affected by other elements such as motivation, believed benefit, family support and easy access to health services. Accordingly, in elderly hypertensive patients, a systematic and continuous health education intervention accompanied by psychosocial support and medical services is required to enhance the adherence to medicine for control of complications caused by hypertension.

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