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Analysis of Factors Affecting Compliance Taking Medicine for Elderly Hypertension Based Health Belief Models

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ABSTRACT

Entering old age, more and more diseases attack the elderly, including high blood pressure. Most people with hypertension don't know they have hypertension because it has no symptoms, so it's often called the silent killer. Elderly people must adhere to treatment in cases of hypertension, especially by taking antihypertensive drugs. The problem faced by elderly people with hypertension is that most do not adhere to their medication. The behavior of following a doctor's advice comes from beliefs or perceptions. The health belief model is one of the theories based on faith. This study aimed to analyze the factors affecting medication adherence in the elderly with hypertension as a function of health belief regimen. This study uses a type of quantitative research. The study design used descriptive analysis with a cross-sectional design. The study population consisted of 107 elderly people with a sample of 100 elderly people with hypertension in the work area of Jenggawah Primary Health Center. The study will be conducted from April to May 2023. The instrument used in the study is a questionnaire. Based on the test results by SPSS using a logistic regression test with α of 0.05, perceived susceptibility p-value of 0.003, p-value of perceived severity of 0.036, p-value of perceived benefit is 0.682 observed, perceived barriers are found to be p-value 0.216, self-efficacy p value 0.081, cues to action p value 0.746. Based on the study results, it can be concluded that there is an influence of the perception of susceptibility and the perception of severity on the adherence to drug treatment in the elderly with hypertension.

KEYWORDS

Elderly, Hypertension, Health Belief Mode, Medication adherence,

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1. BACKGROUND

The elderly are a vulnerable group that experiences health problems due to decreased function, including physiological function (Widyastuti & Ayu, 2019). Increasing age causes blood pressure to increase. Most people with high blood pressure don't know they have high blood pressure because it has no symptoms. This is why it is often referred to as the silent killer.

Older adults should be treated for high blood pressure, including antihypertensive medication. Anti-hypertensive drugs are taken for life because only controlling blood pressure cannot cure hypertension. Hypertension that does not receive proper treatment can cause complications such as stroke and heart disease (Indonesian Ministry of Health, 2020). The problem experienced by the elderly with hypertension is that the majority of them do not adhere to taking medication.

According to WHO, an estimated 1.13 billion people worldwide suffer from hypertension (WHO, 2022). The prevalence of hypertension is increasing, especially due to the aging population over 80 years which has developed over the last 40 years (Silvanasari et al., 2022). The estimated number of hypertension cases in Indonesia is around 63,309,602 with a death rate of 427,217, where hypertension cases in the 55-64 years age group (55.2%) are the age group with the highest prevalence (Indonesian Ministry of Health, 2018). The prevalence of elderly hypertension in East Java in 2020 is 35.6 % or around 3,919,489 residents. According to the Jember District Health Center standards in 2021, the percentage of hypertension sufferers who received health services was 35.07% of the 762,449 people with hypertension (Lailiyah et al., 2021). Based on data from Posbindu PTM at the Jenggawah Health Center in January-March 2023 there were 107 hypertensive elderly.

Based on research conducted by Afina at Posbindu Sumber Sehat, Kangkung Miranggeng Village, as many as 63.5% of the elderly had a low adherence level to anti-hypertension medication. Based on research conducted by Proboningsih in the working area of the Pacar Keling Health Center in Surabaya, 90% of elderly hypertensives do not adhere to treatment (Massa, 2021). Research conducted by Rahmad at the Sikka District Hospital, NTT obtained high compliance of 42.1%, moderate adherence of 40%, and low adherence of 30% meaning that there are still many hypertensive patients with low levels of adherence (Rahmad & Purnama, 2022).

The impact of non-compliance with medication is that the side effects of drugs that are detrimental to health, medical costs, and hospitals are swelling. Non-adherence of hypertensive elderly causes uncontrolled blood pressure, increasing medical costs if complications occur in hypertension (Pramesti et al., 2020). Compliance with taking medication is a health behavior that elderly people with hypertension must carry out to prevent this

impact (Made et al., 2020). The behavior of complying with doctor's recommendations originates from beliefs or perceptions (Soesanto & Marzeli, 2020). The perception of the elderly with hypertension does not need special treatment, are easy to recover, do not need medication, and the normal limit is higher as they age. Wrong assumptions mean that hypertension is often ignored and not treated seriously. Patients feel that hypertension medication is unnecessary and choose traditional medicine (Paramitha et al., 2017). Compliance with taking medication is a behavior based on belief. The theory of Planned Behavior, Self-Efficacy, and Health Belief Model is belief-oriented. The Health Belief Model can identify health behaviors, including medical adherence, individual program participation, and prevention behaviors. Based on the results of research conducted by Riza Yulina Amry (2021) at the White Lotus 1 Posyandu Pungkuran Pleret Bantul, it was found that two of the five components had a significant effect on adherence to taking antihypertensive medication with perceived benefits and barriers being factors that significantly influence adherence taking antihypertensive medication (Amry et al., 2021).

The health belief model describes changes in health behavior focusing on perceptions or beliefs about disease. The health belief model comprises six components: perceived susceptibility, perceived severity, perceived benefit, perceived barrier, cues to action, and self-confidence. efficacy) (Berhimpong et al., 2020). Perception of vulnerability is a person's belief regarding their vulnerability to disease. This perception encourages behavior to reduce vulnerability. Perceived severity is a person's belief in the severity of the disease and the impact of the disease. Perceived benefit is a person's belief in the benefits obtained when carrying out a behavior. Perception of obstacles is a component that hurts behavior. Instructions for action are events that can increase a person's motivation to change behavior. Self-efficacy is the self-confidence of hypertension sufferers in making therapeutic decisions (Berhimpong et al., 2020). Based on the problems above and supported by various data and sources researched Factors that Influence Medication Adherence in Hypertensive Elderly Based on the Health Belief Model.

2. METHODS

The research design used descriptive analytics with cross-sectional design. The population of this study were 107 elderly people with hypertension who consumed hypertension medication at the Jenggawah Primary Health Center. This research uses probability sampling with proportionate random sampling. The sample in this study was 100 hypertensive elderly people in the Jenggawah Community Health Center working area, divided into 3 working areas, namely Jenggawah 28 elderly people, Wonojati 52 elderly people, And 20 elderly people. The exclusion criteria in this study were not willing to sign informed consent, deaf elderly, and stroke.

The variables in this study include perceptions of vulnerability, perceptions of seriousness, perceptions of obstacles, perceptions of benefits, cues to action, self-efficacy, and adherence to taking hypertension medication. The type of instrument used in the research is a questionnaire consisting of demographic data, HBM, and the Medication Morisky Adherence Scale-8 (MMAS) questionnaire. This research uses an ordinal logistic regression test.

This research was conducted in April-May 2023 and declared ethically feasible by the certificate number issued by KEPK Universitas dr Soebandi 066/KEPK/UDS/III/2023.

3. RESULTS

The characteristics of elderly hypertensive respondents in research in the Jenggawah Primary Health Center working area were gender, age, ethnicity, education, occupation, income, length of time suffering from hypertension, and diseases other than hypertension. The characteristics of the respondents can be seen in the following table.

Table 1. Respondent Characteristics *(continue to page 251)*

Characteristics of Respondents	Frequency (n)	Percentage (%)
Gender		
Woman	77	77
Man	23	23
Age		
60-66 years	56	56
67-73 years	49	49
Tribes		

Characteristics of Respondents	Frequency (n)	Percentage (%)
Madurese	82	82
Java	18	18
Education		
Elementary school	51	51
No school	49	49
Work		
Farmer	39	39
Doesn't work	61	61
Income		
<1,000,000	61	61
1,000,000-3,000,000	39	39
Suffering from hypertension for a long time	18	18
last 3 months	11	11
3-5 months	11	11
5-12 months	20	20
1-2 years	24	24
2-5 years	15	15
5-10 years	1	1
>10 years		
Diseases other than hypertension		
There isn't any	72	72
Cholesterol	15	15
Gout	13	13

Based on table 1 shows the demographic characteristics of the respondents who participated in the study as many as 100 hypertensive elderly in the working area of the Jenggawah Primary Health Center. The data shows that the majority of the elderly are female, 77 people (77%), with the age group of 60-66 years, 56 people (56%), Madurese 82 people (82%), and the last education level SD, 51 people (51%), not working as many as 61 people (61%). Most respondents suffered from hypertension for 2 -5 years as many as 24 people (24%).

The health belief model data in this study describes the perceptions of the elderly in the work area of the Jenggawah Primary Health Center, Jember Regency, who suffer from hypertension regarding perceptions of vulnerability, perceived severity, perceived benefits, perceived obstacles, self-efficacy, and cues to act.

Table 2. Description *of Health Belief Model*

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Health Belief Model	Low		Currently		High	
	f	%	f	%	f	%
Perception of susceptibility	26	26	56	56	16	16
Perception of severity	25	25	54	54	18	18
Perception of benefits	2	2	59	59	39	39
Perception of barriers	30	30	51	51	19	19
Self-efficacy	24	24	62	62	14	14
Cue to action	7	7	66	66	27	27

Based on table 2, it shows that the majority of elderly people have moderate perceived vulnerability of 56%, moderate perceived severity of 54%, moderate perceived benefits of 59%, moderate perceived obstacles of 51%, moderate perceived confidence of 62%, cues to act moderately of 66%.

Table 3. Description of Compliance with Medication

Medication Adherence	*f*	*%*
Low	19	19
Currently	65	65
High	16	16

Table 3 shows respondents have low medication adherence of 19%, moderate compliance of 65%, and high adherence of 16%.

Table 4. Influence of Perceived Susceptibility on Medication Adherence

Perception of susceptibility	Medication Adherence			N	%	B	P *-value*	OR	R *square*
	Low	Currently	High						
Low	8	18	0	26	26				
Currently	9	40	7	56	56	-1,757	0.003	0.17	0.182
High	2	7	9	18	18				

Table 4 shows a p-value of 0.003 < α 0.05, which shows a significant influence between perceived susceptibility and compliance with taking medication in hypertensive elderly. Obtaining an OR value of 0.17, it can be concluded that elderly people with moderate perceived susceptibility have 0.17 times greater compliance with taking medication compared to elderly people who have low and high perceived vulnerability. An R square value of 0.182 was obtained, meaning that perceived vulnerability had an influence of 18.2 % on medication adherence in hypertensive elderly.

Table 5. Influence of Perceived Severity on Compliance with Medication

Perception of Severity	Medication Compliance			N	%	B	P *-value*	OR	R *square*
	Low	Currently	High						
Low	8	16	1	25	25				
Currently	9	34	11	54	54	-1,313	0.036	0.27	0.072
High	2	15	4	21	21				

Based on table 5, it shows p-value 0.036 < α 0.05. This shows a significant influence between perceived severity and adherence to medication in hypertensive elderly. Obtained an OR value of 0.27 meaning that the elderly with a moderate perception of severity have compliance 0.27 times greater than the elderly who have a low and high perception of severity. The results found that the R square was 0.072, which means that the perception of severity influences 7.2 % of adherence to medication in the elderly with hypertension.

Table 6. Influence of Perceived Barriers on Compliance with Medication

Perceived Barriers	Medication Adherence			N	%	B	P *-value*	OR	R *square*
	Low	Currently	High						
Low	8	17	5	30	30				
Currently	8	37	6	51	51	-0.752	0.216	0.47	0.018
High	3	11	5	19	19				

Based on table 6 shows the p-value 0.216 > α 0.05. This shows no influence between perceptions of barriers and medication adherence.

Table 7. The Effect of Self-Efficacy on Medication Adherence

Self-Efficacy	Medication Compliance			N	%	B	P -value	OR	R square
	Low	Currently	High						
Low	4	19	1	24	24				
Currently	13	39	10	62	62	-1,216	0.081	0.29	0.038
High	2	7	5	14	14				

Based on table 7, it shows p-value 0.081 > α 0.05. This shows that there is no influence between self-efficacy and medication adherence.

Table 8. Effects of Cues to Act on Adherence to Taking Medication

Cue To Action	Medication Compliance			N	%	B	P -value	OR	R square
	Low	Currently	High						
Low	0	7	0	7	7				
Currently	11	47	8	66	66	-0.152	0.746	0.85	0.001
High	8	11	8	27	27				

Based on Table 8, which shows a p-value of 0.746 > α 0.05, it can be concluded that there is no influence between cues to act and compliance with taking medication.

Table 9. The Most Influential Factors in Medication Adherence

Health Belief Model	p-value	R square	Information
Perception of susceptibility	0.003	0.182	Influential
Perception of Severity	0.036	0.072	Influential
Perceived Benefit	0.682	0.049	No effect
Perceived Barriers	0.216	0.018	No effect
Self-Efficacy	0.081	0.038	No effect
Cues To Action	0.746	0.001	No effect

Based on table 9, shows that 2 factors have the most influence on medication adherence in elderly people with hypertension, namely perception of vulnerability and perception of severity. Perceived vulnerability has the greatest influence on adherence to medication in the elderly with hypertension by 18.2 %. Perceived severity has a second effect on medication adherence in elderly hypertensives of 7.2 %. Other factors such as perceived benefits, obstacles, self-efficacy, and cues to act do not affect medication adherence in elderly hypertensives because they have a small effect. The results of multiple regression analysis with fatigue at the end of night shifts as the object variable are shown in Table 6. The R2 for the optimal model was .491 and the adjusted R2 was .464. The causes of increased fatigue at the end of the night shift were country of residence (working in Japan), sleep quality (poor), disposition to the Qi-deficiency constitution, and disposition to the Yang-deficiency constitution.

4. DISCUSSION

The Effect of Perceived Vulnerability on Medication Adherence

The majority showed that the elderly perceived moderate vulnerability, as much as 56%. Perception of vulnerability shows a p-value of 0.003 < α 0.05, this shows that there is a significant influence between perception of vulnerability and compliance with taking medication in hypertensive elderly. By research results that perceived vulnerability has a positive direction with medication adherence (p-value = 0.05), it can be concluded that the higher the perceived susceptibility to hypertension complications, the higher the medication adherence (Wijaya et al., 2018). According to the HBM theory, it describes the perceived susceptibility to complications of hypertension that a person will behave healthily if they believe that hypertension can cause complications. A person will take action to reduce, prevent, and control health problems when the individual thinks they

will be vulnerable to that condition (Amry et al., 2021).

Elderly people have a moderate perception of moderate adherence to taking medication because elderly people who are no longer young feel that they are vulnerable to disease. Body functions will weaken so that it is easy to get sick. Elderly people with high-grade hypertension are worried about complications. One of the factors that influences compliance with taking medication is age. Almost all respondents in this study were female. Women have a greater risk of hypertension after menopause, women are more obedient to undergoing treatment compared to male respondents because women care and pay more attention to their health, the different behavioral descriptions of men and women influence this. This makes women more concerned about their health so they have time for a health check at Posbindu.

Effect of Perceived Severity on Adherence to Taking Medication

Based on the results, the elderly have a moderate perception of severity 54%. Perceived severity shows a p-value of 0.036 < α 0.05. This significantly influences perceived severity and medication adherence in elderly hypertension.

The results of this study align with research conducted by (Tsadik et al., 2020) which was conducted in an Ethiopian hospital and obtained a p-value of 0.010 <α 0.05, meaning that perceived severity significantly affects medication adherence. The results of another study conducted at the Bandarharjo Community Health Center showed a p-value of 0.010 < α 0.05, indicating that the perceived severity of hypertension complications was high and caused death, becoming a burden on the family. However, respondents thought that hypertension would not disturb daily activities (Prabawati et al., 2022).

Elderly people who perceive moderate severity with moderate adherence to medication are due to the belief that the higher the blood pressure, the more susceptible they are to complications. Elderly people have suffered from hypertension for two to five years, someone who has suffered from hypertension for one to five years tends to be more compliant in the treatment process because of great curiosity and a high desire to recover, while someone who has suffered from it for more

than five years tends to be more compliant. The low one.

Effect of Perceived Benefit on Adherence to Taking Medication

Most of them show that the elderly have a moderate perception of benefits, 59%. Perceived benefits show a p-value of 0.682 > α 0.05. This shows no significant effect between perceived benefits and medication adherence.

The results of research conducted by Prabawati (2022) at the Bandarharjo Community Health Center showed a p-value of 0.499 > α 0.05, indicating that some are still unsure about going to health services regularly to check their health. In another study conducted by Tsadik (2020) at 4 hospitals in Ethiopia, the results showed a p-value of 0.0547 > α 0.05, meaning that there was no influence of perceived benefits on adherence to taking medication. According to HBM theory, a person's perceived benefits occur when they believe in the efficacy of a recommended action to reduce the risk of disease. Beliefs about the benefits of adhering to recommended therapy are important. The more aware a person is of the perceived benefits, the more obedient they will be to undergoing treatment (Fitriani et al., 2019).

Elderly people have a moderate perception of benefits with moderate adherence to medication because most elderly people feel the benefits of the medicine they get. However, elderly people feel that if they continue to take medicine they feel uncomfortable because elderly people think that if the medicine is consumed continuously it will cause damage to the kidneys.

The Influence of Perceived Barriers on Medication Adherence

The majority showed that the elderly had a moderate perception of obstacles, 51%. Perceived obstacles show a p-value of 0.216 > α 0.05. This shows that there is no influence between perceptions of obstacles and adherence to taking medication.

The study's results are by research conducted by (Andraini et al., 2022) with a p-value of 0.183 > α 0.05, patients felt that the large amount of medication they were taking, the long treatment caused boredom and the existing side effects affected compliance with taking medication. Another study conducted by Prabawati (2022) showed that the perception of barriers was p value 0.057 > α 0.05, respondents had to take the time to go to health services.

The elderly have a perception of moderate obstacles to compliance with taking medication are moderate because the elderly do not find it difficult to remember the schedule for taking medication even though no one reminds them. However, the elderly feel they incur expensive costs when they have to go to health services regularly and continually buy medicine. Even though the medical staff said that the examination at the health center would not incur costs, in other words, it would be free. The elderly said that going to health services requires transportation. Income is one factor that plays a role in a person's health condition. Someone with a high income tends to be motivated to visit health facilities so that the opportunity to receive treatment is higher.

The Influence of Self-Efficacy on Medication Adherence

Self-efficacy shows that most elderly people have a moderate self-efficacy of 62%. Self-efficacy shows a p-value of 0.081 > α 0.05. This shows that there is no influence between self-efficacy and adherence to taking medication.

The results of this study are those conducted by Andraini (2022) with a p-value of 0.145 > α 0.05, respondents were not confident in carrying out treatment. Research conducted by Ariesti (2018) obtained a p-value of 0.155 > α 0.05, many respondents suffering from hypertension were still under 5 years old and there were no complications causing confidence to decrease, thus affecting compliance with taking medication. According to HBM theory, a person's ability to influence changes in health behavior. People are more likely to adopt health behaviors if they think they can.

Elderly people have moderate self-efficacy and medication adherence because most elderly people do not have comorbidities. This causes compliance to take medication to be reduced. The elderly said that when the medication runs out they will not go to health services when there are no symptoms. The elderly said they could take medication according to schedule but only when symptoms appeared and until the medication was finished. Elderly people prefer not to take medication continuously. The stronger a person's self-efficacy, the higher a person's commitment to achieving the goals he or she determines. Elderly people with good self-management have good knowledge, skills, and self-confidence in managing their health. Good self-efficacy means the elderly's self-management will be good too.

The Effect of Cues to Action on Medication Adherence

Cues to act show that most elderly people have moderate cues to act, 66%. Cues to act show a p-value of 0.746 > α 0.05, it can be concluded that there is no influence between cues to act and adherence to medication.

The research was conducted by Sri (2021) with a p-value of 0.119 > α 0.05, there is no influence between cues to act and compliance with medication. The results of another study conducted by Lintin (2018) showed that the p-value was 0.144 > α 0.05, a lack of family support makes a person non-compliant with treatment.

Elderly people with a signal to act are moderate with moderate adherence to medication because the elderly feel that the information they get from their peers helps overcome existing problems. Information support for the treatment of hypertension in the elderly is still lacking. This information support is an influential factor in increasing compliance with taking medication, such as providing advice or advice on medication, information on taking medication, recommending routine blood pressure checks at health services so that when knowledge increases and the will is there, the elderly will be more compliant with taking medication. Elderly who cannot access sources of information from the internet and there are no reminders to take medication apart from their family and themselves. The information obtained still relies on peers and medical personnel. The family can be an influential factor in determining a person's health beliefs and values and can determine the treatment program they receive. One of the reasons for incomplete treatment is the role of the family that does not fully accompany the elderly.

Factors that Most Influence Medication Compliance

Perceived susceptibility, 18.2%, impacts medication adherence most among the elderly with hypertension. Perceived severity second influences medication adherence in 7.2% of elderly hypertensive patients. Other factors such as perceived benefits, barriers, self-efficacy, and cues to action do not influence treatment adherence in elderly hypertensive patients because their effects are small.

The elderly who are already not young Again feel prone to disease. The older somebody, have a lot of problem health Which appear. The function body becomes

weak, so that more easy Sick. Women are at risk of more high blood pressure after menopause. Compared to men, Woman more obedient to treatment, Because Women care more about their health and pay more attention to it. Those who have suffered from high blood pressure for One to five years tend to be more sympathetic to treatment Because flavor want to know Their big desire for healing, whereas those Who have suffered for more than five years tend to be obedient which is bad for therapy.

5. Conclusions

Based on the results of research on the analysis of factors that influence adherence to taking medication in elderly people with hypertension based on the health belief model in the Jenggawah Primary Health Center working area, it can be concluded that there is an influence of perceived vulnerability, perception of severity on compliance with taking medication in elderly people with hypertension. There is no effect of perceived benefits, perceived obstacles, self-efficacy, or cues to act with medication adherence in hypertensive elderly.

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AUTHOR CONTRIBUTIONS

Substantial contributions to conception, data collection, analysis, and writing: Aulia Hilda Pristianti, Trisna Vitaliati, Nurul Maurida. Manuscript revisions: Trisna Vitaliati.

CONFLICT OF INTEREST

The authors declared no potential conflicts of interest concerning this article's research, authorship, and/or publication.

DATA AVAILABILITY STATEMENT

The data are not publicly available due to privacy or ethical restrictions.

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