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Original Research Paper

Relationship of Health Belief Model with Medication Adherence in RW 11, Bangetayu Kulon Village, Semarang

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ABSTRACT

Background: Hypertension cases in Indonesia are on the rise annually. Identifying risk factors is crucial for prevention. Risk factors include non-modifiable elements and modifiable ones. The Health Belief Model (HBM) is widely used to understand patient adherence to antihypertensive treatment adherence. **Objective:** This study aimed to pinpoint key patient adherence to antihypertensive treatment in RW 11, Bangetayu Kulon Village, Semarang. **Methods:** A cross-sectional quantitative design. Independent variables included perceived susceptibility, severity, benefits, barriers, self-efficacy, and cues to action, while the dependent variable was adherence to antihypertensive medication. The sample comprised 33 hypertensive patients selected through purposive sampling. Data collection involved a validated questionnaire administered via interviews. Statistical analysis was conducted using SPSS version 27, with chi-square for bivariate analyses, and logistic regression for multivariate analysis. **Results:** Bivariate analysis indicated that perceived susceptibility, benefits, severity, and self-efficacy significantly correlated with treatment adherence. Multivariate analysis revealed that perceived severity and self-efficacy were the strongest predictors of adherence, with self-efficacy being the most dominant factor (PR 33.67, 95% CI 2.937–385.989, p = 0.005). **Conclusion:** The Health Belief Model effectively predicts medication adherence among hypertensive patients. Interventions aimed at improving self-efficacy and emphasizing perceived severity of hypertension could enhance patient adherence to treatment.

Introduction

Hypertension is a chronic condition characterized by persistently elevated blood pressure within the arteries. This elevated pressure occurs when the small blood vessels, known as arterioles, constrict, making it harder for blood to flow smoothly. As a result, the heart must work harder to pump blood against this increased resistance, leading to strain on the heart and blood vessels. Over time, this increased workload can damage the heart and blood vessels, increasing the risk of serious health complications such as heart attack, stroke, kidney disease, and heart failure[1,2]. Hypertension often results in dangerous conditions that are often not realized and cause symptoms, while blood pressure that is continuously high for a long period of time can cause complications[3]. Hypertension is often referred to as the Silent Killer because it is a deadly disease without being accompanied by prior symptoms. Hypertension has risk factors that cannot be modified and those that can be modified. Unmodifiable risk factors include age, gender, history of hypertension and cardiovascular disease in the family. Modifiable risk factors include a history of diet (excessive salt consumption), excessive alcohol consumption, lack of physical activity, smoking habits, obesity, dyslipidemia, diabetes

mellitus, psychosocial and stress[4].

The Health Belief Model (HBM) is a widely used theory to predict and explain individual health behaviors in disease prevention and control efforts. This model was originally developed in the 1950s by social psychologists to understand why individuals participate in health programs such as health checks and immunizations. The HBM helps explain how a person's perception of the susceptibility, seriousness, benefits, and barriers of a health action can influence their motivation to take that action. Research using the HBM assesses several constructs, including perceived susceptibility, perceived severity, perceived benefits, perceived barriers, and cues to action[5].

The Health Belief Model is a valuable tool for understanding why individuals engage in or avoid health-promoting behaviors. HBM identifying the key beliefs and attitudes that influence health decisions, healthcare providers can develop more effective interventions to improve public health outcomes[6]. Previous research has shown that perceived barriers are the strongest predictors of patient adherence to treatment in the context of hypertension, the HBM has been used to understand factors that influence patient adherence to antihypertensive medication, especially among the elderly population who are at higher risk of cardiovascular complications, stroke, and kidney failure. Prevention and control of hypertension depends on individual awareness of the importance of lifestyle modifications, such as weight loss, low-sodium diet, and adherence to appropriate medication regimens[7].

Healthcare provider better diagnosed and treatment hypertension also confirmed patient adherence use antihypertensive drugs. We analyze adherence treatment for hypertension in RW 11, Bangetayu Kulon Village, Semarang used Health Belief Model application to report factor induced patient adherence. The authors aim to analyze this researche to help patient adherence treatment to hypertension.

Materials and Methods

Research Design

This research is designed as quantitative-based cross-sectional design. The study aims to investigate association between perceived susceptibility, perceived severity, perceived benefits, perceived barriers, self-efficacy, and cues to action to patient adherence treatment to antihypertensive drugs in RW 11, Bangetayu Kulon Village, Semarang used Health Belief Model.

Sample

The sample in this study were all hypertensive patients in Bangetayu Kulon Village, Neighbourhood Eleven that had been given medication from Bangetayu Kulon Healthcare. Participants of this study were hypertensive patients in Bangetayu Kulon Village, Neighbourhood Eleven selected via the purposive sampling method and based on certain criteria. A number of 33 participants were selected from each of six other small neighborhoods. The inclusion criteria were as follows: age range of above 15 years, receiving antihypertensive medication from the public health center, and willingness to take part in this research. On the other hand, the exclusion criteria entailed a history of chronic diseases that could be dangerous (heart disease, asthma, diabetes mellitus, tuberculosis, and stroke), illiteracy, and sickness during the study period.

Data Collection Techniques

Data were obtained through Health Belief Model scale was used to assess compliance with hypertensive treatment. The instrument to measure the health belief model used several questions that have been tested for validity and reliability, consisting of 8 items on perceived barriers,4 items on perceived severity, 7 items on perceived benefits, 6 items on self efficacy and 12 items on cues to action.[8] Primary data

was obtained through interviews by the researchers using a questionnaire on google form that presented directly to the respondents. The study began in September 2024 in RW 11, Bangetayu Kulon Village, Semarang.

Data Analysis Techniques

Statistic data analyzed using IBM SPSS Statistic 27 edition software. The univariate analysis results are presented in the form of frequency distribution tables of subject characteristics, hemoglobin examination results, and anemia incidence. We applied chi-square analysis and binary logistic regression to investigate the association between the independent and dependent variables. The level of significance is indicated as p-value < 0.05.

Ethical Clearance

This study received ethical approval from the ethics committee of Sultan Agung Islamic University, ensuring compliance with medical ethics principles. Informed consent was also obtained from the people in Bangetayu Kulon Village, Neighbourhood Eleven.

Results

Hypertension is a chronic condition requiring long-term adherence to treatment to prevent complications. However, compliance with antihypertensive treatment remains a significant challenge, influenced by various patient perceptions and behavioral factors. This study examines the demographic and clinical characteristics of patients and explores the relationship between perceived factors—such as susceptibility, severity, benefits, barriers, self-efficacy, and cues to action—and adherence to hypertension treatment. The analysis employs both chi-square and logistic regression tests to identify significant factors and their impact on treatment compliance levels among hypertensive patients in Bangetayu Kulon Village in 2024. The findings provide critical insights into the underlying factors affecting adherence, offering a basis for targeted interventions to improve patient outcomes.

The results of the characteristics of the subjects of the study in table 1 shows that of 17 the majority of subjects of the study were woman (51,5%), 17 subject were 15-49 years old (51.5%), 14 subject were senior high school (42,4%), 10 subject were not occupation (30,3%), and 21 body mass index were normal (63,6%).

Table 2 shows the results of the chi-square test of several factors that cause low compliance with hypertension treatment, obtained that the perception of susceptibility with sig (p-value 0.172), perception of prevalence with sig (p-value 0.09), perception of benefits with sig (p-value 0.012), perception of barriers with sig (p-value 0.435), perception of self-efficacy with sig (p-value 0.001), and motivation to act with sig (p-value 0.275).

Table 3 shows the results of the multivariate test using logistic regression, indicating that variables significantly related to the level of compliance with hypertension treatment are perception of severity and perception of self-efficacy. The model was considered feasible, as evidenced by the omnibus test value (p = 0.000). The Nagelkerke R Square value of 0.592 indicates that these two variables can explain 59.2% of the variance in hypertension treatment compliance. Among these, self-efficacy is the most dominant factor, with a risk ratio (RP) of 33.67 (95% CI: 2.937 - 385.989). This means that hypertension patients with a negative perception of self-efficacy are 33.67 times more likely to be non-compliant in taking their medication compared to those with a positive perception. These findings highlight the importance of strengthening self-efficacy to improve medication adherence in hypertension patients.

Table 1. Sample Characteristic

Variable	Category	Freq. (n=33)	Percentage (%)
Gender	Man	16	48,5
	Woman	17	51,5
Age	15-49 years old	17	51,5
	>49 years old	16	48,5
Education	Not Educated	2	6,1
	Elementary School	4	12,1
	Junior High School	4	12,1
	Senior High School	14	42,4
	D3	3	9,1
	D4/S1	4	12,1
	S2	2	6,1
Occupation	Not Occupation	10	30,3
	PNS	3	9,1
	Private employee	5	15,2
	Housewife	7	21,2
	Self-employed	7	21,2
	Other	1	3,0
Body Mass Index	Overweight/Obesity	12	36,4
	Normal	21	63,6
	Underweight	0	0

(Primary Data, 2024)

Table 2. Distribution of Perceived Factor of Patient with Hypertensive Treatment Adherence

Variable		Hypertension Treatment Compliance Level				*p-value*	PR	CI: 95%
		Not Obey		Obey				
		n	%	n	%			
Perceived Susceptibility	Negative	4	26,7	11	73,3	0,172	0,36	0,084 – 1,583
	Positive	9	50	9	50			
Perceived Severity	Negative	3	18,8	13	81,3	0,019	0,16	0,033 – 0,787
	Positive	10	58,8	7	41,2			
Perceived Benefit	Negative	9	64,3	5	35,7	0,012	6,75	1,428 – 31,896
	Positive	4	21,1	15	78,9			
Perceived Barrier	Negative	6	33,3	12	66,7	0,435	0,57	0,139 – 2,342
	Positive	7	46,7	8	53,3			
Self Efficacy	Negative	11	68,8	5	31,3	0,001	16,5	2,687 – 101,331
	Positive	2	11,8	15	88,2			
Cues to Action	Negative	9	47,4	10	52,6	0,275	2,25	0,518 – 9,768
	Positive	4	28,6	10	71,4			

(Primary Data, 2024)

Table 3. Modeling Factor Affecting Adherence with Antihypertensive Treatment for Hypertension Patient in Bangetayu Kulon Village in 2024

Variabel	Sig.	Exp (B)	CI: 95%	
			Lower	Upper
Step 1				
Perceived Susceptibility	0.403	3.331	0.198	55.924
Perceived Severity	0.032	0.029	0.001	0.739
Perceived Benefit	0.721	1.569	0.133	18.495
Self Efficacy	0.020	29.394	1.694	509.907
Step 2				
Perceived Susceptibility	0.380	3.473	0.216	55.856
Perceived Severity	0.029	0.028	0.001	0.694
Self Efficacy	0.004	38.705	3.226	464.440
Step 3				
Perceived Severity	0.028	0.068	0.006	0.742
Self Efficacy	0.005	33.671	2.937	385.989

(Primary Data, 2024)

Discussion

This study explored factors affecting treatment adherence among hypertensive patients at neighborhood eleven Bangetayu Kulon. This study was guided by Health Belief Model. The bivariate analysis demonstrated that medication adherence in hypertensive patients was significantly correlated with perceived susceptibility, perceived benefits, perceived severity, and self efficacy. The multivariate analysis revealed that the significant predictors of using HBM constructs were self efficacy of being at risk of getting hypertension treatment noncompliance and perceived severity of being at protective of getting hypertension treatment noncompliance.

Other study at Cimahi City Health Center showed a different result that perceived seriousness, perceived susceptibility, and perceived barriers have significant in the relationship model in medication adherence of hypertensive patients.[9] This result in our research is similar to a recent study about application of the health belief model to antiretroviral medication among elderly people that self-efficacy was being the crucial psychological predictor of adherence to treatment.[10] Self-efficacy refers to individual believe in their ability to perform specific behaviors significantly and influence their motivation and actions. In the case of chronic disease like hypertensive management, self-efficacy is vital. Patients must feel confident in their ability to manage their health, treatment adherence, and make necessary lifestyle changes.[11] There is a positive correlation between age and diastolic blood pressure among the elderly.[12]

Limitation of our study that our sample was underrepresented, caution should be taken when generalizing the findings. Another limitation was self-reported adherence may be affected to be bias also this study needs more prospective evidence.

These findings underscore the importance of tailored interventions that focus on enhancing self-efficacy and addressing patients' perceptions of their condition's severity. Educational programs and counseling sessions can be effective strategies to help patients better understand the potential risks of nonadherence and empower them to take control of their treatment plans. Healthcare providers should emphasize consistent communication, providing encouragement and practical tools to build confidence in managing hypertension. Additionally, integrating family support and community involvement may

further enhance patients' motivation and ability to adhere to treatment regimens.

Future research should consider a broader and more diverse sample to increase the generalizability of the findings. Incorporating objective measures of adherence, such as pharmacy refill records or electronic monitoring, could address biases inherent in self-reported data. Moreover, longitudinal studies examining the long-term effects of self-efficacy and perceived severity on treatment compliance would provide valuable insights. These efforts could contribute to the development of comprehensive strategies to improve adherence, ultimately reducing the burden of hypertension and its associated complications in diverse populations.

Conclusion

This study highlights the critical role of psychological factors, particularly self-efficacy and perceived severity, in influencing treatment adherence among hypertensive patients. Guided by the Health Belief Model, the findings demonstrate that self-efficacy is the most significant predictor of compliance, emphasizing the importance of building patients' confidence in managing their condition and adhering to prescribed treatments. Perceived severity also plays a protective role in encouraging compliance by underscoring the potential risks of nonadherence.

While the results align with prior research emphasizing the importance of self-efficacy in chronic disease management, variations in findings across studies suggest the influence of contextual and demographic factors. Limitations, including a relatively small and underrepresented sample and reliance on self-reported data, suggest the need for future studies with larger and more diverse populations, as well as more robust methods for assessing adherence. These findings underscore the need for targeted interventions that strengthen self-efficacy and address patients' perceptions of severity to enhance hypertension management outcomes.

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