



The Mediating Effect of Self-Management Between Behavior-Specific Cognitions and Commitment in Outpatients with Hypertension in Malang, Indonesia

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Abstract. Objective: This study examined to explore the correlation between behavior-specific cognitions and commitment while considering the mediating role of self-management. Methods: Data from 202 hypertensive outpatients at public health centres (PHCs) was collected using a cross-sectional study with multistage cluster sampling. Multiple tools, including the benefits to health-promoting behaviour scales (BES), brief medication questionnaire (BMQ), the medication adherence self efficacy (MASES), and patient activation measure-13 (PAM-13), were used to determine perceived benefits, barriers, self-efficacy, and self-management. Descriptive statistics, Pearson correlation, and Sobel-test were used for analysis. Results: Behavior-specific cognitions and self-management showed positive effects on commitment, especially when self-management was utilized as a variable that acts as a mediator. Conclusions: This study's outcomes clarify the determinants affecting commitment among hypertensive outpatients and provide information for primary healthcare centres to improve health promotion programs.

Keywords: behavior, cognition, commitment, hypertension, outpatient, self-management

1. Introduction

Hypertension is among the most prevalent chronic illnesses globally. High blood pressure affects more than a quarter of adults worldwide.(1) The World Health Organization (WHO) reports that over 1.13 billion individuals globally suffer with hypertension, with projections indicating that this figure will rise to 1.56 billion by 2025.(2) Along with a global trend, the number of Indonesians with hypertension has been increasing. According to recent studies, The incidence of hypertension in Indonesia is exceedingly high, reaching 34.11%.(3) Malang City's prevalence rate of hypertension is 35.92%, which is higher than the national average in Indonesia.(4) Over one-third of Malang's population is afflicted by this illness, which can lead to serious health complications if left untreated. Therefore, individuals need to take the necessary steps to manage and control their blood pressure levels to maintain good health. However, an interesting phenomenon was observed in Malang City. Patients diagnosed with hypertension have limited ability to act and make decisions independently. The decisions about the treatment process are mostly influenced by the preferences of family members or individuals with higher social status. This phenomenon is shaped by a complex interplay of cultural factors. Hypertension requires long-term treatment to prevent dangerous complications and maintain a good quality of life.(5) Adhering to the prescribed treatment regimen is crucial to minimize the dangers of complications. Non-adherence to medication is the most common problem among patients.(6) The prevalence of medication non-adherence in Indonesia is a noteworthy concern, with a recorded rate of 45.6%. This high rate of non-medication adherence can lead to negative health outcomes, suboptimal therapeutic outcomes, and increased healthcare costs.(3) Identifying the factors that contribute to pharmaceutical non-adherence and formulating ways to mitigate them is essential for enhancing medication adherence. Commitment is considered a significant element determining adherence behavior in hypertension patients.

The management of chronic disease, such as hypertension, which necessitates life-long treatment, can be a challenging undertaking. A pivotal aspect of managing such conditions is commitment. Specifically, commitment refers to the adherence to a treatment plan over a prolonged period without any deviation. Commitment ensure that an individual's behavior is predictable, an essential element in the management of chronic conditions like hypertension. Maintaining controlled blood pressure and promoting general health and well-being, commitment is essential for improving the quality of life for those with chronic conditions. According to Nola J. Pender's Health Promotion Model (HPM), commitment is the main factor that determines health promotion behavior.(7) Health-promoting activities are acknowledged as fundamental for maintaining health in individuals with chronic conditions, such as hypertension.(8) Commitment can be defined as a condition where a person has a consistent sense of self or identity.(9) A stable self-meaning will ensure consistent behavior over a long period of time. Commitment shows that a person is ready to make changes (readiness-to-change).(10) Commitment is a complex psychological phenomenon arising from an individual's internal cognitive process. When considering whether to perform a particular behavior, individuals typically thoroughly evaluate the associated benefits and drawbacks of that action, as well as their level of self-efficacy. This evaluation process involves careful consideration of the potential outcomes of the behavior, including the positive consequences that may result from it and any negative consequences that may be associated with it. In addition, individuals will often assess their ability to successfully perform the behavior, taking into account their skills, knowledge, and resources. This evaluation process is crucial in determining whether or not an individual will ultimately commit to performing the behavior and can significantly impact their future actions and decisions.(7)

Although previous studies have shown that behavior-specific cognitions positively impact a person's commitment, there has been a scarcity of research validating the mediating effect of self-management behavior on behavior-specific cognitions and commitment in antihypertensive medication. Self-management is a crucial ability that involves taking control of one's life and making decisions based on personal evaluation of their own needs.(11) It requires an individual to be proactive and take action based on their assessment of what they require to achieve their goals. The process involves being self-aware and using that knowledge to identify and set achievable objectives. Self-management also involves monitoring one's progress toward goals and making necessary adjustments to stay on track. It is an essential skill for personal growth and development, and it allows individuals to take charge of their lives, make informed decisions, and achieve their desired outcomes.(12) The active involvement of hypertensive patients in the management process can improve adherence to therapy.(13) Therefore, this study sought to examine the correlation between behavior-specific cognitions and commitment, taking into account the mediating role of self-management. Figure 1 shows the hypothesis that self-management behavior will significantly mediate the relationship between behavior-specific cognitions and commitment.

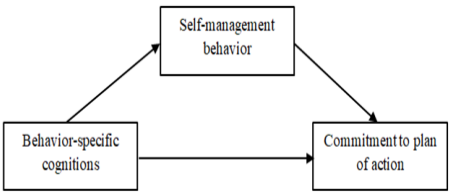


Figure 1. The relationship between behavior-specific cognitions commitment to a plan of action through its influence on self-management behavior

2. Method

Design and Samples

This research employed a cross-sectional design utilizing multistage cluster sampling as the data gathering method. The sample was chosen via multiple stages. Initially, we determined which location among the five sub-districts in Malang City, East Java, Indonesia, would be included using random lotteries. Two sub-districts were chosen randomly: Blimbing and Lowokwaru. In the next step, researchers used random lotteries to choose four villages. The villages of Dinoyo, Mojolangu, Pandanwangi, and Polowijen were selected at random. Subsequently, researchers employed successive sampling, utilizing inclusion and exclusion criteria for participant selection in each community. The inclusion criteria were people diagnosed with hypertension for at least six months, old adults (age ≥ 45 years), registered as patients in public health centres (PHCs) in that village, and able to respond to the questionnaires. Participants exhibiting cognitive impairment and emergency conditions were excluded. Informed consent was secured from patients who agreed to participate in this investigation.

Measurements

1) Demographic characteristics

Demographic characteristics, such as gender, age, level of education, the presence of existing comorbidity, duration of hypertension diagnosis, and married status, were additionally enumerated in the questionnaire. Comorbidity was observed when participants disclosed additional preexisting conditions alongside hypertension, including diabetes mellitus, stroke, heart failure and others.

2) Behavior-specific cognitions

The behavior-specific cognitions include 3 important dimensions: perceived benefits of action, perceived barriers to action, and perceived self-efficacy. A scoring method used was the Likert 4-point scale. Ratings ranging from 1 to 4 indicated that they strongly disagreed to agree strongly.

The instrument used to measure perceived benefits of action was The Benefits to Health-Promoting Behavior Scales (BES).(14) The Indonesian version of BES has proven to be valid and reliable, with a Cronbach alpha value of 0.832.(15) Five favourable statement items assess participants' perceptions of the benefits of taking medication as a blood pressure control and preventing complications.

The instrument used to measure perceived barriers to action was the Brief Medication Questionnaire (BMQ). (16) This questionnaire consisted of 8 statement items that identified participants' opinions on the side effects of therapy, complicated medication

schedules, large amounts of medication, difficulty refilling medication, and medication packaging.

The instrument used to measure self-efficacy was the Medication Adherence Self Efficacy (MASES).(17) The Indonesian version of MASES has proven to be valid and reliable, with a Cronbach alpha value of 0.744.(15) This questionnaire consisted of 12 statement items that identified participants opinions on the ability to adhere to taking medication under various conditions.

3) Self-management

The Patient Activation Measure-13 (PAM-13) was employed to assess self-management behavior. The questionnaire included 13 dimensions: proactive lifestyle, proactive problem-solving management, proactive collaboration, proactive mental support, proactive planning, and reactive management. A Likert-4-point scale was used, with scores varying from 1 to 4 to indicate the level of agreement. Higher scores indicated better self-management behaviour. The questionnaire was reliable and valid, with a total Cronbach's α value of 0.842.(18)

4) Commitment

The commitment refers to an agreement or attachment to do something that can come from external or internal sources.(9) This study used an instrument developed by a researcher based on Rogers and Milkman.(19) The instrument used to measure patient commitment consists of seven subcategories, including consistency and responsibility. A Likert 4-point scale ranging from 1 to 4 was used to assess patient responses, with scores indicating the degree of agreement from significant disagreement to strong agreement. An elevated score on the scale indicates a better level of commitment from the patient.

Data Collection Procedure

The data collection for this research project was conducted from January to February 2024. To ensure the accuracy and reliability of the collected data, all researchers involved in the study underwent a comprehensive one-day structural training program concerning the research project and the data acquisition procedure. Before commencing the research, the researchers secured coordination and authorization from the heads of the public health centers (PHCs) to conduct their research. The researchers then collected data regarding prospective patients with hypertension from the public healthcare facility. This information included a list of hypertensive patients, their addresses, and contact numbers. After obtaining this information, the researchers approached the participants by conducting home visits. During these visits, participants were given a brief but comprehensive explanation about the objectives of the research, the procedure, and the means of participation available to them. Participants who consented to participate in the study were provided with an informed consent form, which they must read and sign before continuing. The researchers asked the participants to complete a detailed questionnaire that required demographic data and information about existing comorbidities, behavior-specific cognitions, commitment, and self-management behavior to obtain the necessary data. Upon finishing the questionnaire, the researchers carefully rechecked the form to ensure that all the necessary information had been captured accurately.

Data Analysis

The collected data were initially examined utilizing SPSS 24.0 (IBM Corporation, Armonk, New York, United States). Descriptive statistics were used for gender, age, level of education, existing comorbidity, duration of hypertension diagnosis, married status, behavior-specific cognitions, commitment, and self-management behavior. An internal consistency assessment (Cronbach’s α) was used to verify the reliability of the instruments. Pearson’s correlation coefficients were employed to assess the correlations among the subcategories of the variables. To examine the function of commitment as a mediator of behavior-specific cognitions on self-management behavior, the regression methodology proposed by Baron and Kenny was followed.(20) To test the mediating effect, we ran three regression models. First, we checked the relationship between behavior-specific cognitions and self-management behavior. Next, we checked the relationship between commitment and behavior-specific cognitions. Finally, we checked the relationship between commitment, behavior-specific cognitions, and self-management behavior. We included control variables in all models. According to Baron and Kenny, if the first two models show that behavior-specific cognitions have a statistical significance, and if the third model shows that the mediator (self-management behavior) is statistically significant while the independent variable (behavior-specific cognitions) is not, a mediating influence is present. Preacher and Leonardelli (21) proposed an alternative method to test the mediating effect: the Sobel test. This test is more efficient and can yield a more conclusive outcome when the results are inconsistent with those derived using the Baron and Kenny method.(22) Consequently, for this study, the Sobel test was performed following the regression analyses. A p -value of the Sobel test is below 0.05 indicates a statistically significant mediating influence.

Ethical Issue

The research obtained ethical authorization (No.03.11.9/UN32.20.2.9/LT/2023) from Universitas Negeri Malang. All study procedures adhere to the ethical principles outlined in the Declaration of Helsinki. Participants were provided with research explanations and complimentary access to participate. Upon agreement, respondents signed informed consent to initiate participation. Access to the data was restricted solely to the research team.

3. Result

General Characteristics

A total of 240 hypertensive patients were selected: 38 hypertensive patients were excluded from this study (15 were unwell and receiving treatment at the hospital, 9 people have decreased cognitive function, 8 people did not receive antihypertensive therapy, 6 people had been diagnosed with hypertension for less than 6 months). Finally, 202 eligible hypertensive patients were approached for participation in this research, and all agreed to participate. Table 1 displays the general characteristics of the participants. The majority, 67.8%, were female. 38.6% were over 65 years old, and 58.4% had a low level of education. 69.8% of the participants were living without any comorbidity. 82.2% had been living with high blood pressure for over 10 years, and 89.6% were married.

Table 1. The characteristics of participants (N = 202)

Characteristics	<i>n</i>	%
<i>Gender</i>		
Male	65	32.2
Female	137	67.8
<i>Age (years)</i>		
46-55	53	26.2
56-65	71	35.1
>65	78	38.6
<i>Level of education</i>		
Low	118	58.4
Intermediate	50	24.8
High	34	16.8
<i>The presence of existing comorbidity</i>		
None		
Comorbid	141	69.8
	61	30.2
<i>Living with high blood pressure (years)</i>		
≤10		
>10	166	17.8
	36	82.2
<i>Married status</i>		
Married	181	89.6
Single	21	10.4

The assessment of multicollinearity among the variables was conducted initially. Table 2 presents the Pearson correlation data, indicating the absence of multicollinearity issues. All correlation coefficients are less than 0.997 (Table 2). The results presented in Table 2 indicate that behavior-specific cognitions is positively correlated with self-management behaviors, and positively correlated with commitment. Self-management is positively correlated with commitment.

Table 2. Descriptive statistics, Cronbach's α , and correlations for major study variables

Variables	<i>a</i>	<i>b</i>	<i>c</i>
<i>a</i>	1		
<i>b</i>	0.461	1	
<i>c</i>	0.436	0.908	1
<i>Cronbach's α</i>	0.2307	1.000	1.000
<i>Mean</i>	20.29	15.12	17.12
<i>Standard deviation</i>	2.53	5.52	6.07
<i>Skewness</i>	0.623	0.189	0.120
<i>Kurtosis</i>	1.974	-0.989	-0.907

a = Behavior-specific cognitions

b = Self-management behaviors

c = Commitment

Mediating Effect of Self-Management between Behavior-specific Cognition and Commitment

According to the results, the direct impact of behavior-specific cognitions on self-management was found to be significant (p-value: 0.000; coefficient: 0.935), which indicates that behavior-specific beliefs have a significant influence on an individual's ability to self-management. Additionally, the direct effect of self-management on commitment was also substantial (p-value: 0.005; coefficient: 0.173), suggesting that self-management plays an essential role in fostering commitment. Moreover, the direct impact of behavior-specific cognitions on commitment was found to be significant (p-value: 0.000; coefficient: 0.788), indicating that behavior-specific beliefs have a significant influence on an individual's level of commitment. Furthermore, the study discovered that self-management mediates the relationship between behavior-specific cognitions and commitment, with an indirect effect (p-value: 0.000; coefficient: 0.950). Commitment among hypertensive outpatients was strengthened through self-management.

Table 3. Mediating effect of self-management in the relationship between behavior-specific cognitions and commitment

Endo-genous variables	Exo-genous iables	var-	Effects		Total (P)
			Direct (P)	Indirect (P)	
b	a		0.935 (0.000)	-	0.935 (0.000)
c	b		0.173 (0.005)	-	0.173 (0.005)
	c		0.788 (0.000)	0.162 (0.000)	0.950 (0.000)

a = Behavior-specific cognitions
b = Self-management behaviors
c = Commitment

Table 3 provides an overview of the mediating effect of self-management in the relationship between behavior-specific cognitions and commitment.

To proceed with the analysis, the subsequent step is to do Sobel's product of coefficients test. This method is widely used to test for mediation effects. Sobel's test is based on the computation of standard errors. To calculate Sobel's z-value and the significance level of each mediating effect, the formula established by Preacher and Hayes is used. By applying this test, we can determine the extent to which the mediator variable accounts for the relationship between the independent variable and the dependent variable.(23) According to the findings, it was observed that self-management played a vital role in establishing a relationship between behavior-specific cognitions and commitment. The statistical analysis revealed that this relationship was statistically significant (z = 11.844; p = 0.000), indicating that self-management acted as a mediator in this relationship. Table 4 presented the Sobel test for the mediating effect.

Table 4. Sobel test of mediating effect

	Test statistic	Standard error	<i>P</i> -value
Sobel test	11.844	0.116	0.000
Aroian test	11.835	0.116	0.000
Goodman test	11.852	0.116	0.000

4. Discussion

The findings of the current investigation suggest that behavior-specific cognitions have a direct impact on commitment and an indirect effect through self-management in individuals with chronic illnesses. This finding highlights the crucial role of self-management skills in patients with chronic diseases. Self-management is a perpetual responsibility that necessitates patients to actively engage in overseeing their condition, which includes tracking symptoms, complying with medication regimens, and implementing essential lifestyle modifications. Patients with chronic conditions need to develop effective self-management strategies to promote better health outcomes and enhance their quality of life. With the right tools and support, patients can successfully manage their condition and lead fulfilling lives.(24) The management of chronic diseases is an ongoing and dynamic process where patients integrate multifaceted strategies to manage their conditions based on their individual needs and lifestyles. The method calls for a holistic approach that encompasses various dimensions of the patient's life and is tailored to their unique requirements. The self-management strategies employed by patients are designed to allow them to manage chronic illness within the framework of their daily activities. By incorporating these strategies, patients can effectively manage their conditions and improve their overall health outcomes.(25) Self-management behaviors are defined as proactive actions related to lifestyle, a problem, planning, collaborating, and mental support, as well as reactive actions related to circumstantial change, to achieve a goal. (11) The present study supports the Identity Theory, which posits that an individual's commitment serves as a means for them to invest their roles and social structure in self-motivated behaviors. This, in turn, results in a connection between the self and social structure. These findings have implications for understanding the mechanisms by which individuals link their own identities with larger social structures and may be relevant for chronic disease.(9)

The present study identified a novel contribution to the Health Promotion Model, demonstrating that self-management is a pivotal mediator in the relationship between behavior-specific cognitions and commitment. A self-management support program can be an effective means of preventing chronic diseases such as hypertension in primary care. This program typically involves helping patients develop the skills and knowledge needed to manage their health effectively.(26) This study found that strengthening self-management skills can significantly enhance the connection between behavior-specific cognitions and commitment. Behavior-specific cognitions, which encompass perceived benefits, perceived barriers, and self-efficacy, were identified as crucial factors that significantly influence one's actions. The study revealed that individuals with high levels of self-management skills are better equipped to navigate the complexities of behavior-specific cognitions and are more likely to remain committed

to achieving their goals.(27) Behavior-specific cognitions refer to an individual's beliefs, perceptions, and attitudes toward specific behaviors. These cognitions play a crucial role in determining their behavior, including self-management behaviors. As such, they are considered an essential core variable for intervention, as modifying them can lead to positive changes in behavior. Inaccurate information can be detrimental to individuals with chronic diseases as it can reduce their commitment to therapy. Therefore, it is essential to ensure that the information provided to individuals is accurate and reliable to avoid hindering their progress. Research conducted by Holcomb has shown that behavior-specific cognitions are positively associated with self-management behaviors. Moreover, education and intervention programs that focus on improving cognitive abilities have been found to have a positive impact on lifestyle management abilities, particularly among individuals with hypertension. These results emphasize the importance of such interventions in promoting positive behavioral changes and improving the quality of life for persons afflicted with chronic illnesses.(28)

Chronic diseases are conditions that require patients to have a proactive ability to control themselves. This ability is known as self-management, which can strengthen the influence of behavior-specific cognitions on commitment. Behavior-specific cognitions ultimately influence the commitment of hypertensive patients by promoting behaviors that induce the ability to make decisions. In a study conducted by Savioni, it was found that biased information can reduce the commitment of chronic disease sufferers. Cognitive biases play a significant role in daily life as they impact decisions and behaviors. In the case of chronic diseases, cognitive biases not only impact treatment decisions but also influence the willingness to pursue interventions that may mitigate their adverse effects.(29) However, having sufficient knowledge about the condition does not guarantee that a chronic disease sufferer is committed to carrying out therapy for a long period. The ability to self-control is a crucial factor in managing chronic diseases that require lifelong treatment. Therefore, developing self-management abilities is crucial to ensure that patients are committed to carrying out therapy consistently and effectively to manage their conditions.

This study has some limitations. First, generalising these findings to other types should be done with caution because this study involved outpatients only. Second, the self-management behaviors measure included in this study was originally designed for general diseases but adapted for hypertensive patients; thus, it may not sufficiently capture the distinctive characteristics of hypertension.

5. Conclusion

This study confirmed that commitment among hypertensive outpatients was strengthened through self-management. Therefore, strengthening self-management skills should be a focus of health promotion programs for patients with hypertension in primary care settings. Future research must focus on strategies for health promotion programs to improve self-management skills for people with chronic diseases.

6. Conflict of Interest

The author(s) declared no conflict of interest.

7. Acknowledgment

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