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**THE RELATIONSHIP BETWEEN KNOWLEDGE AND MOTIVATION IN
HYPERTENSION SELF-MANAGEMENT WITH BLOOD PRESSURE IN
HYPERTENSIVE PATIENTS**

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Abstract

Introduction: The trend of increasing hypertension tends to increase and shift to a younger age. Self-management of hypertension is a strategy to help individuals with hypertension change their negative behaviour. The application of hypertension self-management is influenced by predisposing factors such as the level of knowledge and motivation.

Objective: This study aimed to analyse the relationship between knowledge and motivation in hypertension self-management with the blood pressure of hypertensive patients.

Methods: This study used a correlational study with a cross-sectional approach. Respondents in this study were 146 hypertensive patients who were recruited using the purposive sampling technique. The independent variables in this study were the level of knowledge and motivation in hypertension self-management. The dependent variable in this study was blood pressure. The instruments used were questionnaires and blood pressure observation sheets. Analysis used Kendall's tau-b statistical test with a significance value of $p < 0.05$.

Results: The results of this study are the relationship between the level of knowledge ($p=0.000$, $r=-0.591$) and motivation in hypertension self-management ($p=0.000$, $r=-0.601$) with blood pressure.

Conclusions: Patients with hypertension correlate with their blood pressure and their level of motivation and knowledge about self-management of their condition. The level of knowledge and motivation is an important value that can help them achieve a more normal blood pressure value.

INTRODUCTION

Hypertension is one of the non-communicable diseases that is still a health problem in the world; this disease is often considered a silent killer because its symptoms are often not known at the beginning as a form of warning of danger. The increasing trend of hypertension tends to increase and shift to young age or productive age, which is influenced by various factors such as gender, body mass index (BMI), salt and junk food consumption, exercise, alcohol, income, sleep duration, and other chronic diseases on the incidence of hypertension (Firmansyah et al., 2020).

The impact of the Coronavirus Disease 2019 (COVID-19) pandemic has had an impact on activity restrictions in all fields. In the health sector, telemedicine is used as a strategy to prevent the spread of COVID-19 because the health service system uses electronic communication tools so that patients and health workers do not meet face to face directly. The use of telemedicine in health services is less than optimal due to the lack of public understanding of the use of technology, so some individuals with hypertension have limited knowledge (Lubis, 2021). Activity restrictions during the COVID-19 pandemic or even after the pandemic also have an impact on the motivation of hypertensive individuals to carry out hypertension self-management; low motivation in hypertension self-management increases a sedentary lifestyle, which causes individuals with hypertension to be less physically active and at risk of obesity (Lim & Pranata, 2020).

According to the WHO in 2019, the prevalence of hypertension covered 26% of the world's population, which is around 972 million people. The increase in the prevalence of hypertension occurs mostly in developing countries with low and middle income levels (Zhou et al., 2021). The prevalence of hypertension in Indonesia, based on data from the Ministry of Health of the Republic of Indonesia, based on measurements in the population aged 18 years, was 34.1%, which was an increase compared to the results of the 2013 Riskesdas of 25.8% (Kementerian Kesehatan RI, 2018). Generally, the prevalence of hypertension has increased significantly in patients aged 60 years and over, but recently the incidence of hypertension has shifted to a relatively younger age (Tirtasari & Kodim, 2019). The Benowo Health Center area is first in Surabaya with hypertension patients aged >15 years who received the most health services, namely 18,685 people (Dinas Kesehatan Kota Surabaya, 2020).

A preliminary study conducted on 11 hypertensive patients at the Benowo Surabaya Community Health Center found that 55% of hypertensive patients stated that hypertension medication was only consumed if blood pressure increased, not routinely; 73% of hypertensive patients did not know if they should limit their consumption of foods with high fat content and still consumed foods cooked by frying. As many as 91% only measured their blood pressure when visiting health services, not routinely at home. This illustrates that knowledge and motivation in the self-management of hypertension in hypertensive patients are still lacking.

Wake, Bekele, and Tuji found a correlation between the knowledge and attitude of adult hypertension patients on follow-up at specific public hospitals with self-monitoring of their blood pressure and their level of self-monitoring knowledge (Wake et al., 2020). The percentage of hypertension patients on follow-up who knew how to check their blood pressure and did so was low. A study on motivation with self-care of hypertension patients, one of which was conducted by Su'ud, Murtaqib, and Kushariyadi, produced data that motivation is related to self-care of hypertension patients (Su'ud et al., 2020a). This study measures motivation with the self-care ability of hypertensive patients undergoing hypertension treatment in a private clinic. Based on the studies above, the researcher wants to explore the relationship between knowledge and motivation with blood pressure in hypertensive patients in the context of health services in public health centers (Puskesmas).

Self-management, or a self-management program, is a cognitive behavioural strategy to help clients change their negative behaviour and develop positive behaviour by observing themselves and recording certain behaviours (thoughts, feelings, and actions). Self-management of hypertension can be done by monitoring blood pressure and making lifestyle changes such as stopping smoking, maintaining a healthy diet, and engaging in healthy physical activity (Lestari & Isnaini, 2018).

METHODS

Study Design

This study was a descriptive-correlational study with a cross-sectional approach. This study emphasizes the relationship between the level of knowledge and motivation in hypertension self-management with blood pressure in hypertensive patients. The independent variables in this research were the level of knowledge and motivation in hypertension self-management, and the dependent variable was the blood pressure in hypertensive patients.

Settings

The study was conducted in 2022 at the public health centre of Benowo, Surabaya, East Java, Indonesia.

Research subject

The size of the respondents in this study was 146 hypertensive patients with an age range of 18-55 years. The sampling technique in the study was a purposive sampling technique. All the study participants completed the questionnaires.

Instruments

The researcher adopted the questionnaire on the level of knowledge in hypertension from previous research in Indonesia (within five years) and re-examined the validity and reliability. Also, the same as the motivation questionnaire in hypertension self-management, we used the Hypertension Self-Care Profile (HBP-SCP) motivation scale questionnaire.

Intervention and Data Collection

The data collection procedure in this study was divided into two stages, namely the preparation and implementation stages. The preparation stage was licensing and two tests: ethical testing and validity and reliability tests of the questionnaire. The first step was that the researcher tested the validity and reliability of the questionnaire. The validity and reliability test of the questionnaire was conducted in hypertensive patients at another public health centre. Both questionnaires have been declared valid and reliable.

The next stage was the implementation stage. This stage was a step in collecting research data from respondents. This stage began after obtaining permission from various parties, namely the National and Political Unity Agency (Bakesbangpol) and the Surabaya City Health Service. Then we coordinated with Benowo public health center staff regarding sampling data on hypertension sufferers for the research objectives. Questionnaires were distributed to respondents who were present at the

Benowo public health centre, and they filled out the informed consent sheet after the researcher explained the purpose and benefits of the research and explained that prospective respondents were given the right of freedom to participate in or reject the research. Furthermore, after the respondents successfully filled out the questionnaire, the researcher observed the respondents' blood pressure 3 times with a 2-minute interval. After completion, the researcher documented the results of the respondents' blood pressure observations and the questionnaires that had been given.

Data Analysis

The data analysis used includes descriptive analysis and inferential analysis. Descriptive analysis of frequency distribution is used to determine the frequency distribution of hypertensive patient demographic data, level of knowledge, motivation in hypertension self-management, and blood pressure in hypertensive patients. Inferential analysis in this study used a Kendall's tau-b test with a significance value of $p < 0.05$.

Ethical Consideration

This research was approved by the Research Ethics Commission (KEPK) of the Faculty of Dentistry, Universitas Airlangga, on July 20, 2022, with certificate number 436/HRECC.FODM/VII-2022 with ethical considerations based on the study's purposes, voluntariness, and anonymity.

RESULTS

A total of 146 hypertensive patients as participants completed the questionnaires. The weighted sample was 46-55 years old in the age range, 57.5% female, 46.6% had latest an education level in senior high school, 47.9% had no job, and 65.8% had an individual income per month less than the minimum wage standard in Surabaya (2022) (see Table 1).

Table 1. Characteristic of Respondents based on Age, Gender, Latest Education Level, Employment Status, and Monthly Income of Family at the Public Health Centre of Benowo, Surabaya, East Java Province, Indonesia in 2022 (n = 146).

Characteristic of Respondents	Frequency	Percentage
	(f)	(%)
Age (Years)		
18-25	13	8.9
26-35	14	9.6
26-45	26	17.8
46-55	93	63.7
Total	146	100.0
Gender		
Male	62	42.5

Female	84	57.5
Total	146	100.0
Latest Education Level		
No School	7	4.8
Elementary School	29	19.9
Junior High School	25	17.1
Senior High School	68	46.6
College/ University	17	11.6
Total	146	100.0
Employment Status		
No Job	70	47.9
Private Sector	40	27.4
Tradesman	9	6.2
Self-Employed	14	9.6
Another	13	8.9
Total	146	100.0
Monthly Income of Family		
< Minimum Wage Standard	96	65.8
At the Range of the Minimum Wage Standard	47	32.2
> Minimum Wage Standard	3	2.0
Total	146	100.0

Primary Sources: Survey Data, 2022.

Based on the health history data of 146 respondents, it shows that as many as 64.4% of respondents have a long history of suffering from hypertension <5 years, as many as 63.7% of respondents have no history of other diseases besides hypertension, as many as 77.4% of respondents have no history of smoking or do not smoke, and as many as 97.9% of respondents do not have a history of alcohol consumption (see Table 2).

Table 2. The History of Respondents' Health at the Public Health Centre of Benowo, Surabaya, East Java Province, Indonesia in 2022 (n = 146).

The History of Respondents' Health	Frequency	Percentage
	(f)	(%)
Length of Suffering the Hypertension		
< 5 years	94	64.4
> 5 years	52	35.6

Total	146	100.0
Other Diseases Besides Hypertension		
Not	93	63.7
Yes (Diabetes Mellitus, Dyslipidaemia, Gastritis, Coronary Heart Disease, and Arthritis)	53	36.3
Total	146	100.0
Primary Sources: Survey Data, 2022.		

The association between the level of knowledge in self-management of hypertension with blood pressure showed that the majority of respondents had a moderate level of knowledge in self-management of hypertension and had blood pressure at the pre-hypertension level. The results of the statistical analysis of correlation using Kendall's tau-b correlation test, with a significance level < 0.05 , obtained a value of $p = 0.000$ and correlation $r = -0.540$. The results of the analysis showed that there was a significant relationship between the level of knowledge in self-management of hypertension with blood pressure, with a correlation coefficient indicating the strength of the relationship is strong. The negative correlation coefficient shows that the relationship between the level of knowledge in self-management of hypertension and with blood pressure of hypertensive patients has a negative relationship, where the better the level of knowledge in self-management of hypertension, the more normal the blood pressure value of hypertensive patients, and vice versa. (see Table 3).

Table 3. The Data on the Correlation between the Level of Knowledge in Self-Management of Hypertension and Blood Pressure at the Public Health Centre of Benowo, Surabaya, East Java Province, Indonesia in 2022 (n = 146).

Variable	Blood pressure								Total	
	Normal		Pre-hypertension		Hypertension level 1		Hypertension level 2			
	f	%	f	%	f	%	f	%	n	%
	Knowledge									
Low	1	0.7	0	0	5	3.4	24	16.4	30	20.5
Moderate	43	29.4	45	30.8	13	9	11	7.5	112	76.7
High	3	2.1	0	0	1	0.7	0	0	4	2.8
Total	47	32.2	45	30.8	19	13.1	35	23.9	146	100
Kendall's tau-b correlation test: p = 0.000, r = -0.540										

Primary Sources: Survey Data, 2022.

The association between the level of motivation in self-management of hypertension with blood pressure showed that the majority of respondents had a moderate level of motivation in self-management of hypertension and had blood pressure at the pre-hypertension level. The results of the statistical analysis of correlation using Kendall's tau-b correlation test, with a significance level < 0.05 , obtained a value of $p = 0.000$ and correlation $r = -0.547$. The analysis results showed a significant relationship between the level of motivation in self-management of hypertension with blood pressure, with a correlation coefficient indicating the strength of the relationship is strong. The negative correlation coefficient shows that the relationship between the level of motivation in self-management of hypertension and with blood pressure of hypertensive patients has a negative relationship, where the better the level of motivation in self-management of hypertension, the more normal the blood pressure value of hypertensive patients, and vice versa. (see Table 4).

Table 4. The Data on the Correlation between the Level of Motivation in Self-Management of Hypertension and Blood Pressure at the Public Health Centre of Benowo, Surabaya, East Java Province, Indonesia in 2022 (n = 146).

Variable	Blood pressure								Total	
	Normal		Pre-hypertension		Hypertension level 1		Hypertension level 2			
	f	%	f	%	f	%	f	%	n	%
Motivation										
Low	1	0.7	0	0	13	8.9	19	13	33	22.6
Moderate	33	22.6	43	29.4	5	3.4	16	11	97	66.4
High	13	8.9	2	1.4	1	0.7	0	0	16	11
	47	32.2	45	30.8	19	13	35	24	146	100
Kendall's tau-b correlation test: p = 0.000, r = -0.547										
Primary Sources: Survey Data, 2022.										

Primary Sources: Survey Data, 2022.

DISCUSSION

The results of the study showed a significant relationship with a strong relationship strength between the level of knowledge in self-management of hypertension and blood pressure of hypertensive patients, where the majority of respondents had sufficient knowledge in self-management of hypertension. Most respondents with sufficient knowledge in self-management of hypertension had blood pressure values in the pre-hypertension category.

This study is in line with the study conducted by Kassahun, which stated that the majority of knowledge levels in hypertensive patients are lacking and have an impact on perceptions related to hypertension self-management, so that the application of hypertension self-management also tends to

be low, which causes uncontrolled blood pressure in hypertensive patients (Worku Kassahun et al., 2020). Self-management refers to an individual's ability to manage symptoms, medications, physical and psychosocial conditions, and lifestyle changes to maintain a satisfactory quality of life (Omisakin & Ncama, 2011).

Researchers argue that the level of knowledge in hypertension self-management will affect the perception of hypertensive patients in carrying out the pillars of hypertension management, which include medical treatment of hypertension, compliance in taking hypertension medication, lifestyle modification to not smoking, not consuming alcohol, often consuming fruits and vegetables, often doing physical activity, and modifying diet to low salt and low fat. Analysis of the results of respondents' answers to the questionnaire on the level of knowledge in hypertension self-management showed that most respondents had insufficient knowledge in the indicators of the definition of hypertension, medical treatment of hypertension, and compliance in taking hypertension medication. Most respondents assumed that increased diastolic blood pressure did not indicate hypertension and tended to only focus on increasing systolic blood pressure. In addition, most respondents also had a wrong understanding of hypertension treatment, namely that every hypertensive patient must take medication as the best way of treatment, and that taking hypertension medication is only done when feeling sick. Most respondents also had a misconception between hypertension treatment and the lifestyle they were doing, namely that if a hypertensive patient had changed to a healthier lifestyle, they still needed medical treatment, and if they had taken hypertension medication regularly, they could eat salty foods without restrictions. This opinion is supported by a study exploring the knowledge level in primary and specialist care centers in Spain.. The results of the study stated that basic knowledge about hypertension remains low in these patients. Data shows that in terms of medication compliance, more than half of hypertension sufferers are not compliant with medication, which is dominated by forgetfulness. Less than half of hypertension sufferers understand the complications of hypertension, specifically in the kidneys. Less than half of hypertension sufferers are unable to explain what hypertension is, the purpose of measuring blood pressure, and the hypertension suffered throughout their lives (Estrada et al., 2020).

The correlation between the level of knowledge in self-management of hypertension and blood pressure of hypertensive patients should have a negative relationship direction, which means that the better the level of knowledge in self-management of hypertension, the lower or normal blood pressure value in hypertensive patients (controlled blood pressure). However, there is 1 respondent who has a low level of knowledge in self-management of hypertension, with blood pressure observation results in the normal blood pressure category. This is because the respondent has no history of other diseases besides hypertension, does not smoke, and does not consume alcohol. There is 1 respondent who has a good level of knowledge in self-management of hypertension, with blood pressure observation results in the category of level 1 hypertension blood pressure. This is because the respondent has a history of other diseases besides hypertension, namely diabetes mellitus (DM) and dyslipidemia.

The results of the study showed that there was a significant relationship between motivation in self-management of hypertension and blood pressure of hypertensive patients. The strength of the relationship between these variables is strong, where most respondents have moderate motivation in self-management of hypertension. Most respondents have moderate motivation in self-management of hypertension with blood pressure values in the pre-hypertension category.

This study is in line with research conducted by Su'ud, which shows that there is a significant relationship between motivation and self-care behaviour, where the higher the motivation, the higher the self-care behaviour, so that it can control the blood pressure values of hypertensive patients in the normal range and not increase (Su'ud et al., 2020b). Motivation can encourage someone to behave to achieve goals (Saam & Wahyuni, 2012). Motivation can also be a behavioural changer for individuals with hypertension in carrying out self-care, physical activity, changing diet patterns, and controlling weight (Han et al., 2014).

Researchers argue that motivation in hypertension self-management affects the behaviour of hypertension patients in carrying out the pillars of hypertension management, which include physical activity, low-sodium diet, low-fat diet, limiting alcohol consumption, not smoking, self-monitoring of blood pressure, taking hypertension medication, weight control, stress management, and visits to the doctor. Analysis of the results of respondents' answers to the motivation questionnaire in hypertension self-management showed that most respondents had low motivation in the indicators of physical activity, low-fat diet, self-monitoring of blood pressure, taking medication, and visits to the doctor. Most respondents rarely participate in physical activity regularly, walking for less than 30 minutes, and only 1-2 times per week. Researchers argue that because most residents in the city of Surabaya have busy schedules, to save time, they use transportation, so they rarely walk. In the low-fat diet indicator, most respondents rarely limit their consumption of foods containing fat, either saturated fat or trans-fat, never read nutrition labels to check the fat content in food, and rarely consume fruits and vegetables. Most respondents never take blood pressure measurements at home, but only at healthcare facilities. In addition, they also rarely go to the doctor regularly to control their blood pressure, so they rarely get a prescription for blood pressure-lowering drugs and rarely take blood pressure-lowering drugs.

The correlation between motivation in self-management of hypertension and blood pressure of hypertensive patients has a negative relationship direction, which means that the higher the motivation in self-management of hypertension, the lower or normal the blood pressure value in hypertensive patients (controlled blood pressure). However, there is 1 respondent who has low motivation in self-management of hypertension, with the results of blood pressure observations being in the category of controlled or normal blood pressure. This is because, based on the analysis of the results of the respondent's questionnaire, although the total value of the questionnaire results shows low motivation. However, the respondent always limits processed foods, always avoids alcohol consumption, always avoids environments with cigarette smoke, and always tries to stay away from things that cause stress. There is 1 respondent who has high motivation in self-management of hypertension, with the results of

blood pressure observations being in the category of hypertension blood pressure level 1. This is because the respondent is an active smoker and has a history of other diseases besides hypertension, namely DM.

Kurt and Gurdogan's study regarding the effect of self-management support on knowledge level, treatment compliance, and self-care management in patients with hypertension concluded that self-management support has shown positive effects in increasing hypertension knowledge level, adherence to hypertension treatment, self-care management, and blood pressure control in patients diagnosed with hypertension (Kurt & Gurdogan, 2022). The level of knowledge in self-management of hypertension in our study should be further improved. Moreover, the level of knowledge is related to blood pressure. Increasing knowledge of self-management in hypertension is expected to help control blood pressure. This is also supported by a study in Nigeria by Anyanti et al. regarding the level of knowledge, awareness, and management of hypertension and diabetes among adults in Imo and Kaduna states (Anyanti et al., 2021). The study concluded that despite the high awareness rate of hypertension and diabetes observed in this study and a relatively good knowledge about the two conditions, unhealthy lifestyle practices and non-regular routine screening abound among the respondents. Thus, there is a need to improve access to quality information about hypertension and diabetes aimed at motivating the adoption of healthy behaviors.

A randomized controlled trial (RCT) study proved an effect between group comparisons adjusted for pretest scores, showed a significant reduction in the mean systolic and diastolic blood pressure score, and increased adherence to medication due to intervention. However, the proportions of controlled systolic and diastolic blood pressure were not significantly different between groups. Self-management education tailored to health literacy significantly promotes medication adherence but has no significant effects on control of blood pressure (Delavar et al., 2020). Although the study did not have an impact on the control of blood pressure, it does not mean that there are no educational efforts regarding self-management for hypertension sufferers. According to the researchers, this is because self-management education in the study increased health literacy on medication adherence.

A study on health literacy by Fu et al. on hypertensive patients in outpatient settings in Hong Kong concluded that the association between subjects' health literacy or educational level and the quality of home blood pressure monitoring (HBPM) was variable (Fu et al., 2020). The interventional studies showed that increasing professional-patient contact time could improve patients' knowledge, efficacy, and quality of HBPM. Patients' educational level and literacy were not the limiting factors in obtaining high-quality HBPM. High-quality HBPM could be achieved by a structured educational intervention.

The above study stated that there was an increase in efficacy for hypertension sufferers. Efficacy factors are also explained in a systematic review and meta-analysis, which concluded that there is a positive potential from providing educational programs to manage blood pressure through increasing the self-efficacy of hypertension sufferers. The findings indicate that self-management education

programs for hypertension sufferers can increase their self-efficacy, which ultimately contributes to maintaining or controlling their blood pressure (Foroumandi et al., 2020). Therefore, further research is needed that aims to find various factors that influence the self-management of blood pressure in hypertension sufferers.

LIMITATIONS

The researcher is aware that there is potential for data bias in this study. This potential is related to the existence of self-reported data. The researcher accompanied the respondents during the questionnaire filling and conducted validity and reliability tests of the questionnaire to prevent data bias.

CONCLUSION

This study has several implications, especially regarding knowledge and motivation in the self-management of hypertension. First, for hypertensive patients, despite most respondents having blood pressure values in the pre-hypertension category, they still need to always improve their knowledge and motivation in self-management of hypertension. Second, the Public Health Centre to always make an improvement strategy in providing hypertensive patients with knowledge and motivation by paying attention to their self-management of hypertension.

AUTHOR CONTRIBUTION

Candra Panji Asmoro: Writing-Original draft, project administration, reviewing, and administering ethical clearance procedure.

Sriyono: Conceptualization, supervision, discussion, reviewed manuscript, visualization, and editing.

Clarita Maharani: Methodology, formal analysis, discussion, conducted research permit to the concerned office, and collected the data.

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CONFLICT OF INTEREST

We declared that our research is free from conflict of interest.

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