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Self-efficacy, Self-management, and Their Impact on Hypertensive Patients' Outcomes: A Study from Primary Health Centers in Indonesia

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ABSTRACT

Self-management requiring self-efficacy support is considered a cost-effective treatment in hypertensive patients who are influenced by a complex interaction of intrinsic and extrinsic factors. This study explored the factors related to self-efficacy, self-management and their impact on blood pressure and health-related quality of life (HRQoL) of hypertensive patients in primary health centers. A cross-sectional study from ten primary health centers in South Sumatra province, with 407 participants, used a questionnaire and medical records. The data were analysed descriptively, bivariate (chi-square), and multivariate logistic regression using the backward method. Factors correlated to self-efficacy include disease knowledge (OR = 5.538, P=0.000), social support (OR=4.330, P=0,000), disease courses (OR=2.807, P=0.000) and unemployed/retired (OR=2.174, P=0.002), while the factor correlated to self-management are disease knowledge (OR=2.223, P=0.002), unemployed/retired (OR=1.712, P=0.037), self-efficacy (OR=1.631, P=0.046), age (OR=1.594, P=0.023), and social support (OR=1.461, P=0.099). Self-management correlates with blood pressure (OR=5.045, P=0.000) and HRQoL (OR=0.541, P=0.005). Blood pressure is correlated with HRQoL (OR=1.703, R=0.027). Hypertensive patients with higher disease knowledge, higher social support, longer disease courses, and unemployed/retired were significantly more likely to have good self-efficacy. The higher disease knowledge, unemployed/retired, good self-efficacy, older age, and higher social support are more likely to have better self-management. Disease knowledge is most correlated with self-efficacy and self-management. Self-management has a positive effect on blood pressure and HRQoL. Controlled blood pressure is known to have a positive HRQoL. This study provides an overview of how the government and health care professionals recognise strong predictors and implement effective self-management interventions in hypertensive patients.

Keyword: hypertension, self-efficacy, self-management, health-related quality of life, blood pressures

INTRODUCTION

Hypertension is a chronic disease often found in primary health care and causes cardiovascular, cerebrovascular, kidney failure, and death due to sub-optimal blood pressure (Fox et al., 2004; Gakidou et al., 2017; Hsu et al., 2005; James et al., 2014). The world health organization (WHO) predict that hypertension globally is 22% of the world population. Southeast Asia is in the third-highest rank, with 25% of the total population. In

Indonesia, the incidence of hypertension in 2018 among the population aged 18 years increased, from 25.8% (2013) to 34.1% (2018) (Kemenkes, 2019).

Hypertensive patients should make lifestyle modifications and pharmacological antihypertensive treatment to achieve blood pressure targets. Lifestyle modification can reduce the need for medication, prevent or delay the onset of hypertension, improve blood pressure control, and reduce cardiovascular risk. However, the main disadvantage of lifestyle modification is the inconsistency of adherence over time (James et al., 2014; Whelton et al., 2018; Williams et al., 2018). To increase the endurance of lifestyle modifications, patients understand that hypertension is a disease condition that can improve the patient's confidence to live with a chronic disease (Warren-Findlow et al., 2012). Hypertensive patients must have good self-management to manage their disease, including lifestyle modification. Self-management is a behavioral adaptation process that aims to reduce stress and maintain quality of life by oneself and formal or informal resources (Lawless et al., 2021). Self-management is an individual's ability to manage their health condition with or without support from a health care provider. Self-management is the gold standard in treating chronic disease (Grady & Gough, 2014). Patients with chronic disease are responsible for managing their illness in their daily care, so self-management should be practiced throughout their lives (Lorig & Holman, 2003). Self-management provides significant benefits in patient outcomes and is considered a cost-effective overall option in treating hypertension (Khajeh et al., 2019). Self-management interventions can improve medication adherence (Williams et al., 2018), improve health-related quality of life, reduce health care costs, and prevent the development of chronic conditions (Ding et al., 2018).

A person who has an elevated level of self-efficacy is more likely to have better self-management of chronic diseases. Self-efficacy is a belief about changing behavior and is considered a general predictor of health-related behavior (Bandura, 1998). Indirectly, age, cardiovascular risk, disease course, disease knowledge, and social support are positively correlated with self-management through self-efficacy (Ding et al., 2018). Self-efficacy of hypertensive patients can be increased through self-management education (Foroumandi et al., 2020). Low disease knowledge and social support are associated with lower self-efficacy, slightly better self-management, and uncontrolled hypertension (Ding et al., 2018). Intrinsic and extrinsic factors interact in a complex way to influence self-efficacy and self-management behavior (Lawless et al., 2021; Shen et al., 2020). It is essential to understand the self-efficacy and self-management of hypertensive patients, considering that the factors that influence it are complex, to obtain a comprehensive understanding. This study aimed to determine the factors that correlate with self-efficacy and self-management and their effect on blood pressure and health-related quality of life in primary health centers. The results of this study are expected to aid the government and health care professionals in recognizing strong predictors and implementing effective strategies in designing self-management interventions in hypertensive patients. In addition, other areas can use the results of this study as a comparison.

METHODS AND MATERIAL

Setting and participants

The cross-sectional study design was conducted on hypertensive patients in ten primary health care centers in South Sumatra province (Ogan Komering Ulu Selatan district and Palembang city) using a convenience sampling technique from July to November 2021. In logistic regression, the sample size per predictor is 15-30 subjects (Palmer & O'Connell, 2009). For 11 predictors, the final sample size was estimated at 330. The number of samples was increased by 20% to overcome the non-response rate, so it became 396 participants. Finally, this study obtained 407 samples involved in this study. Inclusion criteria were diagnosed with essential hypertension, age ≥ 18 years, and taking or having ever taken antihypertensive drugs for≥ 3 months. Exclusion criteria were participants with severe complications (kidney failure, heart failure, stroke), pregnant/breastfeeding, and unable to communicate well. Participants gave written consent before participating in this study. This research has been reviewed and approved by the Medical and Health Ethics Committee of Universitas Gadjah Mada under the number KE/FK/0833/EC/2021.

Measurements

Data collection methods use two types: self-administered questionnaires and medical record data. The questionnaire included demographics (age, gender, education, working status, monthly

income, and marital status) and patient disease knowledge, social support, self-efficacy, self-management, and health-related quality of life: disease courses, comorbid events, and blood pressure obtained from medical records. All questionnaires used were first tested for validity and reliability.

Demographic-disease characteristics

Six demographic variables (age, gender, education, working status, monthly income, and marital status) and two disease variables (disease course and comorbidity) are present, and they are all categorical.

Outcomes

This study measured clinical outcome (blood pressure) and humanistic outcome (health-related quality of life). Controlled blood pressure is defined according to JNC VIII. (James et al., 2014). Humanistic outcomes were obtained using the Mini-Questionnaire of Quality of Life in Hypertension (MINICHAL).

Questionnaire

Disease's knowledge

The patient's level of disease knowledge was assessed using the Hypertension Knowledge-Level Scale (HK-LS) questionnaire, consisting of 22 questionnaire items. The HK-LS questionnaire was declared by evaluating its validity and reliability for respondents in Indonesia with internal consistency validity (Cronbach's alpha 0.758) (Jankowska-Polańska et al., 2016). In this research, the Cronbach's alpha was 0.713 – 0.862. Given a score of 1 for the correct answer and zero for the wrong answer or do not know, a total score of 22 is obtained if the participants answered all the questions correctly. The level of knowledge is divided into two levels based on the score obtained by the patient: ≤ 17, the level of disease knowledge is low, and 18-22, the level of disease knowledge is high.

Social support questionnaire

The questionnaire to assess social support, namely the Multidimensional Scale of Perceived Social Support (MSPSS), has excellent internal reliability with a Cronbach alpha coefficient of 0.85 - 0.9 (Zimet et al., 1988). This questionnaire has been widely used and adopted in various studies, including in hypertensive patients with a Cronbach alpha coefficient of 0.96 and internal reliability of 0,85 on schizophrenic patients (Schulz et al., 2008; Turan et al., 2019). Cronbach's alpha was 0.702 - 0.858 in this research. The MSPSS questionnaire consists of 12 items with three subscales: family, friends, and other essential individuals. Patients were asked to respond from 1 (strongly disagree) to 7 (strongly agree). The questionnaires are added up so that the score is in the range of 12 – 84. Based on this scale, the larger the score, the better the social support

Self-efficacy

Self-efficacy assessment using the Self-efficacy to Manage Hypertension (SeMH) questionnaire (Warren-Findlow et al., 2012), consisting of 5 question items. Score one for the answer, not up to five if very sure, then calculated and added up. The SeMH instrument content validity test with I-CVI and S-CVI/Ave obtained a value of 1.00. The results of the Face validity assessment show that respondents can respond to all questions well, with an acceptable agreement of 98%. Internal consistency is considered reliable, with a Cronbach's alpha value of 0.714.

Self-management

The self-management questionnaire uses the Persian Hypertension Self-Management Questionnaire (PHSmQ) (Khajeh et al., 2019), consisting of 31 questions, with five domains, self-integrity, self-regulation, interaction with health workers/people closest to them, self-monitoring, and adherence to the recommended regimen. Patients are asked to rate each item of the question to show how often they perform a series of behaviors by choosing one of the options from 5 Likert scales. Once the scores are added up in the range of 1 to 155, the higher the score, the better the self-management. The content validity test of the PHSmQ instrument with the I-CVI and S-CVI/Ave values obtained a value of 1.00. Face validity is considered good, with 99% acceptance of the questionnaire. Internal consistency reliability assessment with Cronbach alpha is in the range of 0.718 – 0.880, deemed reliable.

Health-related quality of life (HRQoL)

The instrument used is specific for hypertension, namely the Mini-Questionnaire of Quality of Life in Hypertension (MINICHAL) (Schulz et al., 2008). The tool used is specific for hypertension, consists of 17 questions, with two domains, namely mental status, somatic manifestations and 1 question to assess patients' perceptions of how hypertension and medication affect their quality of life. The patient chose one answer at all no, yes rarely, yes often, and yes often within the last seven days. Mini-Questionnaire of Quality of Life in Hypertension (MINICHAL)

questionnaire, processed by giving a score with a Likert scale with answer options, not at all (score = 0), yes, rarely (score = 1), yes, often (score =2) and yes, very often (score=3). Add up the scores so that they are in the range of 0 to 48. Based on this scale, the closer the results are to 0 (zero), the better the quality of life.

The content validity test of the MINICHAL instrument with the I-CVI and S-CVI/Ave values obtained a value of 1.00. Face validity shows that respondents can understand all the questions well and assess internal consistency reliability with Cronbach's alpha of 0.752 and 0.710.

Statistical analysis

We performed statistical analysis for demographic–disease characteristics and measured variables. Median cut-offs were used to dichotomize variables (age and disease course) and ordinal variables (self-efficacy (good vs. poor), social support (high vs. low), self-management (good vs. poor), and quality of life (high vs. low) to obtain equal group sizes. Disease knowledge is high (score 18-22) and low (score ≤ 17) (Jankowska-Polańska et al., 2016). Gender (female vs. male), employment status (Unemployed / Retired vs. employed), monthly income (Rp) (> 3.2 million vs. 3.2 million), marital status (married vs. single), comorbid diabetes mellitus (yes vs. no), and blood pressure (controlled vs. uncontrolled) is dichotomous categorical variables. Monthly income refers to the provincial minimum wage and blood pressure targets following JNC VIII. In contrast, the ordinal variable is higher (i.e., secondary school or above) and lower (i.e., lower than secondary school).

Bivariate statistics used the chi-square test to select factors related to self-efficacy and self-management as multivariate candidates. The variables were eliminated with a p-value > 0.250 in the bivariate test, and then these variables were selected using the backward method in logistic regression. *P*-value < 0.100 indicates a relationship in the process. The strength of the association was measured by the odds ratio (OR 95% confidence interval [CI]). Finally, a chi-square test was performed to find correlations between self-management and blood pressure, self-management with quality of life, and blood pressure with health-related quality of life by odds ratio (OR 95% confidence interval [CI]) to assess the strength of the association. Data analysis using SPSS version 26.0.

RESULTS AND DISCUSSION

Demographic – disease characteristic

This study recruited 407 hypertensive patients who received health services at primary health centers with a mean age of 58.38±9.451 years and disease courses of 3.8±3.583 years. The majority of participants were female (62.7%), had higher education (61.9%), were employed (56.3%), had a monthly income of IDR ≤ 3.2 million (82.1%), were married (86.0%), and did not have comorbid diabetes mellitus (77.6%) and uncontrolled blood pressure (73.7%) (Table I).

Disease knowledge, social support, self-efficacy, self-management, and health-related quality of life

This study supplies an overview of the factors correlated to self-efficacy and self-management and their impact on blood pressure and health-related quality of life in primary health centers in Indonesia. The participants had low hypertension knowledge (68.1%), low social support (52.1%), poor self-efficacy (59.7%), poor self-management (53.1%), and poor health-related quality of life (64.4%) (Table II).

Factors correlated to self-efficacy and self-management

Bivariate tests of demographics-disease, disease knowledge, social support, self-management, and self-efficacy (Table III). Variables correlated to self-efficacy were age (*P* = 0.000), gender (*P* = 0.020), working status (*P* = 0.000), disease course (*P* = 0.000), disease knowledge (*P* = 0.000), social support (*P* = 0.000), and self-management (P = 0.000). All variables were entered as multivariate candidates, plus education (P=0.127).

The results of the multivariate logistic regression of factors correlated with good self-efficacy (Table IV). Four of the eight tested variables were associated with self-efficacy through 5 steps: disease knowledge, social support, disease course, and working status. The final model is possible to use and meets the model requirements (Hosmer and Lemeshow: 0.555, omnibus test = 0.000), and the independent variable formed can explain the dependent variable of 41.1% (Nagelkerke R = 0.411). In this modeling, the independent variable formed can explain the dependent variable by 41.1%, and 58.89% is influenced by other factors not included in this study. Disease knowledge is known to be the most correlated factor in self-efficacy.

Table I. Demographic-disease characteristic participants

Characteristic		Number of participants (n=407)	Percentage (%)
Age, years	≤ 60	231	56.8
	> 60	176	43.2
Gender	Male	152	37.3
	Female	255	62.7
Education	Lower (if, e, lower than secondary school)	155	38.1
	Higher (i.e., secondary school or above)	252	61.9
Working status	Employed	229	56.3
	Unemployed /Retired	178	43.7
Monthly income (IDR)	≤ 3.2 million	334	82.1
	> 3.2 million	73	17.9
Marital status	Single	57	14.0
	Married	350	86.0
Disease course, years	≤ 2.3	204	50.1
	>2.3	203	49.9
Comorbid Diabetes Mellitus	No	316	77.6
	Yes	91	22.4
Blood pressure	Uncontrolled	300	73.7
	Controlled	107	26.3

Abbreviations: IDR, Indonesia Rupiah

Table II. Levels of disease knowledge, social support, self-efficacy, self-management, and health-related quality of life

Category		Number of participants (n=407)	Percentage (%)
Disease knowledge	Low (≤ 17)	227	68.1
	High (>18-22)	130	31.9
Social support	Low (≤ 62)	212	52.1
	High (63-84)	195	47.9
Self-efficacy	Poor (≤ 3.8)	242	59.5
	Good (3.8-5)	165	40.5
Self-management	Poor (≤ 103)	216	53.1
	Good (104-155)	191	46.9
Health-related quality of life	Low (12-48)	262	64.4
	High (≤ 11)	145	35.6

Patients with higher disease knowledge (OR = 5.538, P = 0.000), higher social support (OR = 4.330, P = 0.000), patients with longer disease courses (OR = 2.807, P = 0.000), and Patients who are unemployed/retired (OR = 2.174, P = 0.002) were significantly more likely to have good self-efficacy.

The results of the bivariate test of demographic-disease variables, disease knowledge, social support, self-efficacy, and self-management (Table III). Variables known to be significantly correlated were age (*P*=0.001), working status (*P*=0.001), disease course (*P*=0.026), disease knowledge (*P*=0.000), social support (*P*=0.000), and self-efficacy (*P*=0.000). All variables were entered as multivariate candidates.

The results of the multivariate logistic regression of the factors correlated with self-management were age, working status, disease knowledge, social support, and self-efficacy through 2 steps (Table IV). The final model is possible to use and meets the model requirements (Hosmer and Lemeshow: 0.070, omnibus test = 0.000), and the independent variable formed can explain the dependent variable of 16.5% (Nagelkerke R = 0.165).

Table III. Factors correlated with self-efficacy and self-management

Category		Self-efficacy		*P*	Self-management		*P*
		Good (n=242)	Poor (n=165)		Good (n=191)	Poor (n=216)	
Age, years	≤ 60	76 (32.9)	155 (67.1)	0.000*	91 (39.4)	140 (60.6)	0.001*
	> 60	89 (50.6)	87 (49.4)		100 (56.8)	76 (43.2)	
Gender	Male	50 (32.9)	102 (67.1)	0.020*	68 (44.7)	84 (55.3)	0.561
	Female	115 (45.1)	140 (54.9)		123 (48.2)	132 (51.8)	
Education	Elementary/no school	55 (35,5)	100 (64.5)	0.127*	70 (45.2)	85 (54.8)	0.647
	Secondary/university	110 (43.7)	142 (56.3)		121 (48.0)	131 (52.0)	
Working status	Employed	75 (32.8)	154 (67.2)	0.000*	90 (39.3)	139 (60.7)	0.001*
	Unemployed /Retired	90 (50.6)	88 (49.4)		101 (56.7)	77 (43.3)	
Monthly income (IDR)	≤ 3.2 million	138 (41.3)	196 (58.7)	0.581	157 (47.0)	177 (53.0)	1.000
	> 3.2 million	27 (37.0)	46 (63.0)		34 (46.6)	39 (53.4)	
Marital status	Single	22 (38.6)	35 (61.4)	0.860	30 (52.6)	27 (47.4)	0.431
	Married	143 (40.9)	207 (69.1)		161 (46.0)	189 (54.0)	
Disease course, years	≤ 2.3	56 (27.5)	148 (72.5)	0.000*	84 (41.2)	120 (58.8)	0.026*
	>2.3	109 (53.7)	94 (46.3)		107 (52.7)	96 (47.3)	
Comorbid	No	124 (39.2)	192 (60.8)	0.382	151 (47.8)	165 (52.2)	0.599
	Yes	41 (45,1)	50 (54.9)		40 (44.0)	51 (56.0)	
Disease knowledge	Low (≤ 17)	73 (26.4)	204 (73.6)	0.000*	107 (38.6)	170 (61.4)	0.000*
	High (>18-22)	92 (70.8)	38 (29.2)		84 (64.6)	46 (35.4)	
Social support	Low (≤ 62)	48 (22.6)	164 (77.4)	0.000*	78 (36.8)	134 (63.2)	0.000*
	High (63-84)	117 (60.0)	78 (40.0)		113 (57.9)	82 (42.1)	
Self-management	Poor (≤ 103)	62 (28.7)	154 (71.3)	0.000*			
	Good (104-155)	103 (53.9)	88 (46.1)				
Self-efficacy	Poor (≤ 3.8)				88 (36.4)	154 (63.6)	0.000*
	Good (3.8-5)				103 (62.4)	62 (37.6)	

Abbreviations: IDR, Indonesia Rupiah, *Shows a significant association

Table IV. Comparison of factors that influence self-efficacy and self-management (multivariate analysis)

Variables	Self-efficacy			Self-management		
	OR (95%CI)	*B*	*P*	OR (95%CI)	*B*	*P*
Age (1: > 60, 0: ≤ 60)	-			1.594 (1.030-2.469)	0.466	0.037
Working Status (1: Unemployed /Retired, 0: employed)	2.174 (1.318-3.586)	0.776	0.002	1.712 (1.101-2.661)	0.573	0.017
Disease knowledge (1: High, 0: Low)	5.538 (3.255-9.424)	1.712	0.000	2.223 (1.347-3.669)	0.799	0.002
Social support (1: High, 0: Low)	4.330 (2.631-7.128)	1.466	0.000	1.461 (0.932-2.292)	0.379	0.099
Disease course, year (1: >2.3, 0: ≤ 2.3)	2.807 (1.709-4.610)	1.032	0.000	-		
Self-efficacy (1: Good, 0: poor)	-			1.631 (1.009-2.636)	0.489	0.046

Factors influencing self-efficacy: multivariate logistic regression using the backward method. Independent variables: age, gender, working status, disease course, disease knowledge, social support, self-management, and education. Hosmer and Lemeshow: 0.555, omnibus test = 0.000, nagelkerke R=0.411; Factors influencing self-management: multivariate logistic regression using the backward method. Independent variables: age, working status, disease course, disease knowledge, social support, and self-efficacy. Hosmer and Lemeshow: 0.070, omnibus test: *P*=0.000, Nagelkerke R = 0.165

In this modeling, the independent variable formed can explain the dependent variable by 16.5%, and 83,5% is influenced by other factors not included in this study. Disease knowledge is the most correlated factor for self-management. Thus, the higher the disease knowledge (OR=2.223, *P*=0.002), patients who are unemployed/retired (OR=1.712, *P*=0.037), patients who have good self-efficacy (OR=1.631, *P*=0.046), patients with older age (OR=1.594, *P*=0.023) social support (OR=1.461, *P*=0.099) are more likely to have better self-management.

Comparison of correlated factors of self-efficacy and self-management

The same variables correlate with self-efficacy and self-management: working status, disease knowledge, and social support (Table IV). Disease knowledge correlates with self-efficacy (OR=5.538, *P*=0.000) and self-management (OR=2.223, *P*=0.002).

The factors affecting self-efficacy and self-management include working status, disease knowledge, and social support. Disease knowledge is the most influential factor in self-efficacy and self-management. Hypertensive patients with higher disease knowledge will have 5.538 times better self-efficacy and 2.223 times better self-management than patients with lower disease knowledge. Disease knowledge affects self-efficacy more than self-management. Previous studies reported a positive relationship between the level of knowledge of hypertension and self-efficacy and self-management (My et al., 2020). Self-efficacy is influenced by intentional non-adherence, low adherence to treatment, effectiveness of doctor communication, positive beliefs about treatment, and social support (Widiawatie et al., 2021). This study confirms earlier research that self-efficacy is positively and significantly related to self-management (Williams et al., 2018). These results are consistent with previous studies that High Blood Pressure - Health Literacy (HBP-HL) has the highest correlation with health-related quality of life, followed by self-management behavior, social support, and self-efficacy (Zhang et al., 2021). Earlier studies reported that younger patient age with lower cardiovascular risk, shorter disease course, lack of knowledge, and low level of social support predict low self-efficacy, lack of self-management, and poorly controlled blood pressure (Williams et al., 2018). Better self-management is associated with higher levels of knowledge, family support, and self-efficacy (Zimet et al., 1988). Patients who believe they have elevated levels of self-efficacy tend to rate their abilities positively and are therefore more likely to have better self-management of their chronic illness. Self-efficacy is considered a general predictor of health-related behavior (Hsu et al., 2005). Concepts related to self-efficacy and self-management in adult patients with chronic disease include temporal and spatial context, stressors, personal resources, informal social resources, formal social resources, behavioral adaptations, and quality of life outcomes (Khajeh et al., 2019). Self-efficacy of hypertensive patients can be increased through self-management education (Warren-Findlow et al., 2012). Other factors that affect self-efficacy include social support, disease course, and working status. Self-efficacy factors are intentional non-adherence, low medication adherence, physician communication effectiveness, positive beliefs about treatment, and social support (Widiawatie et al., 2021). Other factors influencing self-management are age, working status, disease knowledge, social support, and self-efficacy. Factors related to self-care practices are marital status, education, sources of self-care information, places to exercise, social support, and self-care agents (Ademe et al., 2019). There are varied factors that influence self-efficacy and self-management.

Factors correlated with patient's outcome

The correlation between self-management and blood pressure (OR=5.045, *P*=0.000) and the correlation between self-management and health-related quality of life (OR=0.541, *P*=0.005) (Table V). Patients with good self-management are likely to have their blood pressure controlled 5.045 times than patients with poor self-management. And the correlation between blood pressure and health-related quality of life (OR=1.703, P=0.027), confirming that hypertensive patients who had controlled blood pressure were more likely to have a 1.703 health-related quality of life than patients with uncontrolled blood pressure (Table VI).

In this study, it is known that self-management affects blood pressure and health-related quality of life. Patients with better self-management are likely to have controlled blood pressure 5.045 times and have a slightly better quality of life, which is 0.541 times compared to hypertensive patients with poor self-management. Factors have been identified as influencing the achievement of blood pressure control and health-related quality of life.

Table V. Correlation between self-management of blood pressure and Health Related Quality of Life

Variable	Category	Blood Pressure		*P*	OR (95% CI)	Health-related quality of life		*P*	OR (95% CI)
		Controlled (n=107)	Uncontrolled (n=300)			Good (n=145)	Poor (n=262)		
Self-management	Good	80 (41.9)	111 (58.1)	0.000	5.045 (3.075-8.278)	54 (28.3)	137 (71.7)	0.005	0.541 (0.358-0.820)
	Poor	27 (12.5)	189 (87.5)			91 (42.1)	125 (57.9)		

Table VI. Correlation between blood pressure and health-related quality of life

Variable	Category	Health-related quality of life		*P*	OR (95% CI)
		Good (n=145)	Poor (n=262)		
Blood pressure	Controlled	48 (44.9)	59 (55.1)	0.027	1.703 (1.084-2.674)
	Uncontrolled	97 (32.3)	203 (67.7)		

Personal factors include age, gender, race/ethnicity, and patient compliance, while system/provider factors consist of a place of care/routine treatment and the absence of therapeutic inertia (Carey et al., 2018). Limited outpatient care benefits, mainly for rural residents and longer disease duration, were associated with uncontrolled blood pressure in China (Qu et al., 2019). Good adherence to treatment is essential for blood pressure control in primary care (Menanga et al., 2016). Education on lifestyle modification was seen as a means of lowering blood pressure (Choi et al., 2018). Physical activity, duration on antihypertensive drugs of 2–4 years and five years or more, and high adherence to antihypertensive medications were positively associated with blood pressure control (Animut et al., 2018). Older age was associated with reasonable blood pressure control, and treatment modification was related to poor blood pressure control (Horsa et al., 2019). Implementation of self-management in hypertensive patients reduces the likelihood of having poor blood pressure control (Qu et al., 2019). The factor most often affecting the hypertensive patients' health-related quality of life is the perception of the economic burden, and it tends to occur in women compared to men (Xiao et al., 2019). Quality of life Hypertensive patients in the physical domain are associated with lower body mass index, higher muscle strength, and higher education level. In contrast, the social aspect positively correlated with education. Female patients have a poorer quality of life in the pain domain than male (O.Silva et al., 2020). Marital status, age, and duration of hypertension affected the physical field, while the cognitive part was influenced by marital status, gender, number of drugs, complications, and the course of hypertension (Khoirunnisa & Akhmad, 2019). Another study revealed that health-related quality of life with hypertension includes self-management efficacy, age, education level, and health literacy (Wang et al., 2017).

Self-management is a patient-centered intervention process that is directed at increasing knowledge about hypertension and skills and self-regulation by considering each person's specific contextual factors, health conditions, the physical and social environment of the patient so that through this self-management, patients improve their health behavior and ultimately, in turn, achieve positive therapeutic results and quality of life. Self-management encourages patients to take part in lifestyle changes, including diet, routine physical activity, self-monitoring of blood pressure, and especially adherence to antihypertensive therapy (Still et al., 2020). The essential elements for effective self-management are activating motivation for change, applying information from education and self-monitoring, developing skills, obtaining environmental resources, and building social support. Patients with chronic diseases are responsible for managing their illness in their daily care and must practice self-management throughout their lives (Lorig & Holman, 2003). Interventions that can be carried out include collaborating with doctors, nurses, and pharmacists, self-management with a simple system, reminders, group sessions, instruction combined with motivational strategies, health system support for monitoring, and financially supporting collaboration between health care

providers (Williams et al., 2018). Along with the development of technology, interventions for hypertensive patients to control blood pressure are also growing from initially using non-digital interventions to now using digital interventions. The use of digital technology for health, or digital health, has now been used in routine and innovative practices of information and communication technology (ICT) (WHO, 2019). In developing and implementing self-management interventions, the patient's benefit and acceptance should be considered. Therefore, the intervention must be designed based on the patient's characteristics and needs.

CONCLUSION

This study concluded that the factors associated with good self-efficacy in hypertensive patients are higher disease knowledge, higher social support, more extended disease course, and unemployment/retirement. In comparison, good self-management is affected by higher disease knowledge, unemployment /retirement, patients who have good health self-efficacy, older age, and higher social work status; knowledge of illness and social support are the same variables that affect self-efficacy and self-management, with knowledge of disease known to be most correlated. Good self-management correlated with controlled blood pressure and higher health-related quality of life. Self-management has a negligible effect on health-related quality of life. All health workers at primary health centers must conduct assessments and provide education about hypertension. Designing self-management intervention strategies to improve patient outcomes through team-based care and patient empowerment is essential. Further research finds other factors, including correlations with the suitability of pharmacological therapy and developing interventions to improve self-management tailored to the patient's condition.

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CONFLICT OF INTEREST

The authors declare no conflicts of interest.

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