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Correlation of Hypertension Self-Care Activity Level Effects Factors with Perceived Stress in Uncontrolled Hypertensive Patients

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Abstract

BACKGROUND: Stress is associated with hypertension self-care behavior activity. Low self-care can cause hypertension and make hypertension uncontrolled. Patients with uncontrolled hypertension are very susceptible to experiencing stress through self-care activities that they must do.

AIM: This study aims to identify the role of perceived stress on the self-care behavior of patients with uncontrolled hypertension. This study aims to assess the correlation of hypertension self-care activity level effect factors with perceived stress in patients with uncontrolled hypertension.

METHODS: This quantitative study with a cross-sectional design recruited 383 patients with uncontrolled hypertension at a community health center. The sampling technique is consecutive sampling. Perceived stress was assessed using Perceived Stress Sclae (PSS) and hypertension self-care activities were assessed using Hypertension Self-Care Activity Level Effect (H-SCALE). Data were analyzed using chi-square and multivariate test.

RESULTS: All respondents experienced stress, where 55.6% severed perceived stress and 44.4% moderate perceived stress. Severe stress occurs 60% in middle age, 54.2% in the elderly, 56.6% of male respondents, and 55.1% of female respondents. About 71.9% of respondents do not go to school, 69.2% are highly educated, and 56.6% of respondents do not work. Medication non-adherence (p = 0.000; OR = 0.941; 95% CI = 0.911–0.973) and weight management non-adherence (p = 0.006; OR = 0.956; 95% CI = 0.927–0.987) were positively correlated with the level of perceived stress in patients uncontrolled hypertension.

CONCLUSION: Improving coping strategies for stress by designing educational provisions about medication and weight management (diet and physical activity) are easily understood by people who do not experience education. Continuity and comprehensive education are needed.

Introduction

Hypertension cases tend to increase every year, so the World Health Organization estimates that hypertension cases in the world will increase to 29.2% in 2025 [1]. In Indonesia, cases of hypertension increased to 34.1% [2]. Other studies have shown that prolonged psychological stress can cause hypertension [3]. About 9.1% of psychological stress contributed to the prevalence of hypertension [4]. Increased cases of hypertension will have the opportunity to increase the possibility of uncontrolled hypertension. Several studies have shown that patients with uncontrolled hypertension tend to be high. In America, the rate of uncontrolled hypertension is close to 53.2% [5] and 58% in South Asia [6].

Poor self-care behavior causes high rates of uncontrolled hypertension. Self-care behavior can be adherence to medication, diet, activity, weight management, not smoking, and alcohol consumption [7], [8], [9], [10]. Hypertension is a silent killer disease and is asymptomatic, so many people are unaware of it [11]. Poor self-care behavior can describe health risk behaviors in individuals. The study found that high-risk health behaviors such as low intake of fruit or vegetables, daily smoking, and physical inactivity will affect a person's perception of stress [9]. High-risk behaviors can lead to higher morbidity and mortality. Morbidity can be in the form of 51% having a stroke and 63% heart failure, kidney failure, and retinopathy [12].

Blood pressure control occurs when a person can perform self-care adherence in the long term as recommended by Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure (JNC7) for hypertension control [13]. In reality, this is difficult for most individuals. This condition can be a stressor for the emergence of stress in people with hypertension. Studies have found that stress that lasts for a few days can reduce social motivation and social interaction [14]. Researchers think

stress assessment needs to be studied further to see the relationship between performing self-care activities and perceived stress. Stress can cause hypertension, so the chance of severe stress can occur in patients with uncontrolled hypertension.

Methodology

Methods

Design

We used a cross-sectional design in patients with uncontrolled hypertension in Padang, West Sumatra Province, Indonesia, from January to May 2020. This study used three public health centers that have the highest hypertension rates in Padang.

Sample

The research subjects were 383 patients with uncontrolled hypertension from three community health centers in Padang city. The sampling technique was consecutive sampling. Sample criteria for this study were hypertensive patients with blood pressure ≥140/90 mmHg, did not have dementia, could communicate well, and did not have comorbidities such as stroke, heart failure, kidney failure, and age >35 years. The exclusion criteria were hypertensive patients with complications and refused to be respondents.

Instrument

Self-care assessment

We used Hypertension Self-Care Activity Level Effects (H-SCALE) for self-care assessment of hypertensive patients, H-SCALE consists of JNC7 recommended hypertension self-care activities. The H-SCALE has six subscales, namely, medication adherence (items 1–3), dietary approaches to stop hypertension (DASH) adherence (items 4–15), physical activity adherence (items 16–17), adherence to avoid smoking (items 18–19), weight management adherence (items 20–29), and adherence to avoid alcohol consumption (items 30). Medication adherence score was 21, DASH diet adherence score was ≥72, physical activity adherence score was ≥8, tobacco exposure score was 0, and weight management adherence score was ≥40 [14], [15].

Perceived stress assessment

We used a 14-item perceived stress scale (PSS). Participants respond to each question on a Likert scale with the conditions (0 = never; 1 = almost never; 2 = sometimes; 3 = fairly often; and 4 = very often). Items 4, 5, 6, 7, 9, 10, and 13 are scored in the reverse direction. Stress level assessment consists of three categories: Mild stress level (score range 1–14), moderate stress level (score range 15–26), and severe stress level (score >26) [16].

Ethical aspect and declaration of interest statement

Research ethics approval was obtained from the ethics committee of the Faculty of Medicine, Andalas University (No: 459/KEP/FK/2018), as well as the Padang City Health Office, West Sumatra Province, Indonesia. Informed consent was given to the participants before study.

Data analysis

The data were analyzed using univariate (frequency tabulation and percentage) and bivariate (Chi-square and multivariate tests).

Results

Characteristics of the respondents

The characteristics of the respondents are presented in Table 1. Of the 383 respondents are mostly elderly (75.2 %), female (66.3 %), have low education (88.3 %), unemployed (86.9 %). More than half of the respondents suffered from hypertension 0-5 years, 64 % had normal weight, and more than half (55.6 %) had severe perceived stress.

Table 2 shows no relationship between the characteristics and the perceived stress level in uncontrolled hypertensive patients. We found that elderly and middle-aged respondents both had severe perceived stress levels. The percentage of middle-aged people with stress is more significant (60%) than the elderly (54.2%). Male respondents (56.6%) experienced severe perceived stress levels compared to women (55.1%). Respondents who were not in school had 71.9% severe perceived stress levels and followed 69.2% highly educated. About 56.6% severe perceived stress in unemployed respondents. The experience of hypertensive patients suffering hypertension <5 years until ≥5 years both had severe perceived stress. In addition, more than half of respondents with various levels of BMI are at risk of experiencing severe stress.

Table 3 shows that there is a relationship between medication ($p = 0.003$) and weight management ($p = 0.049$) with the level of perceived stress with $p < 0.05$.

Table 1: Respondents characteristic

Characteristic	Frequencies (n)	Percentage
Age		
Middle age (46–55 years)	95	24.8
Elderly (>55 years)	288	75.2
Gender		
Male	129	33.7
Female	254	66.3
Education		
Not in school	32	8.4
Lower (basic until senior high school)	338	88.3
Higher (college graduate)	13	3.4
Employment status		
Employed	50	13.1
Unemployed	333	86.9
Hypertension periods		
0–5 years	196	51.2
6–10 years	115	30
>10 years	72	18.8
BMI		
Thin	7	1.8
Normal	245	64
Overweight	71	18.5
Obesity	60	15.7
Perceived stress		
Moderate	170	44.4
Severe	213	55.6

BMI: Body mass index.

Table 3: Differences of hypertension self-care activities based on perceived stress in uncontrolled hypertensive patients

H-SCALE	Total (n = 383) (%)	Perceived stress		p value
		Moderate, n (%)	Severe, n (%)	
Medication				
Non-adherence	245 (36)	95 (38.8)	150 (61.2)	0.003*
Adherence	138 (64)	75 (54.3)	63 (45.7)	
DASH diet				
Non-adherence	323 (84.3)	142 (44)	181 (56)	0.699
Adherence	60 (13.6)	28 (46.7)	32 (53.3)	
Physical activity				
Non-adherence	331 (86.4)	142 (42.9)	189 (57.4)	0.140
Adherence	52 (13.6)	28 (53.8)	24 (46.2)	
Tobacco exposure				
Non-adherence	82 (21.4)	33 (40.2)	49 (59.8)	0.394
Adherence	301 (78.6)	137 (45.5)	164 (54.5)	
Weight management				
Non-adherence	316 (82.5)	133 (42.1)	183 (57.9)	0.049*
Adherence	67 (17.5)	37 (55.2)	30 (44.8)	

*Significant. H-SCALE: Hypertension Self-Care Activity Level Effects, DASH: Dietary approaches to stop hypertension.

Table 4 shows that medication and weight management are the dominant factors influencing the PSS. The odds ratio results explained that non-adherence to medication makes 0.94 times severe perceived stress and also the more non-adherence to weight management causes 0.96 times to become high perceived stress.

Table 2: Characteristic respondents distribution based on perceived stress scale

Characteristics	Total (n = 383)	Perceived stress		*p value
		Moderate	Severe	
Age				
Middle age (46–55 years)	95 (24.8)	38 (40)	57 (60)	0.322
Elderly (>55 years)	288 (75.2)	132 (45.8)	156 (54.2)	
Gender				
Male	129 (33.7)	56 (43.4)	73 (56.6)	0.784
Female	254 (66.3)	114 (44.9)	140 (55.1)	
Education				
Not in school	32 (8.4)	9 (28.1)	23 (71.9)	0.278
Lower (basic until senior high school)	338 (88.3)	157 (46.4)	181 (53.6)	
Higher (college graduate)	13 (3.4)	4 (30.8)	9 (69.2)	
Employment status				
Employed	50 (13.1)	25 (50)	25 (50)	0.392
Unemployed	333 (86.9)	145 (43.5)	188 (56.5)	
Hypertension periods				
0–5 years	196 (51.2)	82 (41.8)	114 (58.2)	0.426
6–10 years	115 (30)	56 (48.7)	59 (51.3)	
>10 years	72 (18.8)	32 (44.4)	40 (55.6)	
BMI				
Thin	7 (1.8)	5 (71.4)	2 (28.6)	0.439
Normal	245 (64)	106 (43.3)	139 (56.7)	
Overweight	71 (18.5)	31 (43.7)	40 (56.3)	
Obesity	60 (15.7)	28 (46.7)	32 (53.3)	

*Chi-square analysis. BMI: Body mass index.

Table 4: Dominant variables affecting perceived stress scale

	B	p	Exp (B)	95% C.I. for EXP (B)
Medication	−0.060	0.000	0.941	0.911–0.973
Weight management	−0.045	0.006	0.956	0.927–0.987

Table 5 shows that the difficulty of medication adherence in patients with uncontrolled hypertension is taking blood pressure pills simultaneously every day at the same time. In addition, the percentage of respondents' weight management compliance behavior is still poor, such as consuming processed meat, high-salt foods, smoked meat and smoked fish, salty food at the table, and preferring restaurant and ready-to-eat food. It has not become a habit to read the contents of food when going to buy food at the store, lack of physical activity that can lose or maintain weight in the right frequency and duration. Respondents are still dominated as passive smokers.

Discussion

Studies on patients with uncontrolled hypertension found that all respondents felt stressed. 55.6% had a severe perceived stress scale, and had a moderate stress scale. The stress felt by respondents was caused by medication and weight management adherence activity that respondents must have adhered it. Table 3 shows that there is a relationship between medication adherence ($p = 0.003$) and weight management adherence ($p = 0.049$) with perceived stress levels with $p < 0.05$. This finding supports by another study that health risk behaviors can cause perceived stress, increased uncontrolled blood pressure, and increased morbidity and mortality in hypertensive patients. These risky behaviors can be in the form of an unhealthy lifestyle, non-adherence medication, non-adherence activity, and alcohol abuse [9].

Table 4 describes the dominant factor that causes the perceived high level of stress: weight management compliance ($p = 0.006$, OR 0.956, 95% CI 0.927–0.987). Weight management compliance is a factor that causes high perceived stress levels. The odds ratio results show that the higher a person's non-compliance with weight management, the risk 0.956 times for the respondent to experience increasingly severe stress. Non-adherence to weight management is the low adherence to low-fat and low-salt foods such as fast food, processed meat, and salty foods (Table 5). This unhealthy dietary pattern behavior is a sign of someone experiencing stress. This risky health behavior is a form of pleasant behavior for hypertensive patients where this behavior can occur due to the stress felt by the individual [17]. Patients with hypertension are not aware of the dangers posed by this behavior.

Prolonged stress can narrow one's perception, weaken memory and attention in cognitive activities,

and one's behavior becomes negative [18]. This study found that the resulting stress shows low adherence to exercise to lose and maintain weight (39.4%), 47.7% of respondents care about reading the food contents to be purchased, 53.8% of respondents are obedient to buying healthy food. The study states that physiologically, perceived stress will trigger the release of the hormone cortisol, which impacts increasing appetite so that the quality of nutritious food consumed is low. Prolonged stress will trigger eating foods that are high in calories and energy-dense. Many studies show that unhealthy eating behavior is a marker of stress, so that the more severe the perceived stress makes the tendency to eat freely [19], [20]. Our findings prove that respondents who have an average BMI of body weight to obesity show a percentage of severe stress from 53.6% to 56.7%. Increased stress can cause uncontrolled eating behavior, causing an increase in body weight through lipogenesis in the body [21].

In terms of characteristics, the study found that most of the respondents were women (66.3%), with 55.1% of women experiencing more severe stress. Other findings also showed that out of 129 men, 73 respondents (56.6%) experienced severe perceived stress. It indicates that male respondents have a slightly larger percentage than female respondents. An increase in uncontrolled eating behavior and emotional eating was followed by a high perception of stress [22]. These findings require special attention for patients with uncontrolled hypertension, both men and women, to manage stress management by understanding healthy eating behavior for hypertensive patients. This condition will be the focus of further attention.

Table 5: Distribution of respondents' answers for Hypertension Self-Care Activity Level Effects

Items	Percentage adherence
Medication adherence	
Take blood pressure pills	68.6
Take blood pressure pills at the same time every day	62.9
Take the recommended number of blood pressure pills	65.7
DASH diet adherence	
Follow a healthy eating plan as prescribed by physician	55.7
Eat potato chips, salted nuts, or salted popcorn	24.3
Eat processed meats such as hamburger, nugget, meatballs or sausage etc.	15.7
Eat smoked meat or smoked fish	20.0
Eat pickles, olives, or other vegetables in brine	17.1
Eat≥5 servings of fruits and vegetables	42.9
Eat frozen prepared dinners or frozen pizza	85.7
Eat packaged bakery goods	65.7
Salt food at the table	24.3
Add salt when cooking	61.4
Eat fried foods such as chicken, French fries, or fish	64.3
Avoid eating fatty foods and salt items	47.1
Physical activity adherence	
Do at least 30 min total of physical activity	47.5
Do a specific exercise activity (such as swimming, walking, or biking) other than what you do around the house or as part of your work?	42.5
Tobacco exposure	
Smoke a cigarette or cigar, even just one puff	70.0
Stay in a room or ride in an enclosed vehicle while someone was smoking	60.0
Alcohol	
Drink alcohol in a week	100
Management weight adherence	
I am careful about what I eat.	69
I read food labels when I grocery shop.	47.7
I exercise in order to lose or maintain weight.	39.4
I have cut out drinking sugary sodas and sweet tea.	57.8
I eat smaller portions or eat fewer portions	62.4
I have stopped buying or bringing unhealthy foods into my home.	53.8
I have cut out or limit some foods that I like but that are not good for me.	51.5
I eat at restaurants or fast food places less often.	44.6
I substitute healthier foods for things that I used to eat.	59.5
I have modified my recipes when I cook.	56.6

DASH: Dietary approaches to stop hypertension.

The following finding is a significant relationship between medication adherence and perceived stress levels. The study results found adherence to taking medication (p = 0.000, OR 0.941, 95% CI 0.911–0.973). It means that the higher non-adherence medication, the risk is 0.94 times for the respondent to experience increasingly severe stress. Another study states that medicine is essential in controlling hypertension, so medication adherence is a priority issue that must improve [11]. High non-adherence to taking medication will be at risk for the occurrence of resistant hypertension [23], causing cardiovascular, cerebrovascular, kidney and death disorders [8], [24]. The non-adherence shown by respondents in this study found that the percentage of medication adherence was still low. The lowest rate of adherence was taking hypertension medication at the same time every day (62.9%), taking medicines according to doctor's recommendations (65.7%), and taking medication every day (68.6%). This percentage is far from the 100% target recommended by the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure (JNC-VII) adopted by Warren Findlow through the Hypertension Self-Care Activity Level Effects measure [15].

Another study that cause non-adherence to treatment is that there is still no new drug to control blood pressure. It made people with hypertension bored and stressed about their disease. In addition, the physical symptoms caused by taking hypertension drugs have similar symptoms of perceived stress, so that people with hypertension do not comply with taking drugs [25]. The demands of therapy that require people with hypertension to take medication for life to control blood pressure make respondents experience stress without realizing it.

Poor treatment will increase the treatment time provided by doctors and prolong the hospitalization of hypertensive patients [26]. Several other studies confirmed this finding that medication is an essential factor for blood pressure control in hypertensive patients [4]. This condition makes severe perceived stress, so patients with uncontrolled hypertension need stress management by providing comprehensive education to understand the importance of taking medication in controlling blood pressure.

This study found that uncontrolled hypertension, which has a perception of severe stress, occurs 60% in middle age, 56.6% are male, 71.9% of respondents are not in school, and 69.2% are highly educated. This finding contrasts with the results of existing studies

that the elderly have better medication adherence and thus less stress [27], [28]. Gender, although there is no definite evidence that there is a difference in adherence to medication therapy. This study found that both sexes experienced stress [29], with males experiencing severe stress more predominantly than females. It is related to the many men who are still working. Another finding from this study found that not only did respondents who did not go to school experience severe stress as much as 71.9% but higher education also had a relatively large percentage of 69.2%. It should be the focus of attention for health workers to find the right stress reduction strategy by providing education that can achieve these targets.

Conclusion

Improving coping strategies for stress by designing education about medication and weight management (diet, physical activity) is easily understood by people who do not experience education. Continuity and comprehensive education are needed. Education should be given together with the family to help the elderly with hypertension in managing their stress. Good stress management is expected to improve medication adherence and weight management so that it has an impact on controlling blood pressure in hypertensive patients.

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