Health Belief Model: Determinantsof Hypertension Prevention BehaviorinAdults at Community Health Center, Sukoharjo, Central Java

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ABSTRACT

Background: According the WHO the estimated of age standarized prevalence of high blood presure in adults age 25+ years in Indonesia in 2008 was 42.7% in men and 39.2% in women. Hypertension deaths in Indonesia reached 42,226 or 3.02% of total deaths in 2014. Age-adjusted death rate was 25.26 per 100,000 of population (ranked 29 in the world). The prevalence of hypertension in Sukoharjo, Central Java, was 36,827 cases in 2015. This studyaimed to examine the determinantshypertension prevention behavior using Health Belief Model.

Subjects and Method: This was an analytic and observational study with cross sectional design. This study was conducted in Sukoharjo, Central Java, Indonesia, from September to October2016. A total of 160 patients visiting Sukoharjo Community Health Center, Sukoharjo, Central Java, was selected for this study bysimple random sampling. The sample consisted of83 (51.9%) patients aged <35 years and 77 (48.1%) patients aged ≥35 years.The exogenous variables were perceived susceptibility, perceived seriousness, cues to action, perceived benefits, perceived barrier, and self efficacy. The endogenous variables were perceived threat and hypertension prevention behavior. The data were collected byquestionnaire and analyzed by path analysis.

Results: The path model showed goodness of fit with indices as follows: CMIN= 9.03, p=0.172, GFI= 0.99, NFI= 0.99, CFI= 1.00, and RMSEA= 0.06. Self-efficacy (b= 0.11; p<0.001; β=0.31), perceived benefit (b=0.12; p=0.005), and perceived threat (b=-0.10; p<0.001), had positive and statistically significant effect onhypertension prevention behavior. Perceived barrier (b=-0.10; p<0.001) had negative and statistically significant effect onhypertension prevention behavior. Perceived vulnerability (b=0.35; p<0.001), perceived of seriousness (b=0.48; p<0.001), and cues to action (b= 0.33; p<0.001) had indirect positive effects on hypertension prevention behavior.

Conclusion: Self-efficacy, perceived benefit, and perceived threat have positive effect onhypertension prevention behavior. Perceived barrier have negative effect onhypertension prevention behavior. Perceived vulnerability, perceived of seriousness, and cues to action have indirect positive effects on hypertension prevention behavior.

Keyword: hypertension, prevention behavior,health belief model.

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BACKGROUND

Hypertension is a non-communicable disease that can be a big and serious problem because the high prevalence of hypertension tends to increase. In 2013, there was an increase in the prevalence of hypertension based on interview (whether health workers had diagnosed patients and whether these patients had taken hypertension medication or not) from 7.6% in 2007 to 9.5% (Sukoharjo District Health Office, 2013).

The prevalence of hypertension in Sukoharjoin 2010 was 6.6%, in 2011 was

7.29%, and in 2012 was 5.78%. Whereas in 2013, based on reports from community health centers the number of patients with hypertension was 21,731 cases, in 2014 it was 20,516 cases and in 2015 it was 36,827 cases.

There are several factors that can increase a person's risk of suffering from hypertension. The trigger factors for hypertension can be divided into two, namely factors that cannot be controlled (such as gender, genetics and age) and factors that can be controlled (such as obesity, lack of exercise, smoking, and excessive consumption of salt and fat)Sigarlaki (2006).

The prevalence of hypertension mostly occurs in the elderly group, however it turns out that the prevalence of hypertension in the productive age group tends to increase from year to year. According to the Ministry of Health of the Republic of Indonesia (2012), based on the results of the Basic Health Research 2007, most cases of hypertension in the community have not been diagnosed. This can be seen from the results of blood pressure measurements at the age of 18 years and above which is found that the prevalence of hypertension in Indonesia was 31.7%, where only 7.2% of the population who already knew that they had hypertension. 76% of cases of hypertension in the community have not been diagnosed and the public does not know yet that they have hypertension.

This condition causes hypertension in society and it is known as a silent killer because hypertension generally occurs without any symptoms or asymptomatic. Hypertension develops slowly, but is potentially very dangerous because it is a major risk factor for the development of heart disease and stroke (Dalimartaet al., 2008).

Because hypertension is a silent killer disease, the only way is to do prevention. Efforts to prevent and control hypertension must begin by increasing public awareness and making changes in lifestyle towards a healthier one. To understand and practice of the right lifestyle and avoid disease, individuals and communities need to learn the right behavior (Miller, 2011). In this case, the health trust model (HBM) is the first theory in the health field that is related to health behavior. HBM can explain preventive behavior and individual responses to disease. The health belief model confirms that a person's perceived vulnerability and efficacy of treatment can influence a person's decision on behavior towards his health.

The purpose of this study is to analyze the factors that influence the behavior of prevention of hypertension using the theory of Health Belief Model.

SUBJECTS AND METHOD

The design of the study used was correlational analytic with cross sectional approach. The study was conducted in September - October 2016 at community health center of Sukoharjo, Central Java. The study population was 42,927 adults. The sample of the study was 160 adults with simple random sampling. Exogenous variables includededperceived vulnerability, perceived seriousness, cues to action, perceived benefits, perceived barriers, and self-efficacy. The endogenous variables wereperceived threats and hypertension prevention behavior.

The technique of collecting data used was questionnaires that previously had been tested for validity and reliability. Data analysis used IBM SPSS AMOS 22 path analysis. Ethics of study include informed consent, anonymity, confidentiality, and ethical clearance.

RESULTS

1. Sample Characteristics

The results of the characteristics of the subjects of the study in table 1 shows that of 160 the majority of subjects of the study were <35 years old (51.90%). Most of the

subjects of the study were female (61.30%). Most of the subjects of the study had a high school education and above (63.10%). Most of thesubjects of the study worked as private employees (28.10%).

Table 1. Sample characteristics

Characteristics	n	%
Age		
< 35 years	83	51.90
≥ 35 years	77	48.10
Gender		
Male	62	38.80
Female	98	61.30
Education		
< Senior High School	59	36.90
>Senior High School	101	63.10
Occupation		
Civil Servant	7	4.40
Private Employee	45	28.10
Farmer	23	14.40
Trader	23	14.40
Entrepreneur	8	5.00
Housewife	38	23.80
Students/college students	16	10.00

Most of the subjects of the study had perceived vulnerability, as many as 119 subjects of the study (74.40%). Most of the subjects of the study had perceived unseriousnessas many as 118 (73.80%). Most of the subjects of the study had weak Cues to action, as many as 116 (72.50%). Most of the subjects of the study had low perceived benefit, it were 119 (74.40%).

Most of the subjects of the study had low perceived barrier, it were 117 subjects of the study (73.10%). Most of the subjects of the study had weak self-efficacy, it were 119 subjects of the study (74.40%). Most of the subjects of study had low threat perceptions which were 109 (68.10%). Most of the subjects of the study did not prevent hypertension behavior, it were 136 subjects of the study (85%).

2. Path Analysis

Data analysis used was Path Analysis with the help of IBM SPSS AMOS version 22. The Initial Model in path analysis consisted of several stages as follows:

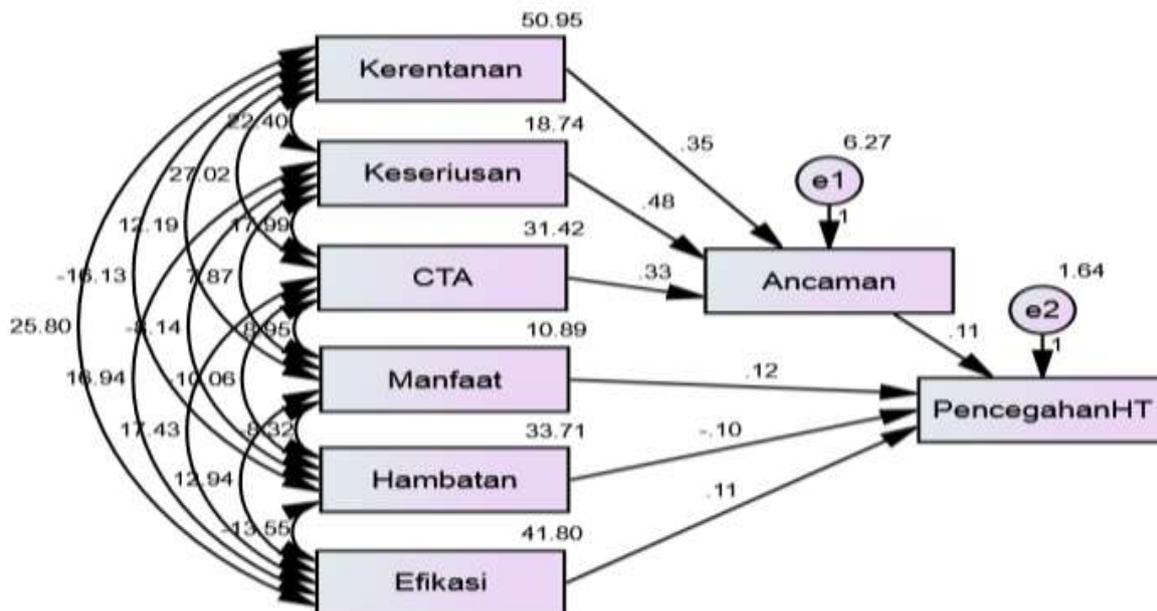a. Model specifications included the initial model in path analysis.

b. Model identification

Measured variables were 8, endogenous variables were 2 variables, exogenous variables were 6, and the number of parameters was 22. Degree of freedom (df) = (number of measured variables x (number of measured variables + 1) / 2- (endogenous variables + exogenous variables + number of parameters) = (8x9) / 2– (2 + 6 + 22) = 6. Identification of the model in this path analysis obtained the df value that over-identified. Therefore, path analysis can be done.

c. Suitability of Models and Parameter Estimates

The path analysis model made by the researcher based on the theory was checked for its suitability with the best variable association model by computer (SPSS) called as the saturation model, which was made based on sample data collected by researchers. Figure 1 shows the structural model after an estimation using IBM SPSS

AMOS 22. The indicator was used to determine the suitability of the model in the path analysis in table 2 that shows the Goodness of Fit Measure. From table 2, the CMIN fit index results were 9.03 with p = 0.172 (> 0.05); GFI = 0.99 (> 0.90); NFI = 0.99 (> 0.90); CFI 0.99 (> 0.90); RMSEA = 0.06 (<0.05) which meant that the empirical model met the criteria specified and stated in accordance with empirical data.

Gambar 1. Structural model with estimation

Table 2. shows that the results of calculations using IBM SPSS AMOS 22 computer software program, obtained a non-standardized path coefficient value (b) between self-efficacy and hypertention prevention behavior was positive andwas equal to 0.11, SE value 0.02, p <0.001, and path coefficient value standardized (β) which was 0.31, declared significant. These results indicated that each unit increase of self-efficacy would increase the hypertension prevention behavior score by 0.31.

The non-standardized path coefficient value (b) between the perceived benefits and hypertension prevention behavior was positive, which was equal to 0.12, the value

of S.E 0.04, p 0.005, and the standardized path coefficient (β) value of 0.17, was significant. These results indicated that each unit increase of perceived benefit would increase the hypertension prevention behavior score by 0.17.

The non-standardized path coefficient (b) between perceived barrier and hypertensionprevention behavior was negative, which was -0.10, the value of S.E 0.02, p <0.001, and the standardized path coefficient (β) value was -0.26, it was stated to be significant. These results indicated that every unit increase of perceived benefit score would increase the hypertension prevention behavior score by 0.17.

The non-standardized path coefficient value (b) between the perceived threat and hypertension prevention behavior was positive, which was equal to 0.11, the value of S.E 0.02, p <0.001, and the standardized path coefficient (β) value was 0.31, and it was declared significant. These results indicated that each unit increase of perceived threat score would increase the hypertension prevention behavior score by 0.11.

Table2. The Results of the Path Analysis of the Application of Health Belief Model onFactors Affecting Prevention of Hypertension

DependentVariables	Independent Variables	Unstandardized Path Coefficient (b)	S.E	p	Standardized Path Coefficient(β)
Direct					
Behavior←	Efficacy	0.11	0.02	<0.001	0.31
Behavior←	Benefits	0.12	0.04	0.005	0.17
Behavior←	Obstacles	-0.10	0.02	<0.001	-0.26
Behavior←	Threats	0.11	0.02	<0.001	0.31
Indirect					
Threat←	Vulnerability	0.35	0.05	<0.001	0.39
Threat←	Seriousness	0.48	0.08	<0.001	0.33
Threat←	CTA	0.33	0.05	<0.001	0.29
N Observation = 160					
Fit Model					
CMIN (X^2)= 9.032					
p= 0.172 ($\geq$ 0.05)					
CFI= 0.99	($\geq$0.90)				
NFI= 0.99	($\geq$0.90)				
GFI= 0.99	($\geq$0.90)				
RMSEA= 0.00	($\leq$0.01)				

The non-standardized path coefficient value (b) between perceived vulnerability and perceived threat was positive and was equal to 0.35, the value of SE= 0.04, p <0.001 and the standardized path coefficient (β) value was 0.39, it was declared significant. These results indicated that each unit increase of perception of vulnerability would increase the perception score of 0.35.

The non-standardized path coefficient (b) between perceived seriousness and perceived threat was positive, which was equal to 0.48, the value of SE= 0.08 with p <0.001, and the standardized path coefficient (β) value of 0.33 was declared significant. These results indicated that each unit increase of perceived seriousness would increase the perceived threat score by 0.48.

The non-standardized path coefficient value (b) between cues to action and perceived threat was positive and was equal to 0.33, the value of SE= 0.05 with p <0.001, and the standardized path coefficient (β) value was 0.29, and it was declared significant. These results indicated that each unit increase of cues to actionscore would increase the perceived threat score by 0.33.

d. Model specification

The model in this study was in accordance with the sample data as indicated by the saturation model and also the path coefficient which was more than zero and statistically significant. So, it was not necessary to recreate the path analysis model.

DISCUSSION

1. Association between perceived vulnerability and hypertension prevention behavior through perceived threat

There is an indirect association between perceived vulnerability and hypertension prevention behavior through variables between perceived threats.

A study from Adawiyah (2014) stated that there is an association between perceived vulnerability and hypertension prevention behavior (b= 0.60; p= 0.001).

Perceived vulnerability refers to subjective judgments of risks to health problems. Individuals who believe that they have a low risk of disease are more likely to take unhealthy actions, and individuals who consider themselves have a high risk of disease will be more likely to carry out behaviors to reduce their risk of disease (Onoruoiza, 2015).

A study by Yue et al. (2015) stated that vulnerability is associated with adherence to taking antihypertensive drugs (p = 0.017). Trisnawan's (2015) study stated that there is an association between perceived vulnerability and treatment-seeking behavior with p = 0.01.

Each individual has a different way of taking action for healing or prevention to overcome health problems. All depends on the belief of each individual whether he wants to access existing health services or not. Belief in question is related to cognitive such as knowledge of health problems and individual perceptions of the symptoms of the perceived disease (Sarafino, 2006).

Based on this, it can be concluded that there is a positive association between perceived vulnerability and hypertension prevention behavior, but the association is indirect or through the perceived threats. Thus the results of this study are in accordance with previous study and existing theories.

2. The association between perceived seriousness and hypertension prevention behavior through perceived threats

There is an indirect association between perceived seriousness and hypertension prevention behavior through variables between perceived threats.

This is in accordance with the study of Adawiyah (2014) which stated that there is a strong association between perceived seriousness and prevention of hypertension (b= 0.69; 0.001).

Perceived seriousness refers to subjective judgments on the severity of health problems and their potential consequences. The Health Belief Model proposes that individuals who feel serious health problems are given are more likely to behave to prevent problems (or reduce severity). The seriousness that is felt includes beliefs about the disease itself (eg whether it is life threatening or can cause disability or illness or not) and the wider impact of the disease on work and social roles (Onoruoiza, 2015).

Suhadi's study (2011) stated that there is a significant association between perceived seriousness about hypertension and adherence in the treatment of hypertension, this can be seen from p <0.05. This perceived seriousness is based on the actions of individuals to seek treatment and prevention of disease and is also driven by the seriousness of the disease by individuals.

Sholiha's study (2014) stated that the severity of the disease that is felt causes individuals to believe that the consequences of the severity are threats to their lives. Therefore, individuals will take action to seek treatment and prevention of disease.

Based on this, it can be concluded that there is a positive association between

the perceived seriousness and the hypertensionprevention behavior, but the association is indirect, or through the perceived threats. Thus, the results of this study are in accordance with previous study and existing theories.

3. The association between cues to action and hypertension prevention behavior through perceived threats as intervening variable

There is an indirect association between perception cues to action and hypertension prevention behavior through variables between perceived threats.

A study by Yue et al. (2015) stated that cues to action or gestures are related to adherence to taking antihypertensive drugs (p= 0.034). Reading about disease information, knowing about services, and consulting with other people about illnesses can lead to adherence.

A cue to action is needed to encourage individual involvement in health behavior. Cues to action can come from internal or external. Physiological cues (eg; pain, symptoms) are examples of internal cues for action. External cues include events or information from other close people, such as the media or health care providers.

Based on those, it can be concluded that there is a positive association between cues to action and hypertension prevention behavior, but the associationis indirect or through perceived threats. Thus, the results of this study are in accordance with previous study and existing theories.

4. The association between perceived threats and hypertension prevention behavior

There is a direct association between perceived threat and hypertension prevention behavior.

Suhadi'sstudy (2011) stated that there is anassociationbetween perceived perceptions and adherence of the elderly in trea-ting hypertension (p <0.05). When the threat increases, preventive behavior will occur against the disease.

Based on this, it can be concluded that there is a positive association between perceived threat and hypertension prevention behavior. The associationis direct. Thus, the results are in accordance with previous study and existing theories.

5. The association between perceived benefits and hypertension prevention behavior

There is a direct and significant association between perceived benefits and hypertension prevention behavior.

A study from Adawiyah (2014) concluded that there is an association between perceived benefits and prevention behavior for hypertension (r= 0.49; p= 0.003).

The perceived benefits refer to an individual's assessment of the value or efficacy of behaving to reduce the risk of disease. If an individual believes that certain actions will reduce vulnerability to health problems or reduce his seriousness, then he tends to engage in behaviors that are detached from objective facts about the effectiveness of actions (Onoruoiza, 2015).

Purwono's study (2014) stated that there is a significant association between perceived benefit factors and commitment to tertiary hypertension prevention (OR= 7.05; p= 0.001). The benefits of actions directly motivate behavior and indirectly determine the activity plan to achieve benefits as a result.

The perceived benefits can be influenced by several factors. One of these factors is the possibility that individuals do not tend to spend their time and assets in activities to get positive results.

Based on the results of the study it can be concluded that there is a positive association between perceived benefits and hypertension prevention behavior. Thus,

the results are in accordance with previous study and existing theories.

6. The association between perceived barrier and hypertension prevention behavior

There is a direct association between perceived barrier and hypertension prevention behavior.

A study from Adawiyah (2014) concluded that there is a significant association between perceived barrier and efforts to prevent hypertension (r= 0.46; p= 0.005).

According to Rosenstock (1988), in accordance with the theory of Health Belief Model someone will take medication or prevention if they feel a greater threat. Similarly, high perceived seriousness about hypertension will make a person take precautionary measures or early detection of the disease.

Perceivedbarrier is an individual's view on how much the barrier is to adopt or take the suggested action. An action may not be taken by someone, even though the individual believes in the benefits of taking such action. This can be caused by barrier.

Barrier refers to the characteristics ofprevention measurementsuch as troublesome, expensive, unpleasant or even painful. These characteristics can cause individuals to avoid or move away from the desired action to be carried out. The perceived barrier in taking action is perceived discomfort, burden, danger (e.g., side effects of medical procedures) and discomfort (e.g., pain, anger) involved in engaging in behavior (Onoruoiza, 2015).

Trisnawan'sstudy (2015) stated that there is anassociation between perceived barrier and treatment-seeking (p= 0.060).

A study by Kurniawati and Sulistyowati (2014) showed that perceived barrier affects actions in preventing pathological vaginal discharge (p= 0.0001; OR= 0.06). This is also in accordance with Purwono's

study (2014) which stated that there is a significant association between perceived barrier factors and commitment to tertiary hypertension prevention (OR= 6.60; p= 0.001).

Based on this, it can be concluded that there is a negative association between perceived barrier and hypertension prevention behavior, the association is direct. Thus the results are in accordance with previous study and existing theories.

7. The association between self-efficacy and hypertension prevention behavior

There is a direct association between self-efficacy and hypertension prevention behavior of.

A study by Padula and Sullivan (2006) in Robinson (2012) found that self-efficacy is a strong predictor of health promotion behavior.

A study by Yue et al. (2015) stated that self-efficacy is associated to adherence to taking anti-hypertensive drugs (p= 0.002). Mulyatiet al., (2013) study stated that there is anassociation between self-efficacy and Self Management Behavior in patients with hypertention (OR= 3.67; p= 0.003).

Skinneret's al., (2000) study identified two dimensions of belief in effective therapy to improve the success of hypertension treatment, namely the belief that therapy can control hypertension and the belief that therapy can prevent complications from the disease. Self-confidence in self-ability (self-efficacy) can lead to increased self-motivation in making lifestyle changes in patients (Maes and Karoly, 2005).

Wakhida study (2016) stated that there is a positive association between self-efficacy towards the use of VCT in pregnant women (b= 0.52; p= 0.001). Self-efficacy refers to the confidence in the extent to which individuals estimate their ability to

carry out tasks or perform tasks that are needed to achieve a certain outcome. Beliefs in all these abilities include self-confidence, adaptability, cognitive capacity, intelligence and capacity to act in stressful situations.

Purwono'sstudy (2014) stated that there is a significant association between perceptions of self-ability and commitment to tertiary prevention of hypertension (OR= 6.60; p= 0.017).

Trust in one's ability to influence changes in outcomes (ie, self-efficacy) is a key component of health behavior change (Onoruoiza, 2015). Self-efficacy possessed by a person can be used to predict healthy behavior and can facilitate modification of one's behavior. People are more likely to adopt health behaviors if they think they will succeed in addopoting it. Self-efficacy is used as a mechanism for controlling chronic diseases and is used as a predictor of success in lifestyle changes. This is in line with the results of this study which shows that there is a direct association between self-efficacy and hypertension prevention behavior. Thus, the results are in accordance with previous study and existing theories.

Based on the study, it can be concluded that self-efficacy, perceived benefit, perceived barrier and perceived threat are directly associated to hypertension prevention behavior. While perceived vulnerability, perceived, and cues to action are indirectly relate to hypertension prevention behavior.

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