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Analysis Multilevel: Application of Health Belief Model on Tertiary Prevention Behavior in Kaur District, Bengkulu Province, Indonesia

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ABSTRACT

Background: Uncontrolled hypertension can cause complications, so efforts to prevent and control hypertension can be carried out by applying the Health Belief Model health promotion theory. This study aimed to determine the influence of the Health Belief Model construct on tertiary prevention behavior in hypertensive patients.
Subjects and Method: This was a cross-sectional study conducted in 16 health centers in Kaur district, Bengkulu, from November to December 2023. A total of 208 hypertension patients were selected by simple random sampling. The dependent variable is tertiary prevention behavior. Independent variables are a number of constructs in the Health Belief Model theory including perceived susceptibility, stimulus to act, and self-efficacy. Data collection was carried out using questionnaires and data were analyzed using a multilevel double linear regression analysis model.
Results: There was a positive association between perception of vulnerability (b= 0.11; CI 95%= -0.01 to 0.22; p= 0.065), signal to act (b= 0.20; CI 95%= 0.03 to 0.38; p= 0.022), self-efficacy (b= 0.16; CI 95%= -0.01 to 0.32; p= 0.059) on hypertension tertiary prevention behavior. Public health center have less contextual influence on tertiary prevention behavior in hypertensive patients (ICC= 6.68%).
Conclusion: Perception of vulnerability, cues to act, and self-efficacy are predictors of hypertension tertiary prevention behaviors.

Keywords: health belief model, hypertension, tertiary prevention behaviors.

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BACKGROUND

Cardiovascular disease is one of the major health problems in developed and developing countries. This disease is a challenge to public health because it often occurs without complaint and is usually known after complications occur. One of the most common cardiovascular diseases is hypertension, which is systolic blood pressure >140 mmHg and diastolic blood pressure

>90 mmHg (Sukohar, 2021). Uncontrolled hypertension can lead to complications such as heart failure, kidney failure, stroke, angina and memory loss. The worst complication of hypertension is damage to the arteries that cause blood vessels to narrow so that the heart is required to work harder to pump blood throughout the body (Dukunde et al., 2023).

Based on Basic Health Research (Riskesdas 2018), the prevalence of hypertension in Indonesia from the results of blood pressure measurements in the population aged ≥18 years is 34.1% with a total of 658,201 people. The province with the highest hypertension incidence rate is South Kalimantan province (44.13%) and the province with the lowest hypertension incidence rate is Papua (22.22%) (Ministry of Health of the Republic of Indonesia, 2019).

The number of hypertension patients in Bengkulu province has increased from year to year, in 2020 there were 74,326 patients with disabled hypertension who received health services, in 2021 there were 70,484 patients and for 2022 there was a very high increase of 168,519 patients who were recorded and received health services. The large number of patients who are found and receive services will certainly increase the quality of life of hypertensive patients, this can be seen from the number of people who receive health services, namely in 2020 as much as 22% but in 2021 it decreased by 19%, but in 2022 it increased by 64% (Bengkulu provincial health profile, 2022).

The report on the number of hypertension patients in Kaur district in 2020 was 7001 who were recorded and received health services, in 2021 there was a decrease of 3870 patients, but in 2022 it increased again, namely 5053 patients who were recorded and received health services (Kaur district health profile, 2022).

Hypertension can be prevented by controlling risky behaviors such as smoking, unhealthy diets such as insufficient consumption of vegetables and fruits as well as excessive consumption of sugar, salt and fat, obesity, lack of physical activity, excessive alcohol consumption and stress. Riskesdas 2018 data on the population aged 15 years and above obtained data on risk factors such as the proportion of people who do not eat vegetables and fruits by 95.5%, the proportion of lack of physical activity is 35.5%, the proportion of smoking is 29.3%, the proportion of central obesity is 31% and the proportion of general obesity is 21.8%. The data mentioned above shows an increase when compared to Riskesdas data in 2013 (P2PTM Ministry of Health of the Republic of Indonesia, 2019).

One of the government's efforts to improve the degree of public health is to build a health service center or health center. Public health center as a first-level health facility is very relevant in the application of the principles of public health services (PHC) to provide comprehensive services, namely promotive, preventive and curative programs to maximize individual independence in disease prevention and treatment (Anita et al., 2016).

Prevention of hypertension can also be done by applying the theory of health promotion. The Health Belief Model is one of the theoretical models of health behavior change that can be used to study and promote health based on a person's understanding that a person is able to take actions related to his health (Abraham and Sheeran, 2016). A person who has been diagnosed with hypertension can be prevented, namely tertiary prevention, which is an effort to prevent diseases towards various worse consequences by improving the quality of life. This tertiary prevention focuses on rehabilitation and recovery after

illness to minimize pain, disability, and improve quality of life (Triyanto, 2014).

Several studies have also stated that the Health Belief Model has a positive influence on hypertension prevention behavior (Puspita et al., 2017). In addition, the theory of the Health Belief Model also has an influence in improving adherence to antihypertensive treatment (Apriliani et al., 2022). Based on these problems, this study aimed to analyze and explain whether the theory of health belief model can affect tertiary prevention behavior in hypertensive patients.

SUBJECTS AND METHOD

1. Study Design

This study uses an observational analytical study with a cross sectional approach, namely a study that studies the distribution and prevalence of disease or assesses the relationship of an independent variable (exposure) to a dependent variable (disease) (Murti, 2018).

This research was conducted in November to December 2023. The location of this research is in 16 health centers in Kaur district, Bengkulu province.

2. Population and Sample

The population in this study were hypertensive patients in Kaur district, Bengkulu, Indonesia. The sample was selected using simple random sampling from 16 community health centers in Kaur district so that a sample of 208 hypertensive patients was selected.

3. Study Variables

The dependent variable is tertiary prevention behavior. The independent variables, namely the health belief model theory, include perception of vulnerability, stimulus to act and self-efficacy.

4. Operational Definition of Variables

Perceived susceptibility is a condition where a person has a belief/belief that he or she can get a disease. Data was measured using questionnaires. The scale used is continuous, and for the purpose of data analysis, it is changed to categorize.

Cues to action is a motivating factor for a person to make a change in behavior. Data was measured using questionnaires. The scale used is continuous, and for the purpose of data analysis, it is changed to be categorized.

Self-efficacy is an individual's belief or belief that they are capable of doing something. Data was measured using questionnaires. The scale used is continuous, and for the purpose of data analysis, it is changed to be categorized.

Tertiary prevention is an effort to prevent more serious complications or death with the aim of improving the patient's quality of life. Data was measured using questionnaires. The scale used is continuous, and for the purposes of data analysis, it is changed to be categorized.

5. Study Instruments

The research instruments used in the data collection of this research are:

a. Primary data collection: The instrument used is a questionnaire. The questionnaire is made based on existing theories and has been tested for validity and reliability.
b. Secondary data collection: The instruments used are data from related agencies such as the Health Office and the Health Center where the researcher conducts research.

6. Data analysis

Univariate analysis to obtain the frequency distribution and percentage of characteristics of the research subjects. Bivariate analysis to analyze the difference between independent and dependent variables used the chi-square test with a confidence level of 95% (p=0.05), and multivariate analysis

used a multilevel double linear regression analysis model.

7. Research Ethics

Ethical aspects in this research include informed consent, anonymity and confidentiality of data. Research ethical approval was obtained from the Health Research Ethics Committee of Dr. Moewardi Hospital, with the number of: 448/II/HREC/-2024.

RESULTS

1. Sample Characteristics

This research was conducted in November-December 2023 in Kaur Regency, Bengkulu Province, where Kaur Regency consists of 16 health centers spread across 15 sub-districts. This study was conducted on 208 hypertension patients representing each health center.

Based on table 1, age characteristics of research subjects, it was stated that 97 research subjects (46.63%) were under 54 years old, and 111 research subjects (53.37%) were over 54 years old. For educational characteristics, 114 research subjects (54.81%) were educated below high school/vocational school and below and 94 research subjects (45.19%) were educated in high school/vocational school and above. In terms of gender characteristics, 77 research subjects (37.02%) were male and 131 research subjects (62.98%) were female.

Table 1. Characteristics of research subjects

Characteristics	Category	Frequency (n)	Percentage (%)
Age	<54 years	97	46.63
	>54years	111	53.37
Education	<Senior high school	114	54.81
	>Senior high school	94	45.19
Sex	Male	77	37.02
	Female	131	62.98

2. Univariate analysis

The research results in table 1 show that the research subjects of hypertensive patients had a high perception of vulnerability, namely 136 subjects (65.38%). Judging from the stimulus to act, the research subjects had a fairly high stimulus to act, 120 subjects (57.69%) and had high self-efficacy, namely 149 subjects (71.63%). Then, in the context of efforts to carry out tertiary prevention in the subjects of this study, there were quite high prevention efforts of 120 subjects (57.69%).

Table 2. Frequency distribution of respondent characteristics (categorical data)

Characteristics	Category	Frequency (n)	Percentage (%)
Perceived Vulnerability	Low	72	34.62
	High	136	65.38
Stimulation of Action	Low	88	43.31
	High	120	57.69
Self-Efficacy	Low	59	28.37
	High	149	71.63
Tertiary Prevention	Low	88	43.31
	High	120	57.69

3. Bivariate analysis

Bivariate analysis explains the influence of independent variables on frontal variables. The independent variables in this study are perception of vulnerability, stimulus to act and self-efficacy, while the dependent variable in this study is tertiary prevention. The method used in this bivariate analysis is the chi-square test with a confidence level of 95% (p=0.05).

Table 3 show the results of the chi-square test, bivariate analysis of the influence of vulnerability perception on tertiary prevention behavior in hypertensive patients (OR= 0.56; CI 95%= 0.29 to 1.05; p=0.050). This shows that there is a significant influence between the perception of vulnerability and tertiary prevention behavior. Patients with low vulnerability had higher levels of tertiary preventive behavior than those with high susceptibility.

Table 3 showed the results of bivariate analysis on the effect of stimulus to act on tertiary prevention behavior in hypertensive patients (OR= 0.55; CI 95%= 0.30 to 1.01; p= 0.040). This shows that there is a significant influence between stimulus to act on tertiary prevention behavior. Patients with low stimulus had higher tertiary prevention behaviors than patients with high stimulus to act.

Table 3 also showed the effect of self-efficacy on tertiary prevention behavior in hypertensive patients (OR= 0.38; CI 95%= 0.20 to 0.69; p= 0.010). This shows that there is a significant influence between self-efficacy and tertiary prevention behavior. Patients with high self-efficacy had high tertiary prevention behaviors compared to patients with low self-efficacy.

Table 3. Bivariate analysis test results of the relationship between perceived vulnerability, stimulation of action, and self-efficacy with tertiary prevention behavior.

Variable	Tertiary prevention				OR	95%CI		p
	High		Low			Lower Limit	Upper Limit	
	n	%	n	%				
Perceived Vulerabilty								
Low	72	52.9	64	47.1	0.56	0.29	1.05	0.050
High	48	66.7	24	33.3				
Stimuluation of action								
Low	62	51.7	58	48.3	0.55	0.30	1.01	0.040
High	58	65.9	30	34.1				
Self-efficacy								
Low	48	46.2	56	53.8	0.38	0.20	0.69	0.010
High	72	69.2	32	30.8				

4. Multivariate analysis

Multivariate analysis describes variables that are independent of dependent variables. The independent variables were perception of vulnerability, stimulus to act, self-efficacy and the dependent variable was tertiary prevention behavior at level 1. Meanwhile, the health center is level 2.

Table 4 demonstrate the results of multilevel double linear regression analysis of the Application of the Health Belief Model in tertiary prevention behavior in hypertensive patients. The results of multilevel double linear regression analysis showed a positive and statistically close to significant relationship between vulnerabi-

lity perception and tertiary prevention behavior. Each increase of 1 unit of vulnerability perception score will be followed by an increase in the hypertension tertiary prevention behavior score of 0.11 units (b= 0.11; CI 95%= -0.01 to 0.22; p= 0.065).

The results of multilevel double linear regression analysis showed a positive and statistically significant relationship between action cues and tertiary prevention behaviors. Each increase of 1 unit of action signal score will be followed by an increase in the hypertension tertiary prevention behavior score of 0.20 units (b= 0.20; CI 95%= 0.03 to 0.38; p= 0.022).

The results of multilevel double linear regression analysis showed a positive and statistically close to significant relationship between self-efficacy and tertiary prebellious behavior. Each increase of 1 unit of self-efficacy score will be followed by an increase in the hypertension tertiary prevention behavior score of 0.16 units (b= 0.16; CI 95%= -0.01 to 0.32; p= 0.059).

The results of multilevel double linear regression analysis showed that the contextual influence of the health center on the tertiary prevention behavior of hypertensive patients was low (ICC= 6.68% <8-10%). This shows that the health center has less influence in terms of tertiary prevention behavior in hypertensive patients.

Table 5. Results of multilevel multiple linear regression analysis

Independent Variable	Coefficient (b)	CI 95%		p
		Lower Limit	Upper Limit	
Fixed Effect				
Perception of Vulnerability	0.11	- 0.01	0.22	0.065
Stimulation of action	0.20	0.03	0.38	0.022
Self-efficacy	0.16	- 0.01	0.32	0.059
Random Effect				
Community health center				
Var (constanta)	0.25	0.05	1.08	
N Observasi= 208				
N Community health center= 16				
Log likelihood=-216.76				
LR test vs Linear Regression= 3.84				
ICC= 6.68 %				

DISCUSSION

Effect of vulnerability on tertiary prevention

The results of multilevel double linear regression analysis showed a positive and statistically close to significant relationship between vulnerability perception and tertiary prevention behavior. Every 1 unit increase in vulnerability perception score will be followed by an increase in hypertension tertiary prevention behavior score by 0.11 units.

The results of this study are also supported by the research of Setiyaningsih et al. (2016) which states that there is a positive relationship between susceptibility to hypertension prevention behavior. Each individual will have their own perspective in assessing their health level, if the individual feels at risk of a disease, the possibility of prevention will be higher.

Research results of Yue et al. (2015), stated that there is a significant relationship between vulnerability and antihypertensive

treatment compliance. The belief that the perceived vulnerability to disease risk will enable the individual to have high adherence to his or her treatment.

Effect of Action Signals on tertiary prevention behavior

The results of multilevel double linear regression analysis showed a positive and statistically significant relationship between action cues and tertiary prevention behaviors. Each 1-unit increase in the action signal score will be followed by an increase in the hypertension tertiary prevention behavior score by 0.20 units.

The results of this study are supported by the research of Yue et al. (2015), showed that there is a significant relationship between action cues and hypertension treatment adherence. The belief that an individual has about the risk of a disease will encourage the individual to take health behavioral actions and encourage treatment.

The results of the research of Yanti et al. (2020), stated that the significance of the action cues towards the self-care of hypertensive patients. Individuals tend to increase vigilance and activate health behaviors when the individual has held trust. Action cues can come from internally or within oneself such as physiological cues and can also be obtained from the external.

Effect of Self-Efficacy on Tertiary Prevention Behavior

The results of multilevel double linear regression analysis showed a positive and statistically close to significant relationship between self-efficacy and tertiary prebellious behavior. Every 1 unit increase in self-efficacy score will be followed by an increase in hypertension tertiary prevention behavior score of 0.16 units.

The results of this study, supported by Ma's (2018) research, show that there is a significant relationship between self-efficacy and self-care behavior of young adults and the elderly of hypertensive patients. Self-care behavior plays an important role in hypertension management, where self-care is an action directed by oneself or the environment for the sake of life and well-being. The main domains of hypertension self-care behavior include regular consumption of medications and modifying live crocodiles.

The results of the research of Puspita et al. (2017), showed that there was a positive relationship between self-efficacy and hypertension prevention behavior. Increased health awareness is the main key in hypertension prevention behavior. Basically, prevention efforts can be made as early as possible before the onset of disease symptoms by reducing, reducing, and controlling risk factors for hypertension.

The contextual influence of health centers on tertiary prevention behavior

The results of the multilevel analysis showed that the ICC value= 6.68% <8-10%, the indicator showed that the contextual influence of the health center on the tertiary preventive behavior of hypertensive patients was low. Each individual has a different way of taking action to cure a perceived health disorder. It all depends on the trust that the individual has, so that it is also the basis for the individual to use the access to health services that have been provided.

Public health center has development duties and responsibilities that are oriented to public health. Public health center must implement public health center managers in carrying out their duties and functions in implementing health policies, this aims to increase people who care about the importance of health. The task of the health center is carried out by organizing UKBM (Anita et al., 2016).

AUTHOR CONTRIBUTION

All authors have contributed significantly in analyzing existing data, as well as actively participating in preparing the final manuscript of the research results.

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CONFLICT OF INTEREST

There is no conflict of interest in this study.

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REFERENCES

Anita B, Febriawati H and Yandrizal Y (2016), The role of public health centers (puskesmas) as the gatekeeper of national health insurance, J Kesmas, 12(1): 76–89, doi: 10.15294/ kemas.-v12i1.3933.

Apriliani ED, Prasetya H, Murti B (2022), Meta-analysis: Application of health belief model on the adherence to antihypertensive medication, J Health Promot. Behav. 7(3): 238–249, doi: 10.26911/ thejhpb. 2022.07.03.06.

Bhattacharya S, Varshney S, Hossain MM, Saleem, SM, Gupta P, Singh A (2023). Taste modification strategy for prevention and control of hypertension in India: need for robust clinical trials, Lancet Reg Health, 14(5): 100-206, doi: 10.1016/j.lansea.2023.100206.

Dinkes Kabupaten Kaur (2021). Profil Kesehatan Kabupaten Kaur Tahun 2020 (Kaur Regency Health Profile in 2020). Bintuhan: Dinas Kesehatan Kabupaten Kaur.

Dinkes Kabupaten Kaur (2022). Profil Kesehatan Kabupaten Kaur Tahun 2021 (Kaur Regency Health Profile in 2021). Bintuhan: Dinas Kesehatan Kabupaten Kaur.

Dinkes Kabupaten Kaur (2023). Profil Kesehatan Kabupaten Kaur Tahun 2022 (Kaur Regency Health Profile in 2022). Bintuhan: Dinas Kesehatan Kabupaten Kaur.

Dinkes Provinsi Bengkulu (2021). Profil Kesehatan Provinsi Bengkulu Kaur Tahun 2020. Bengkulu: Dinas Kesehatan Provinsi Bengkulu.

Dinkes Provinsi Bengkulu (2022). Profil Kesehatan Provinsi Bengkulu Kaur Tahun 2021 (Bengkulu Kaur Province Health Profile in 2021). Bengkulu: Dinas Kesehatan Provinsi Bengkulu.

Dinkes Provinsi Bengkulu (2023). Profil Kesehatan Provinsi Bengkulu Kaur Tahun 2022. Bengkulu: Dinas Kesehatan Provinsi Bengkulu.

Dukunde A, Ntaganda JM, Kasozi J, Nzabanita J (2023). Prediction of the prevalence of hypertension and associated risk factors in rwanda using gibbs sampling method, diseases, 11(2): 87, doi: 10.3390/ diseases110-20087.

Istiana D, Purqoti DNS, Musmuliadin M, Rispawati BH, Romadhonika F, Dingle K (2022). The relationship between physical activity and the incidence of hypertension at the work area of the ampenan health center, strada J Ilmiah Kesehatan, 11(1): 45–50, doi: 10.30994/sjik.v11i1.884.

Kementrian Kesehatan Republik Indonesia (2019). Laporan nasioanal riskesdas 2018 (National riskesdas report 2018). Lembaga penerbit Badan Penelitian dan Pengembangan Kesehatan.

Kementrian Kesehatan Republik Indonesia (2019). P2PTM Lembaga penerbit Badan Penelitian dan Pengembangan Kesehatan (P2PTM Issuing institution of the Health Research and Develop-

ment Agency).

Ma C (2018). An investigation of factors influencing self-care behaviors in young and middle-aged adults with hypertension based on a health belief model, Heart and Lung, Elsevier Inc. 47 (2): 136-141, doi: 10.1016 /j.hrtlng. 2017. 12.001.

Murti B (2018). Desain dan ukuran sampel untuk penelitian kuantitatif dan kualitatif dibidang kesehatan (Design and sample size for quantitative and qualitative research in the health sector). Yogyakarta : Gajah mada Universitas Pres.

Puspita RC, Tamtomo D, Indarto D (2017), Health belief model for the analysis of factors affecting hypertension preventive behavior among adolescents in Surakarta, J Health Promotion Behavior, 2(2): 183–196, doi: 10.26911/ thejhpb .2017.02.02.08.

Setiyaningsih R, Tamtomo D, Suryani N (2016). Health belief model: determinant sofhypertension prevention behaviorinadults at community health center, Sukoharjo, Centraljava, J Health Promot. Behav, 1(3): 160-170, Doi:10.26911/thejhpb. 2016.01.03.03.

Sukohar A (2021). Health belief model and hypertension prevention, Indian. J Forensic Med Toxicol 15(3): 2054–2059, doi:10.37506/ ijfmt.v15i3.15-619.

Triyanto E (2014), Pelayanan keperawatan bagi penderita hipertensi secara terpadu (Nursing services for hypertension patients). Graha ilmu. Yogyakarta

Yanti DE, Perdana AA. Rina NO (2020), Health Belief Model: Selfcare Penderita Hipertensi di Wilayah Kerja UPT Puskesmas Kalirejo Kabupaten Pesawaran, J Kesmas, 9 (2): 192–205, doi: 10.33024/jdk.v9i2.2956.

Yue Z, Li C, Weilin Q and Bin W (2015), Application of the health belief model to improve the understanding of antihypertensive medication adherence among Chinese patients, Patient Education and Counseling, Elsevier Ireland Ltd, 98(5): 669–673, Doi:10.-1016/j.pec.2015.02.007.