

## Does the Integrated Health Post have Contextual Effect on Tertiary Preventive Behavior among Hypertensive Patients? A Multilevel Analysis Evidence from Surakarta

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### ABSTRACT

**Background:** The Indonesian Ministry of Health has launched a community-based non-communicable disease (PTM) control program through the non-communicable disease Integrated Development Post (Posbindu PTM). One of the non-communicable disease which is a very serious health problem is hypertension which is called the silent killer. The purpose of this study was to analyze the contextual effect of integrated development posts on the tertiary prevention behavior of patients with hypertension using Theory of Planned Behavior.

**Subjects and Method:** A cross sectional study was conducted at 25 integrated health post in Surakarta, from September to October 2019. A sample of 200 hipertensive patients was selected by stratified random sampling. The dependent variable was tertiary prevention behavior. The independent variables were education, attitude, subjective norm, perceived behavior control, intention, cadre support, and peer support. The data were collected by questionnaire and analyzed by multiple logistic regression run on Stata 13.

**Results:** Tertiary prevention behavior in patients with hypertension increased with education level  $\geq$ Senior high school ( $b= 1.22$ ; 95% CI= 0.37 to 2.08;  $p= 0.005$ ), positive attitude ( $b= 1.51$ ; 95% CI= 0.54 to 2.48;  $p= 0.002$ ), supportive subjective norm ( $b= 1.38$ ; 95% CI= 0.46 to 2.29;  $p= 0.003$ ), strong perceived behavioral control ( $b= 1.10$ ; 95% CI= 0.17 to 2.03;  $p= 0.020$ ), strong intention ( $b= 0.97$ ; 95% CI= 0.13 to 1.82;  $p= 0.023$ ), strong integrated development post cadre support ( $b= 1.57$ ; 95% CI= 0.69 to 2.46;  $p<0.001$ ), and strong peer support ( $b= 1.46$ ; CI 95% = 0.57 to 2.35;  $p = 0.001$ ). Integrated development post had a contextual effect on tertiary prevention behavior of hypertension with intra-class correlation (ICC)= 16.03%

**Conclusion:** Education, attitude, subjective norm, perceived behavior control, intention, cadre support, and peer support increased tertiary prevention behavior of hypertension.

**Keywords:** Tertiary prevention of hypertension, Theory of Planned Behavior

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### BACKGROUND

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Efforts to prevent and control non-communicable diseases need to be of mutual concern. In 2013, Indonesian Ministry of Health launched a community-based non-communicable diseases control program through a non-communicable diseases integrated development post. A non-commu-

nicable diseases integrated development post is a form of community empowerment activities under the supervision of community health center in an effort to control risk factors independently and continuously, with the aim that the community can carry out non-communicable diseases early de-

tection activities (Ministry of Health of Republic of Indonesia, 2012b).

A non-communicable diseases which becomes a very serious health problem is hypertension, it is also called the silent killer because it is a deadly disease that is not accompanied with symptoms first as a warning for sufferers (Fuadah and Rahayu, 2018).

It is estimated that 1 in 4 adults suffer from hypertension. If the disease is not controlled, it will target target organs and can cause heart attacks, strokes, kidney disorders, and blindness. Based on several studies reported that uncontrolled hypertension can cause a 7 times greater chance of having a stroke, 6 times more likely to have congestive heart failure, and 3 times more likely to have a heart attack. (Rahajeng and Tuminah, 2007).

The Indonesian Ministry of Health (2013) notes that hypertension is the cause of death number 3 after strokes and tuberculosis, reaching 6.7% of the population of all ages in Indonesia. The prevalence of hypertension in Indonesia which is obtained through measurements at the age of  $\geq 18$  years is 25.8%. Health workforce coverage is only 36.8%, most (63.2%) cases of hypertension in the community are undiagnosed. Data obtained from the Health Office of Central Java Province (2017) in Surakarta in the prevalence of hypertension in 2017 was 24.2%, an increase of 13.6% in 2018, with a hypertension prevalence of 37.8%.

Health centers as primary health care facilities need to do primary prevention, namely activities to stop or reduce the risk factors for hypertension before hypertension occurs. Community health center also need to do secondary prevention aimed more at early detection activities to find disease. While tertiary prevention is focused on efforts to maintain the quality of

life of sufferers. The aim is to prevent disability, control blood pressure, minimize complications and return patients into healthy status (Ministry of Health Republic of Indonesia, 2012a).

One theory that is commonly used to predict risk factors that affect a person's behavior is Theory of Planned Behavior (TPB). This theory stated that a person's behavior is affected by behavioral intentions that are determined by attitudes, subjective norms and perceived behavioral control (Barmpagianni et al., 2014). It is recognized that TPB is related to individual motivation as a determinant of the possibility of certain behaviors. In many studies, this theory has been successfully used to predict and explain various health-related behaviors (Nur et al., 2017).

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## SUBJECTS AND METHOD

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### 1. Study Design

The design of this study used observational analytic with cross-sectional approach. The study was conducted at 25 integrated development post in Surakarta in September-October 2019.

### 2. Population and Sample

The population in the subject of this study were patients with hypertension who participated in integrated service post activities. A sample of 200 hipertensive patients was selected randomly.

### 3. Study Variables

The dependent variable was tertiary prevention behavior of hypertension. The independent variables were education, attitude, subjective norm, perceived behavior control, intention, integrated development post cadre support, and peer support.

### 4. Operational Definition of Variables

**The tertiary prevention behavior of hypertension** was an individual effort to maintain quality of life. The data were collected by questionnaire. The measure-

ment scale was continuous, and transformed into dichotomous, coded 1 for yes and 0 for no.

**Education** was the highest level of formal education raised by the study subjects. The data were measured by questionnaire. The measurement scale was categorical, coded 1 for  $\geq$ Senior High School and 0 for  $<$ Senior High School.

**Attitude** was the response of individuals in a positive or negative assessment related to the ease or obstacles to influence individuals in preventing tertiary hypertension. The data were measured by questionnaire. The measurement scale was continuous, and transformed into dichotomous, coded 1 for positive and 0 for negative.

**Subjective Norm** was a belief about the support felt by individuals from social environment or people who have effect in their decisions to prevent tertiary hypertension. The data were measured by questionnaire. The measurement scale was continuous, and transformed into dichotomous, coded 1 for supportive and 0 for unsupportive.

**Perceived Behavioral Control** was an individual's belief in tertiary prevention of hypertension. The data were measured by questionnaire. The measurement scale was continuous, and transformed into dichotomous, coded 1 for strong and 0 for weak.

**Intention** was the existence of strong or weak desires of individuals to carry out tertiary prevention behaviors of hypertension. The data were measured by questionnaire. The measurement scale was continuous, and transformed into dichotomous, coded 1 for strong and 0 for weak.

**Integrated development post** was the support and motivation of integrated development post cadres in preventing non-communicable disease. The data were measured by questionnaire. Measurement scale

was continuous and transformed into dichotomous, coded 1 for strong and 0 for weak.

**Peer support** was the support provided by people who had a same age range or level of maturity in conducting tertiary prevention behavior of hypertension. The data were measured by questionnaire. Measurement scale was continuous and transformed into dichotomous, coded 1 for strong and 0 for weak.

## 5. Data Analysis

Univariate analysis explained the general description of data of the study, it was carried out on each of the variables of the study. The data were described in frequency (n) and percentage (%).

Bivariate analysis was conducted by Chi-square statistical test and calculation of odds ratio (OR) with a confidence interval (CI) of 95%.

Multivariate analysis was used to examine the effects of independent variables on dependent variable. It was conducted by a multilevel multiple logistic regression.

## 6. Research Ethics

This study was conducted based on research ethics, namely informed consent, anonymity, confidentiality, and ethical eligibility. Ethics permission in this study was obtained from the Health Research Ethics Commission Dr. Moewardi, Surakarta, Indonesia, No. 1.067/IX/HREC/2019.

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## RESULTS

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### 1. Univariate Analysis

The description of the study variables was univariate distribution of subjects of the study based on each study variable.

Table 1 shows that hypertensive patients aged  $<49$  years were 55 (27.5%), while those aged  $\geq 49$  years were 145 (72.5%), patients who did not take precautions were 115 (57.5%), while patients who took prevention were 85 (42.5%).

**Table 1. Sample Characteristics of categorical data**

Variables	Frequency (n)	Percentage (%)
<b>Age</b>		
<49 years	55	27.5
≥49 years	145	72.5
<b>Behavioral Prevention</b>		
Yes	115	57.5
No	85	42.5
<b>Education</b>		
<Senior High School	112	56.0
≥Senior High School	88	44.0
<b>Attitude</b>		
Negative	68	34.0
Positive	132	66.0
<b>Subjective Norm</b>		
Supportive	71	35.5
Unsupportive	129	64.5
<b>Perceived Behavior Control</b>		
Weak	81	40.5
Strong	119	59.5
<b>Intention</b>		
Weak	108	54.0
Strong	92	46.0
<b>Cadre Support</b>		
Weak	118	59.0
Strong	82	41.0
<b>Peer Support</b>		
Weak	92	46.0
Strong	108	54.0

Patients who were educated <senior high school were 112 (56.0%), those who were educated ≥Senior High School were 88 (44.0%), patients with negative attitude were 68 (34.0%), while patients with positive attitude was 132 (66.0%), patients with subjective norm that did not support as many as 71 (35.5%), whereas patients with subjective norms that support as many as 129 (64.5%), patients with weak PBC were 81 (40.5%), while patients with strong PBC are 119 (59.5%), patients with weak intention were 108 (54.0%), while patients with strong intention were 92 (46.0%), patients with weak integrated development post cadre support were 118 (59.0%), while patients with integrated development post cadre support strong were 82 (41.0%), 92%

(46.0%) had weak peer support, while 108 (54.0%) had strong peer support.

## 2. Bivariate Analysis

Bivariate analysis explained the effects of education, attitude, subjective norm, perceived behavior control, intention, and peer support on tertiary prevention behavior. Bivariate analysis was carried out by Chi-square test.

Table 2 shows that patients with education ≥Senior high school (OR= 4.14;  $p < 0.001$ ), positive attitude (OR= 5.77;  $p < 0.001$ ), supportive subjective norm (OR= 2.86;  $p < 0.001$ ), strong perceived behavior control (OR= 3.01;  $p < 0.001$ ), strong intention (OR= 2.95;  $p < 0.001$ ), strong cadre support (OR= 5.97;  $p < 0.001$ ), and strong peer support (OR= 3.67;  $p < 0.001$ ) incre-

ased tertiary hypertension prevention behavior.

**Table 2. Bivariate analysis of independent variables on the tertiary prevention behavior of patients with hypertension.**

Independent Variables	Tertiary Prevention Behavior of Hypertension				OR	p
	Yes		No			
	n	%	n	%		
<b>Education</b>						
<Senior High School	31	27.7	81	72.3	4.14	<0.001
≥Senior High School	54	61.4	34	38.6		
<b>Attitude</b>						
Negative	12	17.7	56	82.3	5.77	<0.001
Positive	73	55.3	59	44.7		
<b>Subjective Norms</b>						
Not Support	19	26.8	52	73.2	2.86	<0.001
Support	66	51.2	63	48.8		
<b>Perceived Behavioral Control</b>						
Negative	22	27.2	59	72.8	3.01	<0.001
Positive	63	52.9	56	47.1		
<b>Intention</b>						
Weak	33	30.6	75	69.4	2.95	<0.001
Strong	52	56.5	40	43.5		
<b>Cadre Support</b>						
Weak	30	25.4	88	74.6	5.97	<0.001
Strong	55	67.1	27	32.9		
<b>Peer Support</b>						
Weak	24	26.1	68	73.9	3.67	<0.001
Strong	61	56.5	47	43.5		

### 3. Multivariate Analysis

Multivariate analysis was conducted by a multilevel multiple logistic regression run on Stata 13.

Table 3 showed multilevel multiple logistic regression analysis on the determinants of tertiary prevention behavior in hypertensive patients.

Table 3 showed that patients with education ≥Senior high school had the likelihood to carry out tertiary prevention behavior 1.22 units higher than those with education <Senior high school (b= 1.22; 95% CI= 0.37 to 2.08; p= 0.005).

There was a positive effect of attitude on tertiary prevention behavior. Positive attitude increased tertiary prevention behavior (b= 1.51; 95% CI= 0.54 to 2.48; p = 0.002).

There was a positive effect of subjective norm on tertiary prevention behavior. Supportive subjective norm increased tertiary prevention behavior (b= 1.38; 95% CI= 0.46 to 2.29; p= 0.003).

There was a positive effect of perceived behavior control on the tertiary prevention behavior. Strong perceived behavioral control increased tertiary prevention behavior (b= 1.10; 95% CI= 0.17 to 2.03; p= 0.020).

There was a positive effect of intention on the tertiary prevention behavior. Strong intention increased tertiary prevention behavior (b= 0.97; 95% CI= 0.13 to 1.82; p= 0.023).

There was a positive effect of cadre support on the tertiary prevention behavior. Strong cadre support increased tertiary

ary prevention behavior (b= 1.57; 95% CI= 0.69 to 2.46; p <0.001).

There was a positive effect of peer support on the tertiary prevention beha-

avior. Strong peer support increased tertiary prevention behavior (b= 1.46; 95% CI= 0.57 to 2.35; p= 0.001).

**Table 3. Multilevel multiple logistic regression analysis on the determinants of tertiary prevention behavior in hypertensive patients**

Independent Variables	b	95% CI		p
		Lower Limit	Upper Limit	
<b>Fixed effect</b>				
Education (≥Senior high school)	1.22	0.37	2.08	0.005
Attitude (positive)	1.51	0.54	2.48	0.002
Subjective norms (supportive)	1.38	0.46	2.29	0.003
Perceived behavioral control (strong)	1.10	0.17	2.03	0.020
Intention (strong)	0.97	0.13	1.82	0.023
Cadre support (strong)	1.57	0.69	2.46	<0.001
Peer Support (strong)	1.46	0.57	2.35	0.001
<b>Random effect</b>				
Integrated health post (constant)	0.62	0.10	3.72	
Log likelihood= -82.83				
LR test vs. logistic regression, p= 0.050				
ICC= 16.03%				

## DISCUSSION

### 1. The effect of education on tertiary prevention behavior of hypertension.

The results of this study indicate that education had an effect on the tertiary prevention behavior of patients with hypertension. Patients who had education level ≥Senior High School had the possibility to carry out tertiary prevention as much as 1.22 units higher than patients who had education level ≤Senior High School.

Wahyuni and Eksanoto (2010) stated that there is an influence of education level on the incidence of hypertension. The higher a person's education, the easier they will receive information. In the end, the more knowledge he has. Conversely, if someone's level of education is low, it will hinder the development of one's attitude towards acceptance, information and values that are just introduced.

This study is supported by study conducted by Anggara and Prayitno (2013) which stated that hypertension tends to be

high in low education and decreases in accordance with improved education. This correlation is not solely due to differences in educational levels, but the level of education affects the healthy lifestyle by not smoking, not drinking alcohol, and exercising more frequently.

### 2. The effect of attitude on tertiary prevention behavior of hypertension.

The results of this study indicate that attitude has an influence on the tertiary prevention behavior of patients with hypertension. Patients with positive attitudes were 1.51 units higher in tertiary prevention than patients with negative attitudes

Cornelio et al. (2012) stated that there is an effect of a positive attitude to improve hypertension prevention behavior. Attitude is a person's closed response to a particular stimulus or object that involves the opinion and emotion factors in question.

A more positive attitude increases lower confidence to avoid behavior that results in high blood pressure. Patients with

hypertension, in controlling blood pressure need to make several efforts such as controlling hypertension risk foods such as salted fish (high salt), high fat (offal, fried food) which are considered to be causes of increased or high blood pressure (Collins et al., 2011).

Knowledge and attitude of patients with hypertension affect blood pressure control compliance, morbidity and mortality rates for hypertension. Attitudes affect the adherence to the hypertension diet with blood pressure in patients with hypertension. This study also stated that attitude is part of the predisposing factors that influence the shape of a person's behavior (Tariqan et al., 2018).

### **3. The effect of subjective norms on tertiary prevention behavior of hypertension**

The results of this study indicate that subjective norms had an effect on the tertiary prevention behavior of patients with hypertension. Patients with supportive subjective norms had the possibility of tertiary prevention by 1.38 units higher than patients with negative subjective norm.

Wikamorys and Rochmach (2017) concluded that subjective norms have a significant effect on behavioral intentions. the influence of subjective norms is positive with a regression coefficient of 0.016. This means that subjective norms that are increasingly supportive will significantly increase the patient's intention to take an action.

We can form "binding normative beliefs" by being told or by concluding what others want us to do or what they will agree with or disagree with, and we can form "descriptive normative beliefs" based on actions observed or inferred from references social (Ajzen, 2016).

Delpia et al. (2016) stated that subjective norms contain beliefs about the social

pressures that individuals get and feel from the expectations of people who have a high enough effect on their lives. These expectations can come from parents, relatives/friends and teachers or lecturers. The higher the expectations of others who are considered important for his life, the higher the person's intention to engage in hypertensive prevention behavior.

According to Umayana and Cahyati (2015), a person's health behavior is determined by the presence or absence of support from the surrounding community. In addition to the support of community leaders, the support of religious leaders also has an effect in the community. Furthermore, these religious leaders can bridge between health program managers and the community.

### **4. The effect of perceived behavioral control on tertiary prevention behavior of hypertension**

The results of this study indicate that the perceived behavioral control had an effect on the tertiary prevention behavior of patients with hypertension. Patients with strong perceived behavioral control were 1.10 units higher in the possibility of tertiary prevention than patients who had weak perceived behavioral control.

A study by Mahmoodabad et al. (2019), stated that perceived behavioral control has a positive correlation. Perceived behavioral control reflect a person's beliefs about how easy/difficult it is to conduct that behavior, the prominent belief that underlies the formation of this concept is control beliefs. This belief is combined with the perceived strength of each control factor to facilitate/inhibit behavior to shape the perceived behavioral control as a whole (Peters and Templin, 2013).

Perceived behavioral control is the individual's perception of whether or not the individual is easy to conduct the beha-

avior and is assumed to be a reflection of the experience that has occurred and the obstacles that are anticipated (Lestariana, 2018).

#### **5. The effect of intention on tertiary prevention behavior of hypertension.**

The results of this study indicate that intention had an effect on the tertiary prevention behavior of patients with hypertension. Patients with strong intentions had a 0.97 higher chance of taking tertiary prevention than patients with weak intentions.

Joeliatin et al. (2016) stated that the stronger the intention of the individual, the higher the intention to perform a behavior. The intention to conduct behavior is a person's tendency to choose to do or not do something. The strength or weakness of this intention is determined by the extent to which the individual has a positive attitude to certain behaviors, and the extent to which he chooses to do the behavior. Intention can accurately predict various behavioral tendencies (Handarbeny and Mahmudiono, 2017).

Theory of Planned Behavior stated that the intention to perform a given behavior together with perceived control over it is the single best predictor for carrying out the behavior. Behavioral intentions result from rational choice processes and are the functions of attitude, subjective norms, and perceived behavioral control (Gorgievski et al., 2018).

#### **6. The effect of integrated health post on tertiary prevention behavior of hypertension.**

The results of this study indicate that the support of integrated development post cadres had an effect on the tertiary prevention behavior of patients with hypertension. Patients with strong integrated development post cadre support are 1.57 units more likely to carry out tertiary prevention

than patients with weak integrated development post cadre support.

This study was in line with Setiyarningsih and Ningsih (2019), which stated that subjects who have a high cadre role will have the opportunity of 5.10 times to conduct hypertension control behavior. The role of cadres in surveillance of diseases and health problems is to comprehend, listen, record to find symptoms and health problems, find, report and make simple prevention and treatment efforts.

Health counseling/promotion carried out by health cadres can help to educate and monitor patient treatment in order to achieve therapeutic results in accordance with expectations of changes in patient behavior, especially increased patient compliance during treatment, patient compliance is the main factor determining success of therapy, patient noncompliance becomes a serious problem faced by health workers (Fadhilla, 2019)

#### **7. The effect of peer support on tertiary prevention behavior of hypertension.**

The results of this study indicate that peer support had an effect on the tertiary prevention behavior of patients with hypertension. Patients with strong peer support were 1.46 units more likely to carry out tertiary prevention than patients with weak peer support.

This study was in line with a study by Horwitz et al. (2016) which stated that the correlation between emotional support from friends and psychological pressure affects a person's life. Respondents assess social support as part of the communication network and function of social ties that describe the quality of interpersonal relationships. Interpersonal relationships are considered as aspects of emotional satisfaction in an individual's life. Social support received can make individuals feel loved,



cared for, valued, confident, calm, and competent.

Krishnamoorthy et al. (2018) stated that peer support has a beneficial effect on patients with diabetes and hypertension. In this study, it is also found that the effect of peer support provides maximum benefits for patients with uncontrolled hypertension. Peer support can be given to patients with uncontrolled hypertension with a risk of serious complications.

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#### **AUTHOR CONTRIBUTION**

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Angga Ferdianto as the data, analyzed the data, and wrote the manuscript. Didik Tamtomo interpreted the results of data analysis and suggested the materials for discussion. Endang Sutisna Sulaeman formulated the research framework.

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#### **FUNDING AND SPONSORSHIP**

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There was no external fund.

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#### **CONFLICT OF INTEREST**

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There was no conflict of interest in this study.

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#### **ACKNOWLEDGEMENT**

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We would like to thank the 25 integrated health post in Surakarta, Central Java, who had helped us in conducting this study and who had participated and were willing to be the subjects of the study.

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