Factors Affecting the Uptake of Non Communicable Disease Screening Service: A Multiple Logistic Regression in Kapuas Hulu, West Kalimantan

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ABSTRACT

Background: A non-communicable disease is the leading cause of mortality in the world. It is also a serious threat to health in low- and middle-income countries. Prevention efforts can be carried out through early detection and monitoring the risk factors of non-communicable disease. This study aimed to determine the factors affecting the uptake of non-communicable disease screening at integrated guidance post in Kapuas Hulu, West Kalimantan.
Subjects and Method: This was a cross sectional study. This study was conducted in Kapuas Hulu, West Kalimantan from August to October 2019. There were 200 people as the sample of the study. They were selected by fixed disease sampling. The dependent variable was the uptake of non-communicable disease screening. The independent variables were subjective norm, health information exposure, family support, cadre support, healthy behavior, health status, attitude, intention, and type of integrated guidance post. The data were collected by using questionnaires. They were analyzed by a multiple logistic regression with Stata 13.
Results: The uptake of non-communicable disease screening increased with subjective norm that supported (OR=2.86; 95%CI=1.16 to 7.01; p=0.022), lots of health information exposure (OR= 2.64; 95%CI=1.08 to 6.46; p=0.033), strong family support (OR=3.06; 95%CI=1.28 to 7.33; p= 0.012), strong cadre support (OR=2.75; 95%CI=1.15 to 6.54; p=0.022), positive healthy behavior (OR= 2.82; 95%CI=1.20 to 6.60; p=0.017), health status of having non-communicable disease (OR= 3.47; 95% CI=1.15 to 10.48; p=0.027), positive attitude (OR=2.80; 95%CI=1.16 to 6.74; p= 0.021), strong intention (OR=3.25; 95%CI=1.37 to 7.71; p=0.007) and primary integrated guidance post (OR=4.62; 95%CI=1.85 to 11.52; p=0.001).
Conclusion: The uptake of non-communicable disease screening is affected by subjective norm, health information exposure, family support, cadre support, healthy behaviour, health status, attitude, intention, and type of integrated guidance post.

Keywords: the uptake of screening, non-communicable disease, integrated guidance post.

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BACKGROUND

A non-communicable disease is the leading cause of mortality in the world and also a serious threat to health in low- and middle-income countries (Collins et al., 2019; Jayanna et al., 2019; Ma et al., 2017 WHO, 2019; Yang et al., 2018). 40.5 million (71%) of 56.9 million worldwide deaths were caused by non-communicable diseases (NCDs). 62% of all causes of death in Southeast Asia were caused by non-communicable diseases (Bennett et al., 2018; WHO, 2018). The highest number of disease in Indonesia was stroke (10.9%), which was occurred in West Kalimantan. Stroke (9.8%) was the second highest number of disease after mental disorders. The highest number of disease in Kapuas

Hulu was Hypertension, which was 25.20% (Kapuas Hulu Regency Health Office, 2018; Ministry of Health RI, 2018)

An effective way to prevent non-communicable disease is by uptaking integrated guidance post for non-communicable disease. It is a form of community participation in conducting early detection, through screening, prevention, and control of the risk factors affecting non-communicable diseases (Riley et al., 2016). The risk factors affecting non-communicable disease are behavior, environment, and physiological diseases (Benziger et al., 2016; Borges et al., 2016). The risk factor control aims to prevent complication, prevent disability and premature death, and improve quality of life. The effective and efficient way to control non-communicable disease is by empowering and increasing community participation, political support from across sectors, uptaking critical human resources in the community (Baghirov et al., 2019; Ke et al., 2019; Murphy et al., 2018; Negi et al., 2016).

Kapuas Hulu is a disadvantaged area (President of the Republic of Indonesia, 2015). Kapuas Hulu consists of 282 villages and 105 villages or 37.23% of villages that actively carry out integrated guidance post activities. Besides, the achievement of Minimum Service Standards (MSS) for productive age health services has reached 12.79% of the 100% MSS target in 2018 (Kapuas Hulu Regency Health Office, 2018). The low achievement in the MSS is caused by the lack of promotion and support from cadres and health workers, lack of knowledge, understanding and empowerment (Gangane et al, 2015; Mahajan et al., 2019; Wagner et al., 2018; Yerramilli et al., 2015). Based on this explanation, the researcher wanted to know the factors affecting the uptake of non-communicable disease screening in Kapuas Hulu, West Kalimantan.

SUBJECTS AND METHOD

1. Study Design

This was a cross sectional study. This study was conducted in Kapuas Hulu, West Kalimantan from August to October 2019.

2. Population and Sample

There were 200 people as the sample of the study. They were selected by fixed disease sampling.

3. Study Variables

The dependent variable was the uptake of non-communicable disease screening. The independent variables were subjective norm, health information exposure, family support, cadre support, healthy behavior, health status, attitude, intention, and type of integrated guidance post.

4. Operational Definition of Variables

The uptake of non-communicable disease screening was the role of the community in carrying out early detection and monitoring the risk factors affecting non-communicable disease. The data were collected by questionnaire. The measurement scale was continous and transformed into dichotomous, coded 0 for did not uptake (score <11) and 1 for uptook (score ≥11).

Subjective norm was perceived social pressure to be involved or not involved in a behavior. The data were collected by questionnaire. The measurement scale was continous and transformed into dichotomous, coded 0 for did not support (score <9) and 1 for supported (≥9).

Health information exposure was the amount of health information received. The data were collected by questionnaire. The measurement scale was continous and transformed into dichotomous, coded 0 for

lack of information (score <8) and 1 for lots of information (≥8).

Family support the encouragement or motivation from the family members to use non-communicable screening. The data were collected by questionnaire. The measurement scale was continous and transformed into dichotomous, coded 0 for weak (score <13) and 1 for strong (score ≥13).

Support of health cadre was the encouragement or motivation from the health cadres to use non-communicable screening. The data were collected by questionnaire. The measurement scale was continous and transformed into dichotomous, coded 0 for weak (score <14) and 1 for strong (score ≥14).

Healthy behavior was problem related to efforts to maintain and improve their health. The data were collected by questionnaire. The measurement scale was continous and transformed into dichotomous, coded 0 for negative (score <25) and 1 for positive (≥25).

Health status was a condition of someone who had a disease or did not have non-communicable disease. The data were collected by questionnaire. The measurement scale was continous and transformed into dichotomous, coded 0 for not a sufferer of NCDs and 1 for a sufferer of NCDs.

Attitude was a person's tendency in responding the uptake of non-communicable disease screening. The data were collected by questionnaire. The measurement scale was continous and transformed into dichotomous, coded 0 for negative (score <9) and 1 for positive (≥9).

Intention was a person's psychological readiness to do a behavior in uptaking non-communicable disease screening. The data were collected by questionnaire. The measurement scale was continous and transformed into dichotomous, coded 0 for weak (score <11) and 1 for strong (≥11).

Type of integrated health post was a type of early detection, monitoring, and follow-up activities that could be carried out in the integrated guidance post. The data were collected by questionnaire. The measurement scale was continous and transformed into dichotomous, coded 0 for basic integrated health post and 1 for primary integrated health post.

5. Data Analysis

Univariate analysis was carried out to describe each of the variables studied in general, such as the uptake of non-communicable screening, subjective norm, health information exposure, family support, health cadre support, healthy behavior, health status, attitude, intention, and type of integrated guidance post.

Bivariate analysis was carried out to explain the effect of the independent variables (subjective norm, health information exposure, family support, health cadre support, healthy behavior, health status, attitude, intention, and type of integrated guidance post) on the dependent variable (the uptake of non-communicable disease screening).

Multivariate analysis used a multiple logistic regression to explain the effect of the independent variables (subjective norm, health information exposure, family support, health cadre support, healthy behavior, health status, attitude, intention, and type of integrated guidance post) on the dependent variable (the uptake of non-communicable disease screening).

6. Study Ethics

This study was conducted based on the study ethics which consisted of informed consent form, anonymity, confidentiality, and ethical clearance. Ethical clearance in this study came from the Health Research Ethics Committee of Dr. Moewardi Hospital, Surakarta, Indonesia, No: 1.036/ VIII/ HREC / 2019.

RESULTS

1. Sample Characteristics

Table 1 shows the description of the characteristics of the study subjects. The mean value of the uptake of non-communicable disease screening was 11.04. The mean value of subjective norm was 9.09. The mean value of health information was 8.30. The mean value of family support was 12.77. The mean value of cadre support was 13.63. The mean value of healthy behavior was 24.75. The mean value of attitude was 8.82. The mean value of intention was 10.90.

Table 1. Sample characteristics of continous data

Variable	N	Mean	SD	Min.	Max.
The uptake of NCD screening	200	11.04	1.83	5	12
Subjective norm	200	9.09	1.20	4	10
Health information exposure	200	8.30	1.48	4	10
Family support	200	12.77	2.50	6	16
Cadre support	200	13.63	2.11	8	16
Behavior	200	24.75	4.61	9	32
Attitude	200	8.82	1.47	4	10
Intention	200	10.90	1.60	4	12

2. Univariate Analysis

Based on the results of the univariate analysis in Table 2, the people who used integrated guidance post for non-communicable disease screening were 148 people (74%). There were 133 people (66.5%) with subjective norm that supported. There were 147 people (73.5%) who had a lot of health information exposure. There were 124 people (62%) with strong family support. There were 119 people (59.5%) with strong health cadre support. There were 120 people (60%) with positive healthy behavior. There were 150 people (75%) who did not experience NCDs, 126 people (63%) had positive attitude, 132 people (66%) had strong intention, and 104 people (52%) who used primary integrated guidance post.

Table 2. Sample characteristics of categorical data

Characteristic		n	%
The uptake of non-communicable disease service	No	52	26.0
	Yes	148	74.0
Subjective norm	Without support	67	33.5
	With support	133	66.5
Health information exposure	Lack exposure	53	26.5
	Lots of exposure	147	73.5
Family support	Weak	76	38.0
	Strong	124	62.0
Cadre support	Weak	81	40.5
	Strong	119	59.5
Healthy behavior	Negative	80	40.0
	Positive	120	60.0
Health status	Without NCDs	150	75.0
	With NCDs	50	25.0
Attitude	Negative	74	37.0
	Positive	126	63.0
Intention	Weak	68	34.0
	Strong	132	66.0
Type of non-communicable diseases service	Basic	96	48.0
	Primary	104	52.0

3. Bivariate Analysis

The result of the bivariate analysis in Table 3 shows that 106 people (79.7%) with subjective norm that supported were likely to use non-communicable disease screening 2.33 times higher than people with subjective norm that did not support (OR=2.33; p= 0.009).

Table 3. The result of Chi-square test on factors affecting the uptake of non-communicable disease screening.

Independent Variable	The uptake of NCDs service				Total		OR	(95%) CI		p
	No		Yes					Lower Limit	Upper Limit	
	n	%	n	%	N	%				
Subjective norm										
Without support (<9)	25	37.3	42	62.7	67	100	2.33	1.15	4.70	0.009
With support (≥ 9)	27	20.3	106	79.7	133	100				
Information exposure										
Less (<8)	25	47.2	28	52.8	53	100	3.96	1.89	8.28	<0.001
More (≥8)	27	18.4	120	81.6	147	100				
Family support										
Weak (<13)	32	42.1	44	57.9	76	100	3.78	1.85	7.74	<0.001
Strong (≥13)	20	16.1	104	83.9	124	100				
Cadre support										
Weak (<14)	32	39.5	49	60.5	81	100	3.23	1.59	6.58	<0.001
Strong (≥ 14)	20	16.8	99	83.2	119	100				
Healthy behavior										
Negative (<25)	34	42.5	46	57.5	80	100	4.18	2.04	8.68	<0.001
Positive (≥25)	18	15.0	102	85.0	120	100				
Health status										
Communicable disease	46	30.7	104	69.3	150	100	3.24	1.24	9.92	0.009
Non-communicable disease	6	12.0	44	88.0	50	100				
Attitude										
Negative (<9)	31	41.9	43	58.1	74	100	3.60	1.77	7.35	<0.001
Positive (≥ 9)	21	16.7	105	83.3	126	100				
Intention										
Weak (<11)	30	44.1	38	55.9	68	100	3.94	1.93	8.08	<0.001
Strong (≥ 11)	22	16.7	110	83.3	132	100				
Type of NCDs service										
Basic	35	36.5	61	63.5	96	100	2.93	1.44	6.09	0.001
Primary	17	16.3	87	83.7	104	100				

Table 3 shows that 120 people (81.6%) with a lot of health information exposure were likely to use non-communicable disease screening 3.96 times higher than people with lack of health information exposure (OR=3.96; p <0.001).

Table 3 shows that 104 people (83.9%) with strong family support were likely to use non-communicable disease screening 3.78 times higher than people with weak family support (OR=3.78; p <0.001).

Table 3 shows that 99 people (83.2%) with strong health cadre support were likely to use non-communicable disease screening 3.23 times higher than people with weak health cadres support (OR=3.23; p<0.001).

Table 3 shows that 102 people (85%) with positive healthy behavior were likely to use non-communicable disease screening 4.18 times higher than people with negative healthy behavior (OR=4.18; p<0.001).

Table 3 shows that 44 people (88%) with health status of having non-communicable disease were likely to use non-communicable disease screening 3.24 times higher than people with health status of not

having non-communicable disease (OR= 3.24; p= 0.009).

Table 3 shows that 105 people (83.3%) with positive attitude were likely to use non-communicable disease screening 3.60 times higher than people with negative attitude (OR= 3.60; p<0.001).

Table 3 shows that 110 people (83.3%) with strong intention were likely to use non-communicable disease screening 3.94 times higher than people with weak intention (OR=3.94; p<0.001).

Table 3 shows that 87 people (83.7%) did non-communicable disease screening in the primary integrated guidance post 3.60 times higher than people who did non-communicable disease screening in the basic integrated guidance post (OR=2.93; p= 0.001).

4. Multivariate analysis

The result of the multivariate analysis showed that the uptake of non-communicable disease screening was statistically significant. It increased with subjective norm that supported (OR= 2.86; 95% CI=1.16 to 7.01; p= 0.022), lots of health information exposure (OR= 2.64; 95% CI= 1.08 to 6.46; p= 0.033), strong family support (OR= 3.06; 95% CI= 1.28 to 7.33; p= 0.012), strong cadre support (OR= 2.75; 95% CI= 1.15 to 6.54; p= 0.022), positive healthy behavior (OR=2.82; 95% CI= 1.20 to 6.60; p= 0.017), had non-communicable disease (OR=3.47; 95% CI= 1.15 to 10.48; p= 0.027), positive attitude (OR= 2.80; 95% CI= 1.16 to 6.74; p= 0.021), strong intention (OR=3.25; 95% CI= 1.37 to 7.71; p=0.007), and primary integrated health post (OR=4.62; 95%CI= 1.85 to 11.52; p=0.001).

Table 4. The results of the multiple logistic regression analysis of the factors affecting the uptake of screening for non-communicable diseases.

Independent Variable	OR	95% CI		p
		Lower limit	Upper limit	
Subjective norm (with support)	2.86	1.16	7.01	0.022
Health information exposure (more)	2.64	1.08	6.46	0.033
Family support (strong)	3.06	1.28	7.33	0.012
Cadre support (strong)	2.75	1.15	6.54	0.022
Healthy behavior (positive)	2.82	1.20	6.60	0.017
Health status (had NCDs)	3.47	1.15	10.48	0.027
Attitude (positive)	2.80	1.16	6.74	0.021
Intention (strong)	3.25	1.37	7.71	0.007
Type of Integrated guidance post	4.62	1.85	11.52	0.001
N= 200				
Log likelihood= -71.09				
LR chi^2= 87.05				
Prob > chi2 <0.001				
Pseudo R^2= 37.9%				

DISCUSSION

1. The effect of subjective norm on the uptake of NCDs screening service

The result of this study supports the Theory of Planned Behaviour (TPB) found by Ajzen (1991) that subjective norm was a form of perceived social pressure to do or not to do it. The result of this study is in line with a study conducted by Wagner et al. (2019) that a trust in descriptive norm could affect intention to participate in conducting non-communicable disease screening. Trust at the community level can be identified as an important facilitator for effective participation; meanwhile, distrust will inhibit parti-

cipation (George et al., 2015). Norm in society is socio-cultural factor that will affect a person to do or not to do a behavior (Atika et al., 2018).

The uptake of non-communicable disease screening in the integrated guidance post for PTM cannot be separated from norm or social norm. Social norm is standard rule in a socio-cultural group that is determined by social or religious authority.

The conviction to behave that was not contrary to social and religious values would lead to subjective norm that supported. Subjective norm that supported would affect intention. Strong intention would affect behavior to participate or use non-communicable disease screening.

2. The effect of health information exposure on the uptake of NCDs screening service

The result of this study is in line with a study conducted by Purdiyani, 2016, that knowledge of integrated guidance post was one of the factors that determine someone coming to integrated guidance post.

Participation in a behavior of using non-communicable disease screening is affected by external factors such as information factors, namely experience, knowledge, and mass media coverage (Ajzen, 2019). High participation is caused by good knowledge about the disease, but low participation is caused by the ignorance or lack of understanding and knowledge. Knowledge and trust are the most important issues in the uptake of disease prevention services (Cross-barnet et al., 2019; Kim, 2017; Leung et al., 2016). Knowledge has an effect on perception and attitude to do screening.

Health information support would increase knowledge, understanding, and trust. It affected perception, attitude, and intention to conduct non-communicable disease screening.

3. The effect of family support on the uptake of NCDs screening service

The result of this study supports the theory of PREECEDE-PROCEED model found by Green and Kreuter (1992), that family support is a factor that encourage or strengthen a behavior. The result of this study is in line with a study conducted by Duffy et al. (2016) that intervention that increased the participation in conducting non-communicable disease screening consistently, including in the population that had poor service, was by reminding them to participate in the screening. Family has a role as a personal reminder.

Family support is a potential motivator that encourages family members to participate and a decision maker to participate in the uptake of non-communicable disease screening (Agide et al., 2018; Hann et al., 2017). High family support has a positive effect on health promotion behavior and affects the participation in conducting screening (Jeong et al., 2019).

Support from strong family in making decision came from the closest family members. They would affect the conviction and trust in making decision to do non-communicable disease screening.

4. The effect of cadre support on uptake of NCDs screening service

The result of this study supports the theory of PREECEDE-PROCEED model found by Green and Kreuter (1992) that health cadre support is one of the factors that encourage or strengthen a behavior occurrs. The result of this study is in line with a study conducted by Sari and Savitri, 2018, that cadre support was the most dominant factor related to the uptake of integrated guidance post for non-communicable disease.

The supports provided by health cadres are in the form of information, motivation, emotional, and assessment supports; they are the key component of social

support (Fisher and Fisher, 1992; Gale et al., 2018). Health cadre is an integral part of the community that can reach groups with complex social needs. They can help to overcome language barriers in increasing participation in the uptake of non-communicable disease screening (Chan and So, 2019; Jarvis et al., 2016).

Strong health cadre support would affect the conviction and trust in making decision to do non-communicable disease screening.

5. The effect of healthy behavior on the uptake of NCDs screening service

The result of this study supports the theory of PREECEDE-PROCEED model found by Green and Kreuter (1992) that high knowledge, positive attitude, strong conviction, value or norm that supports healthy behavior will have a positive effect in healthy behaviour. They are predisposing factors. The result of this study is in line with a study conducted by Carey and El-zaemey (2019) that there was a correlation between healthy behavior and participation in the uptake of non-communicable disease screening. Women with smoking behavior, overweight or obesity, lacking physical activity, and less attention to diet, less contact with doctors, and unhealthy behavior were less likely to participate in the screening (Harder et al., 2018; Petkeviciene et al., 2018; Richard et al. 2015).

Positive healthy behavior would likely affect the conviction to do non-communicable disease screening.

6. The effect of health status on the uptake of NCDs screening service

The result of this study supports the theory of PREECEDE-PROCEED model found by Green and Kreuter (1992) that high knowledge of a disease would affect attitude and conviction to have healthy behavior. It was a predisposing factor. The result of this study is in line with a study conducted by Richard et al. (2015) that someone who suffered or had a history of chronic disease was positively and significantly associated with participating in the uptake of non-communicable disease.

People with chronic diseases really hope to recover. Support is a strong source of motivation for healthy behavior (Noguchi and Shen, 2019).

Great conviction with a positive attitude and a strong intention to recover would affect behavior change to use non-communcable disease screening.

7. The effect of attitude on the uptake of NCDs screening service

The result of this study supports the Theory of Planned Behaviour (TPB) found by Ajzen (1991) that an attitude that referred to a behavior was how far a person had favorable or unfavourable evaluation or assessment, or how far the behavior performance was valued positively or negatively. The result of this study is in line with a study conducted by Fitriani et al. (2016) that there was an indirect correlation between attitude and behavior in using screening through intention. The correlation was positive and significant.

High knowledge had an effect on perception and attitude to do non-communicable disease screening (Hann et al., 2017). The conviction in a behavior would lead to a positive attitude that encouraged the intention to behave in using non-communicable disease screening.

8. The effect of intention on the uptake of NCDs screening service

The result of this study supports the Theory of Planned Behaviour (TPB) found by Ajzen (1991) that intention was an indication of someone's readiness to do certain behaviors. The result of this study is in line with a study conducted by Fitriani et al. (2016) and Jannah et al. (2018) that there was a

positive and significant direct correlation between intention and health service utilization behavior.

Individual behavior in general is based on the intention to behave. Intention was affected by knowledge and perception of individual who encouraged the individual to participate in the screening activities (Turnbull et al., 2018). Intention was a major component and the best predictor for behavior change (Ajzen, 2019). Subjective norm that supported and positive attitude would affect the intention to conduct non-communicable disease screening.

9. The effect of type of integrated health post on the uptake of NCDs screening service

Andersen and Newman (2005) stated that some characteristics affecting the use of health services were: demographic factors including age and sex, social structure factors including the individual status in the community, factors of conviction, attitude about medical care, doctors, and disease. Distance, availability of facilities, access to resources, time, cost, and family support were factors affecting an individual's decision to use health services (Leinonen et al., 2017; Sari and Savitri, 2018; Zhang et al., 2018).

An integrated guidance post consists of basic and primary type. The differences are in the facilities and the available resources. Therefore, facility and resource are factors that greatly affected the uptake of non-communicable disease screening in the integrated guidance for non-communicable disease.

AUTHOR CONTRIBUTION

Riza Firdaus was the main researcher who played a role in conducting the study, formulating the articles of the study, and processing the data. Yulia Lanti Retno Dewi played a role in formulating the theoretical framework of the study. Bhisma Murti played a role in formulating the method of the study and discussing the result of the study.

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CONFLICT OF INTEREST

This study did not have any conflict of interest.

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