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CERDIK Behavior as a Risk Factor for Individuals with Non-Communicable Diseases

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ABSTRACT

Introduction: Non-communicable disease (NCDs) is caused by people's lifestyle that can occur at productive age (15 - 45 years). CERDIK behavior (periodic health checks, stopping smoking, being diligent in physical activity, a balanced healthy diet, adequate rest, and managing stress) in productive age (15 - 45 years) can be used to predict the risk of an individual suffering from non-communicable diseases. The aim of this research was to develop a formula for calculating the risk of non-communicable diseases based on the behavior of CERDIK. Method: Cross-sectional research design. The population of this research was all individuals of productive age between 15 - 45 years who are at risk of suffering from non-communicable diseases in Blitar. The sampling used is simple random sampling. The research variables measured were knowledge, attitude, practice, weight, and height. The research sample was 213 individuals aged 15 years and over who visited fast food / beverage establishments in Blitar. Data analysis used confirmatory factor analysis and binary logit regression. Results: The scores for the knowledge variable ranged from 79.22 ± 5.78, attitudes ranged between 98.89 ± 7.49, and practices ranged from 66.91 ± 6.01. Meanwhile, the influence of the three variables is only 4.6%. The formula for calculating the risk of suffering from NCDs is $1 - \frac{e^{-3.675 + 0.011\,X1 - 0.008\,X2 + 0.067\,X3}}{1 + e^{-3.675 + 0.011\,X1 - 0.008\,X2 + 0.067\,X3}}$ by using the item questions or statements in the questionnaire that are valid and steady. CERDIK behavior (periodic health checks, stopping smoking, being diligent in physical activity, a balanced healthy diet, adequate rest, and managing stress Discussion: The risk of suffering from non-communicable diseases is not only due to individual behavior, but there are other factors that have not been studied.

Keywords: CERDIK behavior, risk of non-communicable diseases, formula

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INTRODUCTION

Non-communicable diseases (NCDs) are chronic diseases with long suffering or disabilities, especially risk factors based on behavior and their impact on household socioeconomic conditions (1). NCDs are the main cause of death globally (2). Data from WHO (*World Health Organization*) show that of the 57 million deaths that occurred in the world in 2008, as many as 36 million or nearly two-thirds were caused by non-communicable diseases. Deaths from non-communicable diseases are expected to continue to increase worldwide, with the largest increase occurring in middle income and poor countries (3). The WHO (2011 cited in Kemkes RI, 2016a) states that more than two-thirds (70%) of the global population will die from non-communicable diseases such as cancer, heart disease, stroke and diabetes. The WHO also predicts that, in 2030, the death tolls due to non-communicable diseases will increase up to 52 million people.

The WHO (2011 cited in Kemkes RI, 2016a) reveals that non-communicable diseases also kill young people. In low- and middle-income countries, all deaths occurred under the age of 60, of which 29% were caused by non-communicable diseases. Meanwhile, in developed countries, 13% of deaths are caused by non-communicable diseases. The proportion of causes of death from non-communicable diseases at the age of less than 70 years was 39% due to cardiovascular disease, 27% due to cancer, 30% due to chronic respiratory disease, and 4% due to diabetes mellitus. The results of the 2016 National Health Indicator Survey showed that the national smoking prevalence was 28.5%. According to gender, the prevalence of male is 59% and female is 1.6%; according to residence, the prevalence of smoking in rural areas is 29.1% and in urban areas it is 27.9%; according to the age group the highest prevalence was at the age of 40-49 years at 39.5%, and at the young age (<20 years) was 11.1% (5). The prevalence of the population suffering from high blood pressure was 30.9% in women 32.9% and men 28.7%; prevalence in urban areas 31.7% and 30.2% in rural areas; prevalence increases with age; The prevalence of obesity with a Body Mass Index ≥ 25-27 is 33.5% and a BMI ≥ 27 is 20.6%. In obesity in the population, the prevalence of women is 41.4% and men are 24.0%; prevalence of obesity in urban areas is 38.3% and 28.2%, respectively; according to the most obese age group this is 40-49 years (38.8%) (6).

Cardiovascular disease, cancer, diabetes mellitus, and obesity are caused by non-communicable diseases. Non-communicable diseases currently tend to occur in individuals aged 15 years and over. The factor that can cause individuals to suffer from NCDs is behaviour (7). Behavior is the result of all kinds of experiences and human interpractices with the environment which are manifested in the form of knowledge, attitudes and practices. Human behavior is influenced by factors of experience, beliefs, physical and socio-cultural means of society (8). Efforts to control NCDs risk factors that have been carried out are in the form of promotion of clean and healthy behavior through CERDIK behavior (*Cek kesehatan berkala* / regular health checks, *Enyahkan rokok* / stopping smoking, *Rajin berolahraga* / being diligent in physical activity, *Diet sehat seimbang* / a balanced healthy diet, *Istirahat cukup* / adequate rest, and *Kelola stress* / managing stress). The main target of activities is healthy community groups, risky behavior, and individuals with non-communicable disease aged above 15 years (1,2,7).

The research objective is expected to produce a formula for the risk of individuals suffering from non-communicable diseases based on knowledge, attitudes, and practices about CERDIK.

METHOD

This research design is *cross-sectional*. The sample of this research consisted of 213 individuals of productive age between 15 - 45 years who are at risk of suffering from non-communicable diseases and visit fast food / beverage providers in Blitar City. The sampling used is simple random sampling. Data collection of knowledge, attitudes, and practices about CERDIK used a questionnaire and was carried out from March to August 2019. The analysis carried out was a factor analysis using Lisrel 8.50, followed by the preparation of a predictor formula for the risk of suffering from non-communicable diseases.

Ethical clearance was given by the Health Research Ethics Commission for Poltekkes Kemenkes Malang Reg. Number: 52 / KEPK-POLKESMA / 2019 dated 18 February 2019.

RESULTS

General characteristics and behavior of CERDIK are presented in Tables 1 and 2.

Table 1. Characteristics of the subjects of visitors to fast food / beverage places in Blitar from March to August 2019

No.	Characteristics	Score			
		Lowest	The highest	Average	sd
1	Age (years)	17	43	21.10	5.62
2	Income (IDR)	750,000	3,000,000	2,101,785.71	636,757.14
3	System (mmHg)	90	130	110.58	8.54
4	Diastole (mmHg)	60	90	78.23	7.52
5	Height (cm)	148	180	159.63	6.74
6	Weight (kg)	38	95	55.12	10.21

Characteristics of the subjects related to CERDIK behavior are presented in Table 4.2 below.

Table 2. Characteristics of visitor subject's fast food / beverage places related to CERDIK behavior in Blitar from March to August 2019

No.	Behavioral-related subject characteristics	f	%
1	Education:		
	- Middle school / equivalent	2	0.90
	- High school / equivalent	172	80.80
	- Diploma	21	9.90
	- Bachelor	5	2.30
	- Postgraduate	13	6.10
2	Occupation:		
	- Student (unemployed)	185	86.90
	- Housewife	1	0.50
	- Lecturer	13	6.10
	- Private	14	6.50
3	Perceptions of the body itself:		
	- Fat	72	33.80
	- Ideal	82	38.50
	- Thin	59	27.70
4	Aware of CERDIK:		
	- Yes	197	92.5
	- No	16	7.5
5	Reading CERDIK writings:		
	- Yes	78	36.6
	- No	135	63.4
6	Reading CERDIK articles:		
	- Yes	116	54.5
	- No	97	45.5
7	Informed about CERDIK from the health workers:		
	- Yes	133	62.4
	- N0	80	37.6

Item statement of knowledge, attitude, and behavior of each 30 items. Confirmatory factor analysis used Lisrel 8.50 to produce a t-test value of at least 1.96 for each item. The results of the confirmatory factor analysis were valid and statistically constant, namely 19 items of knowledge questions in the sixth analysis, 29 items of attitude statements in the second analysis, and 25 items of practice statements in the second analysis. The t-test value of the confirmatory factor analysis results at the beginning and end with a value above 1.96 the knowledge, attitude, and practice variables are presented in Table 3.

Table 3. The t-test value of the confirmatory factor analysis for each question item or the variable statement of knowledge, attitude, and practice using Lisrel 8.50

No. Item	The t test value with Lisrel 8.50					
	Knowledge		Attitude		Practice	
	Initial	End (sixth)	Initial	End (second)	Initial	End (second)
1	0.68	2.98	6.59	6.58	5.63	5.71
2	0.08		7.97	7.96	5.62	5.74
3	1.03	4.59	3.69	3.68	4.02	4.13
4	0.05		7.45	7.45	6.03	5.98
5	**		0.45		5.25	5.08
6	0.27		3.73	3.73	6.69	6.80
7	-1.53		4.44	4.45	5.96	6.05
8	-0.18		7.12	7.12	5.09	5.13
9	-0.23		7.79	7.80	3.42	3.63
10	1.38	4.76	5.89	5.89	2.05	2.11
11	0.49	2.03	5.45	5.43	4.18	4.10
12	1.35	4.22	4.97	4.97	6.72	6.72
13	0.66	2.40	2.87	2.88	4.97	4.86
14	0.37		7.39	7.38	1.76	
15	0.64	2.26	4.48	4.49	5.22	4.69
16	1.09		5.83	5.83	4.92	5.48
17	-0.30		7.32	7.32	1.84	
18	1.85	6.90	6.49	6.48	1.94	
19	0.86	3.12	8.53	8.52	5.50	4.52
20	1.02	4.39	3.70	3.70	1.28	
21	1.26	4.80	5.23	5.22	0.96	
22	1.37	5.92	2.81	2.82	2.57	9.11
23	0.92	4.17	4.34	4.35	3.56	2.94
24	0.33		5.65	5.67	4.64	7.93
25	0.80	3.73	3.98	3.98	3.27	2.13
26	0.79	3.38	3.82	3.82	5.29	*
27	0.70	3.32	6.73	6.73	8.95	*
28	0.99	4.18	3.86	3.86	3.12	*
29	1.33	3.92	5.67	5.68	7.98	*
30	1.27	3.89	2.18	2.16	2.14	*
GFI	0.98	0.88	0.79	0.80	0.72	0.74

Note:
* Automatically not analyzed by software
** All subject answers are the same

Linear modeling analysis uses SPSS with the following assumptions:

1) The risk of suffering from non-communicable diseases (NCDs) is assessed from the body mass index (BMI) which is calculated using the formula $IMT = \frac{BB}{TB^2}$ where body weight is in kg and TB is in m units.
2) After obtaining the BMI value, then a code is given if BMI <23 is called not risky and if BMI> 23 is at risk.
3) Predictor variables use knowledge, attitudes, and practices.
4) Analysis used the calculation basis is not at risk.
5) In analysis, bootstrap was performed 1000 times.
6) The analysis was carried out on individuals who were at risk and not at risk of NCDs and then binary logistic regression was carried out.

Cross-tabulations between individual perceptions and body mass index (BMI) categories are presented in Table 4, while the results of the binary logistic regression are presented in Table 5, 6, and 7.

Table 4. Cross-tabulation between individual perceptions and BMI categories the subject of visitors to fast food / beverage places in Blitar from March to August 2019

		Body mass index (BMI) category							
		Thin		Ideal		Obese		Total	
		f	%	f	%	f	%	f	%
Individual's perceptions of themselves	Thin	27	12.7	32	15.0	0	0.0	59	27.7
	Ideal	4	1.9	69	32.4	9	4.2	82	38.5

	Obese	0	0.0	15	7.0	57	26.8	72	33.8
Total		31	14.6	116	54.4	66	31.0	213	100.0
Phi = 0.890 p = 0.000									

Table 5. Cross-tabulation between observations and predictions of suffering from NCDs for the subject of visitors to fast food / beverage places in Blitar from March to August 2019

		Prediction	
		NCDs risk	No NCDs risk
Observation	NCDs risk	4 (1.9%)	62 (29.1%)
	No NCDs risk	1 (0.5%)	146 (68.5%)
Hosmer and Lemeshow test $\chi 2$ = 4,344 df = 8 p = 0.825			

Table 6. Value of knowledge, attitudes, and practices of the subject of the productive age of visitors to fast food / beverage places in Blitar from March - August 2019

No.	Variable	Minimum	Maximum	Average	Standard Deviation
1	Knowledge	57	90	79.22	5.78
2	Attitude	76	120	98.89	7.49
3	Practice	48	82	66.91	6.01

Table 7. The results of binary logistic regression analysis using SPSS

No.	Variable	β	p	95% confidence interval	
				Bottom	Top
1	Constant	-3.675	0.001	-4,356	-3.005
2	Knowledge	0.011	0.001	0.007	0.015
3	Attitude	-0.008	0.001	-0.014	-0.003
4	Practice	0.067	0.001	0.060	0.073
Nagelkerke R^2 = 0.046; GFI = 0.70					

The results of the analysis presented in Table 7 above, a prediction model can be drawn up as follows:

a) Regression model

$Y = -3.675 + 0.011\ X_1 - 0.008\ X_2 + 0.067\ X_3$ ..... (1)

Where:

Y : There is no risk of suffering from non-communicable diseases
X1 : Knowledge value (interval scale)
X2 : Attitude value (interval scale)
X3 : Practice value (interval scale)

b) Logit model. This model is used to calculate the size of individuals of productive age who are not at risk of suffering from non-communicable diseases.

$$\Pi\ (Y) = \frac{e^{-3.675\ +\ 0.011\ X1\ -\ 0.008\ X2\ +\ 0.067\ X3}}{1+\ e^{-3.675\ +\ 0.011\ X1\ -\ 0.008\ X2\ +\ 0.067\ X3}} \quad \text{..... (2)}$$

c) If using a calculation of the risk of suffering from an infectious disease, the formula is:

$1 - \Pi(Y)$ ..... (3)

and then multiplied by 100% in order to obtain the amount of risk in percent (%).

d) Furthermore, based on the lowest, highest, and average values, the risk value is grouped, namely Low if it is in the range 0 - 60.0%, Medium if it is in the range more than 60.0% - 80.0%, and High if it is more than 80.0%.

Simulations based on the formula for the risk of suffering from NCDs such as ..... (3) are presented in Table 8.

Table 8. The simulation results of the risk of suffering from NCDs were calculated using Excel

No.	Value (based on questionnaire - valid and steady)			High risk (1-ΠY)	Risk category
	Knowledge	Attitude	Practice		
1	40	50	30	83.55%	High
2	40	50	60	40.49%	Low
3	40	50	70	25.83%	Low
4	40	50	80	15.12%	Low

No.	Value (based on questionnaire - valid and steady)			High risk (1-ΠΥ)	Risk category
	Knowledge	Attitude	Practice		
5	20	50	80	18.17%	Low
6	20	40	80	17.01%	Low
7	20	30	80	15.91%	Low
8	20	30	60	41.95%	Low
9	40	50	80	15.12%	Low
10	40	50	30	83.55%	High
11	40	50	30	83.55%	High

DISCUSSION

Non-communicable diseases (NCDs) have prompted an agreement between developing countries to formulate a global strategy for their prevention and control, so that in Indonesia it becomes a strategic issue for the SDGs agenda (2030) and a development priority (7,9). The guidebook also states that the results of Basic Health Research in 2018 shows an increase in the key indicators of NCDs listed in the 2015-2019 National Medium Term Development Plan in the health sector, namely (1) The prevalence of people with high blood pressure in the population aged 18 years and over increased from 25.8% to 34.1%; (2) Prevalence of obesity population aged 18 years and over increased from 14.8% to 21.8%; and (3) The smoking prevalence of the population aged ≤18 years increased from 7.2% to 9.1% (10). It is also shown that other NCDs data are as follows (1) The prevalence of asthma sufferers in the population of all ages decreased from 4.5% to 2.4%; (2) The prevalence of cancer survivors increased from 1.4 per to 1.8 per mile; (3) Stroke prevalence among population aged ≥ 15 years increased from 7 to 10.9 per mile; (4) The prevalence of chronic kidney disease ≥ 15 years increased from 2.0 per mile to 3.8 per mile; (5) The prevalence of diabetes mellitus in the population aged ≥ 15 years increased from 6.9% to 10.9%; (6) The prevalence of inadequate physical activity among people aged ≥ 10 years increased from 26.1% to 33.5%; and (7) The prevalence of less fruit / vegetable consumption among people aged ≥ 5 years increased from 93.5% to 95.5% (6).

The prevalence of the above incidents shows that NCDs is a disease tendency suffered by people aged 10 or 15 years and over, which can shift the cause of death in most of the productive age between 15 - 45 years. If this situation occurs, it can increase the burden on the government and society for health financing and can reduce population productivity. Efforts that can be made by nurses as health professionals are realizing their role as educators to target individuals, families, groups and communities.

The role of nurses as educators (11) is (1) raising awareness that health problems are a shared responsibility (between government and society), (2) disseminating the prevention and control of non-communicable disease risk factors to the entire community, and (3) increasing community independence through the application of culture CERDIK behaviour (1,7,9). What is meant by the CERDIK behavior is regular health checks, eliminating cigarettes (meaning not smoking actively or passively), diligent exercise (at least 30 minutes every day), a balanced diet according to the body's needs, adequate rest as needed, and managing stress appropriately. The target of nurses while carrying out the role of educators can be carried out in any place, including in their own family environment, because nurses are also individuals who are part of every community structure. Most importantly, nurses must act as role models for the individuals around them so that they can act as a culture (habit) (8,12,13). The Big Indonesian Dictionary online defines that culture is a mind or customs or something that has become a habit that is difficult to change. This means that culture (habit) must be initiated from the role model of the nurse as a health worker who provides continuous service to clients and all the time.

There are several reasons that non-communicable diseases need to receive attention and priority from each country, namely (1) they occur in all countries in the world (low, low to medium, medium to high income countries, and high), (2) the global age range of NCDs sufferers deaths shows the youngest at 30 years, (3) and the probability of deaths of NCDs sufferers in all countries is between 10-30%. It is also reported that, in all countries in the world, the lowest age for alcohol consumption and smoking is 15 years (3). In fact, the reason for the importance of handling non-communicable diseases is stated that "Prevention of NCDs is crucial, but investing in better management of NCDs is also an essential component of any national response to NCDs which may prevent one third to one half of premature deaths from such diseases."

The follow-up to WHO recommendations for handling and preventing deaths due to NCDs in Indonesia is carried out at all levels through Presidential Instruction No.1 of 2017 concerning Healthy Living Community Movement and Minister of Health Regulation No. 71 of 2015 concerning Prevention of Non-Communicable Diseases (14,15). Implementing activities are carried out at the provincial, city / regency and community levels. The implementation of activities at the provincial and city / regency levels is the issuance of a commitment by the Regional Government by issuing a Regulation. Implementation in the community is carried out by establishing PTM POSBINDU (NCDs Integrated Guidance Post) with regular activities such as (1) measuring blood pressure, (2) measuring blood sugar, (3) measuring body mass index, (4) risky behavior interviews, and (5) education healthy lifestyle behavior carried out by the community itself (9).

The subjects involved were aged between 17 - 43 years who were classified as productive and appropriate as individuals at risk of suffering from NCDs. Regulation of the Minister of Health of the Republic of Indonesia Number 4 of 2019 affirms that what is meant by productive age is 15 - 59 years, who must be screened at least once a year for non-communicable diseases including: a) Measurement of height, weight and abdominal circumference; b) Measurement of blood pressure; c) blood sugar check-up; and d) Anamnesis of risky behaviour (9). That is, the productive age is an age that is very susceptible to NCDs because at this age each individual has a tendency to change their lifestyle, including lack of activity, always consuming fast food or drinks, lack of rest and sleep, and excessive use of electronic goods, which can be a risk factor for suffering

from NCDs. Subject behavior according to the characteristics (Table 2) is namely subjects with high school education or equivalent at most (80.80%) and not working (86.90%) so that they have enough time and take advantage of their spare time to behave unhealthily.

The blood pressure of the research subjects was categorized within normal limits at systolic pressure (Table 1) but it needs to be a concern in subjects who have a diastolic pressure of 90 mmHg. This diastolic blood pressure is known as hidden diastolic hypertension, which can occur at productive age. Hidden diastolic hypertension also occurs in India (16) which has a larger population composition and a pyramid similar to Indonesia. The results of the research in India illustrate that hidden diastolic hypertension occurs mostly at the age of 40-49 years with risk factors on gender, physical activity, and body mass index. Similar situations with India also occur in Saudi Arabia (17). That means people of productive age need to be aware of themselves if they have blood pressure that rises from normal to systolic or diastolic because it can become real or hidden hypertension at any time. Efforts to prevent hypertension can be done early on by cultivating CERDIK behavior, which is easy to do by anyone and anywhere.

The body mass index (BMI) category according to the Ministry of Health of the Republic of Indonesia is grouped into four, namely thin, normal, overweight, and obese. The calculation method uses the formula $BMI = \frac{Weight\ (kg)}{Height\ (m)^2}$. Subjects' perceptions about their own body mass index as in Table 2 and which are cross-tabulated with the results of calculations using the cross-tabulated formula in Table 4, which can be said to have statistical suitability. This situation is possible that the subject has a rational assessment of themselves, which is supported by the level of education of the subject as almost all of them have high school education and above, as much as 99.1% (Table 2).

The results of the researchers' observations were compared with the results of body mass index calculations using the formula presented in Table 5. and obtained p value = 0.825 in the Hosmer and Lemeshow test. These results prove that the cross-tabulation of perceptions and the results of the BMI calculation (Table 4) are very good, which is supported by the test results in Table 5 so that data compatibility can be continued by carrying out binary logistic regression analysis (11). Binary logistic regression was performed to calculate the risk of suffering from NCDs based on BMI. The results of the regression analysis obtained values, as in Table 7. Statistically, knowledge, attitude, and practice factors only contributed to the risk of NCDs by 0.046 (5%), but, when analyzed simultaneously, it was found that age, current blood pressure, and perception did not significantly contribute.

The results of the study illustrate that the current productive age has good knowledge about periodic health checks, eliminates cigarettes, is active in exercising at least 30 minutes, has a balanced diet as needed, adequate rest, and manages stress (CERDIK) as in Table 2. Even though the Presidential Regulation or the Ministry of Health of the Republic of Indonesia, which was announced for only a few years, has made productive age groups make an effort to recognize and take practices that support CERDIK, such efforts need to get appreciation from the health sector so that it can be improved and made into a healthy culture (habit) in society in general.

The formulation of a formula to calculate the risk of suffering from NCDs begins with an item analysis for each question or statement used in the questionnaire. Analysis of questions or statements is called valid and steady if the t-test value of each item is 1.96. The knowledge questionnaire from 30 questions was obtained, which were valid and steady, as many as 20 questions with a Goodness of Fit Index (GFI) value of 0.88 in the sixth analysis. The attitude questionnaire from 30 statements was obtained, which were valid and steady, as many as 29 statements with a Goodness of Fit Index (GFI) value 0.80. in the second analysis, and the practice questionnaire from 30 statements obtained valid and steady as many as 20 statements with a Goodness of Fit Index (GFI) value of 0.74 in the second analysis. The GFI value on the knowledge factor decreased, but the attitude and practice factors increased, where the three factors had a minimum value of 0.70. The GFI value is good for variable prediction analysis.

Knowledge has a score of 1 - 3 and 20 valid and steady questions so that the knowledge score ranges from 79.22 + 5.78, attitudes have a score of 1 - 4 and 29 statements are valid and steady so that the attitude score ranges between 98.89 + 7.49, and practice has a score of 1 - 3 and 20 questions that are valid and steady, so that the practice score ranges from 66.91 + 6.01 (Table 3). Furthermore, binary logistic regression analysis was carried out because the predictive variable was categorized as having no risk (as standard) and having risk. The results of the analysis (Table 7) obtained the regression model formula Y = -3.675 + 0.011 X1 - 0.008 X2 + 0.067 X3 where Y is not the risk of suffering from NCDs. Analysis using binary logistic regression resulted in the formula not at risk of suffering from NCDs is $\Pi\ (Y) = \frac{e^{-3.675\ +\ 0.011\ X1\ -\ 0.008\ X2\ +\ 0.067\ X3}}{1+\ e^{-3.675\ +\ 0.011\ X1\ -\ 0.008\ X2\ +\ 0.067\ X3}}$ so the risk of suffering from NCDs is $1 - \Pi(Y)$. Furthermore, the probability proportion is calculated as % by multiplying 100%. However, the effect value of the three variables (knowledge, attitude, and practice) on the risk of suffering from NCDs is very small, which is 0.046, which means that it is only 4.6% and as much as 95.4% due to other factors that are not researched at this time.

Table 8 illustrates the simulation of changes that occur in the value of knowledge, attitudes, and practices that have different magnitude of changes. This means that practices have a very important role compared to knowledge and attitudes. The lower the value of one's practices, the greater the risk of suffering from NCDs. The Healthy Indonesia Program Book (5) and NCDs Management Guidelines (9) state that individual practice is a major and important factor in preventing NCDs, so that each individual must routinely adopt a healthy lifestyle through CERDIK.

CONCLUSION

The variables of knowledge, attitudes, and practices toward the risk of suffering from NCDs were only 4.6%, the rest was influenced by other factors and the formula for calculating the risk of suffering from NCDs, namely $1 - \frac{e^{-3.675\ +\ 0.011\ X1\ -\ 0.008\ X2\ +\ 0.067\ X3}}{1+\ e^{-3.675\ +\ 0.011\ X1\ -\ 0.008\ X2\ +\ 0.067\ X3}}$ with a valid and steady questionnaire question item.

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Attachment

The questionnaire on the next page is a questionnaire that has a valid and steady question or statement item based on the results of the analysis

Before filling out the questionnaire, you should first read the following:
1. When you are reading this questionnaire, do not think about taking assessments like in school and asking other people.
2. Please think according to what is understood, known, felt, or done.
3. Place a check mark (√) in the appropriate column that you understand, know, feel, or do.

Knowledge about CERDIK

No.	Question	Right	Wrong	No Clue
1.	Individual health can be known from the beginning (early) before there are complaints			
2.	Health checks must be carried out regularly at least every month			
3.	Smoking is one of the causes of lung cancer and lung infections			
4.	Sports can be done anywhere			

No.	Question	Right	Wrong	No Clue
5.	Good exercise is done regularly every day, even if only the head, hands and feet			
6.	Exercise should be done by someone who sits a lot			
7.	Exercise must consider age and body capabilities			
8.	Good exercise does not have to sweat			
9.	Sources of protein can come from soybeans			
10.	Nutrients that must be consumed every day include minerals and vitamins			
11.	Healthy food sources can be obtained from your own plants around the house			
12.	Every 3-4 hours of work should take a break of 15-30 minutes			
13.	Good rest is not having to sleep			
14.	A good way to rest is to listen to classical or traditional music			
15.	Sleep as a good rest is from 22.00 - 04.00 the next day			
16.	Healthy individuals are good at avoiding problems			
17.	The problem is the incompatibility of the individual's (own) mind after seeing others			
18.	A form of avoiding trouble is asking the person who does			
19.	The problem that is occured must be immediately resolved by yourself or the help of others			
20.	Good problem solving is by consulting a psychologist			

Before filling out the questionnaire, you should first read the following:

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Attitude about CERDIK

No.	Statement	Strongly agree	Agree	Disagree	Strongly Disagree
1.	Regular health checks should be at least once every month				
2.	Health checks can be carried out at the Puskesmas or the nearest health service facility				
3.	Health checks can be carried out by anyone who has been trained				
4.	Health examination as an early measure to determine an individual's health status				
5.	Active smokers must be provided with a designated smoking area				
6.	Reducing the number of active smokers by increasing cigarette excise prices				
7.	The house as a family residence should not contain cigarette smoke				
8.	Active smokers must be provided with education about the dangers of smoking regularly				
9.	Active smokers must pay a premium for health costs for passive smokers				
10.	Exercise by moving the hands, feet and head can be done while sitting and lying down				
11.	Exercise regularly for 30 minutes and every day				
12.	Good exercise needs the help of an instructor				
13.	Exercise can be done in the home or work environment				
14.	After exercising, drink at least 1 liter of water				
15.	Healthy food is food without added preservatives and flavorings				
16.	Healthy food is very easy to obtain at home				
17.	Healthy food doesn't have to be expensive				
18.	Healthy food sources can be obtained from the home environment				
19.	Buy healthy food at a place that has a Health Certificate				

No.	Statement	Strongly agree	Agree	Disagree	Strongly Disagree
20.	Time and place for rest at school or work should be provided				
21.	During rest time, it is not allowed to carry out any routine activities				
22.	A rest area needs to be provided with classical (traditional) music accompaniment				
23.	During rest periods, sleep is recommended whenever possible				
24.	During rest periods and / or sleep can't be disturbed by any activities				
25.	The way to reduce problems with yourself is to explain the truth to others				
26.	Confessing guilt and apologizing is one way of reducing problems				
27.	Avoiding talking about other people's problems as a way of reducing one's own problems				
28.	Consult an expert / psychologist / counselor how to reduce self-problems				
29.	Silence and self-introspection as a way to reduce self-problems				

Before filling out the questionnaire, you should first read the following:
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3. Place a check mark (√) in the appropriate column that you understand, know, feel, or do.

Practice about CERDIK

No.	Statement	Always / Often	Sometimes	Never
1.	Take measurements of blood pressure or blood laboratory at least every month			
2.	Consult health workers about the discharge or body changes experienced			
3.	Visiting health service facilities (Puskesmas, Supporting Puskesmas, Hospitals, Private Practices) if you have complaints or your body is not healthy			
4.	Looking for information through the correct source (book) or media			
5.	Following the advice given from others who understand health			
6.	Prohibit active smokers who are smoking near you, babies, toddlers, breastfeeding mothers, or pregnant women			
7.	Encourage others as active smokers to quit smoking			

No.	Statement	Always / Often	Sometimes	Never
8.	Avoid smoking provided by other people or purchased by yourself			
9.	If you smoke, stay away and isolate so you are not close to babies, toddlers, nursing mothers, or pregnant women			
10.	Tell yourself to quit smoking right away			
11.	Walk or run for at least 20 minutes every morning			
12.	After sitting for 2-3 hours, do standing and walking activities for at least 5 minutes around the seat / work			
13.	After exercising, drink at least 1 liter of water			
14.	Avoiding strenuous exercise that is not suitable for your age and body condition			
15.	More protein for eating			
16.	Choose foods that do not contain preservatives or flavorings			
17.	Sleep during day, take a break in the afternoon			
18.	Listen to classical / traditional music during a break in the afternoon			
19.	Sleep at night from 22.00 until 05.00			
20.	During night sleep, turn off / avoid radio / television sounds			