Risk Factors of Non-communicable Diseases Patient Visit in Cipunagara Health Center, Subang District, West Java Province, Indonesia

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Abstract: Hypertension 10.5%, stroke 6.6%, asthma 5%, COPD 4%, diabetes mellitus 1.3%, cancer 1%, coronary heart disease 0.5%. In Cipunagara Health Center at 2016, the number of NCD (non-communicable disease) was 1,098 cases and 53.6% cases were hypertension. Research purpose was to prove risk factor of hypertension in Cipunagara Health Center, Subang district at year 2017. Materials and methode: Research applied, crossectional, sample 61 respondents, incidental sampling, one day in Cipunagara and analyzed descriptive and analytic correlation. Results: 85.2% hypertension and complication, 14.8% diabetes mellitus, age $\geq$ 60 year 52.5%, women 73.8%, elementary level education 93.4%, housewife 54.1%, farmer 39.3%, genetic 75.4 %, smoking 23.0%, alcohol 24.6%, less activity 82%, less fruit and vegetables 80.3%, high salt consumption more than 1 tablespoon 68.9%, high caloric consumption 52.5%, good manage stress 73.8%, obesity 59%, abdominal sircumference normal 70.5%. Correlation results showed only salt consumption was significant and other variables included in model regression smoking, alcohol, stress, calory, activity. Final model of regression salt consumption p 0.019, OR 6.693, 95% CI.1.374-32.612, R216%; caloric consumption p 0.099, OR 0.229, 95% CI 0.040-1.322, R28%. Conclusions: non-communicable diseases risk factor was highest consumption salt and calory has contributed 24 %. Suggestions: reduced salt and calory consumption, salt engineering for reduce hypertension.

Key words: Hypertensi, salt consumption.

1. Background

NCD (non-communicable disease) is a chronic degenerative disease, not caused by a germ infection so it is not transmitted from person to person. NCD has a long duration and generally develops slowly. The four main types of NCD according to WHO are cardiovascular disease (coronary heart disease, stroke), cancer of chronic respiratory diseases (asthma and chronic obstructive pulmonary disease) and diabetes [1]. NCDs are the most common cause of death in Indonesia. Data show that in urban areas, deaths from stroke in the 45-54 age groups were 15.9%, while in the rural areas it was 11.5% [2]. This shows that NCD

(mainly stroke) attacks in productive age. Meanwhile, the prevalence of other NCDs is quite high, namely hypertension (31.7%), arthritis (30.3%), heart disease (7.2%) and injuries (7.5%) [3]. Asthma prevalence (4.5%), COPD (Chronic Obstructive Pulmonary Disease) (3.7%) and cancer (1.4%). The prevalence of DM and hyperthyroidism in Indonesia based on answers to a doctor's diagnosis was 1.5% and 0.4%. NCD triggers a variety of risk factors including smoking, an unhealthy diet, lack of physical activity, and an unhealthy lifestyle. Data reported 34.7% of the population aged 15 years and over smoking every day, 93.6% lacking consumption of fruits and vegetables and 48.2% lacking physical activity [2]. Data obtained from the Cipunagara Health Center for the number of NCDs in 2016 were 1,098 cases, the

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highest being hypertension with a total of 589 cases. The aim of the study was to know risk factors of NCDs patient visit in the Cipunagara Health Center. For research method, we used applied study, cross sectional design, accidental sampling of population patients visit in Public Health Center Cipunagara. Dependent variable: NCD, independent variables: age, gender, education, occupation, family history, smoking, alcohol, phisical activity, fruit and vegetable, high sodium intake, stress, body mass index, waist circumference. The descriptive analysis, Chi Square and multiple regression.

2. Result

Table 1 shows the highest NCD in Cipunagara Health Center is hypertension with a total of 52 cases (85.2%) and 9 diabetes mellitus (14.8%).

Table 2 shows that the 61 samples collected which were persons with NCDs (PTM), the age above 45 years was 58 people (95.1%) while the age under 45 years was 3 people (4.9%). Judging from the sexes, the majority occurred in women with a total of 45 people (73.8%) while in men 16 people (26.2%). In terms of education, respondents with elementary education amounted to 57 people (93.4%), junior high school as many as 3 people (4.9%) and undergraduate 1 person (1.6%). According to the highest case work, there were 33 housewives (54.1%), and many farmers 24 people (39.3%), 2 merchants (3.3%), teachers and drivers each one 1 person (1.6%).

Based on Table 3, it can be seen that the first NCD risk factor is family history of NCD, 46 people (75.4%) stated that there was a history of NCD and 15 people (24.6%) who did not have a history of NCD. Judging from the smoking habits, there were 47 non-smokers (77.0%) while 14 people smoked (23.0%); this was because the respondents were mostly women. Likewise on the risk factors for alcohol consumption habits, there were 46 people who did not consume alcohol (75.4%). For physical activity, the majority of

Table 1 Frequency distribution of NCDs in Cipunagara Health Center.

No.	NCD types	Cases	Percent (%)
1	Hypertension and its complications	52	85.2%
2	Diabetes mellitus	9	14.8%
	Total	61	100%

Table 2 NCD risk according to socio demographic factors in Cipunagara Health Center.

No.	NCD Respondents characteristics	Cases	Percent (%)
	Age		
1	< 45 year	3	4.9%
	≥ 45 year	58	95.1%
	Gender		
2	Male	16	26.2%
	Female	45	73.8%
	Education		
	SD	57	93.4%
3	SMP	3	4.9%
	SMA	0	0.0%
	Bachelor	1	1.6%
	Occupation		
	Farmer	24	39.3%
4	Domestic mom (housewives)	33	54.1%
	Teacher	1	1.6%
	Merchant	2	3.3%
	Driver	1	1.6%

Table 3 NCD risks based on behavior, BMI and stomach circumference in Cipunagara Health Center.

No.	NCD risk factor	Cases	Percent
1	Family history		
	No NCD history	15	24.6%
	NCD history	46	75.4%
2	Smoking habit		
	No smoking	47	77.0%
	Smoking	14	23.0%
3	Alcohol consumption		
	No	46	75.4%
	Yes	15	24.6%
4	Physical activity		
	Adequate	11	18.0%
	Less adequate	50	82.0%
5	Fruit and vegetable consumption		
	Adequate	12	19.7%
	Less	49	80.3%
6	High sodium eating habits less than or equal to 1 tablespoon	19	31.1%
	More than 1 tablespoon	42	68.9%
7	High-calorie eating habits	29	47.5%
	Regular consumption of low-calorie foods		
	Regular consumption of high-calorie foods	32	52.5%
8	Stress management		
	Can manage stress	45	73.8%
	Cannot manage stress	16	26.2%
9	Body mass index		
	Ideal (< 25.0)	25	41.0%
	Obesity (≥ 25.0)	36	59.0%
10	Waist circumference		
	Normal ($P < 80 L < 90$)	43	70.5%
	Not normal ($P > 80 L > 90$)	18	29.5%

respondents lacked physical activity by 50 people (82.0%).

The consumption of fruits and vegetables mostly still lacks consumption of fruit and vegetables as many as 49 people (80.3%), who have high sodium eating habits as many as 42 people (68.9%). Feeding habits are high in calories as many as 32 people (52.5%) while respondents who could control stress were 45 people (73.8%) from 61 respondents. While seen from the body mass index (BMI), most of the respondents were obese as many as 36 people (59.0%) and respondents who had abnormal abdominal circumference as many as 18 people (29.5%).

Based on Table 4 it is known that the respondents with the most PTM history in hypertensive patients

were 82.6%, and DM patients were 17.4%. Respondents with no history of PTM in hypertensive patients were 93.3% whereas in DM patients 6.7%. Chi square test results were not significant $p = 0.309$ and the OR value was 0.339.

Based on smoking habits, it is known that respondents who smoked the most in hypertensive patients were 78.6%, and DM patients were 21.4%. Respondents who did not smoke in hypertensive patients were 87.2% whereas in DM patients as much as 12.8%. Chi square test results were not significant $p = 0.422$ and the OR value was 0.537.

Based on alcohol consumption, it is known that respondents who consumed the most alcohol in hypertensive patients were 80.0%, and DM patients

Table 4 Relationship between NCD risk factors based on behavior, BMI and abdominal circumference with NCD at Cipunagara Health Center.

No.	NCD risk factors	NCD cases				p-value	OR (95% CI)
		No Hypertension		Hypertension			Lower-Upper
		n	%	n	%		
1	Gender						
	Male	3	18.8	13	81.2	0.686	1.500
	Female	6	13.3	39	86.7		0.328-6.868
2	Age						
	Productive (< 60 years old)	4	12.5	28	87.5	0.724	0.686
	Elderly (≥ 60 years old)	5	17.2	24	82.8		0.165-2.846
3	Education						
	Elementary School	9	15.8	48	84.2	1.000	0.842
	≥ yunior high school	0	0.0	4	100.0		0.753-0.942
4	Occupation						
	Working	3	10.7	25	89.3	0.488	0.540
	No Working (all house wife)	6	18.2	27	81.8		0.162-2.143
5	Family history (Genetic)						
	No NCD history	1	6.7	14	93.3	0.430	0.339
	NCD history	8	17.4	38	82.6		(0.039-2.964)
6	Smoking habit						
	No smoking	5	10.6	42	89.4	0.191	0.298
	smoking	4	28.6	10	71.4		(0.067-1.314)
7	Alcohol consumption						
	No	5	10.9	41	89.1	0.204	0.335
	Yes	4	26.7	11	73.3		(0.077-1.464)
8	Physical activity						
	Adequate	0	0.0	11	100.0	0.191	1.220
	Less adequate	9	18.0	41	82.0		(1.071-1.389)
9	Fruit and vegetable consumption						
	Adequate	2	16.7	10	83.3.	1.000	1.200
	Less	7	14.3	42	85.7		(0.216-6.676)
10	High sodium (salt)consumption habits						
	Less than or equal to 1 tablespoon	6	31.6	13	68.4	0.021	6.000
	More than 1 tablespoon	3	7.1	39	92.9		(1.310-27.472)
11	High-calorie consumption habits						
	Regular consumption of low-calorie foods	2	6.9	27	93.1	0.151	0.265
	Consumption of high-calorie foods	7	21.9	25	78.1		(0.050-1.395)
12	Stress management						
	Good manage stress	5	11.1	40	88.9	0.224	0.375
	Bad manage stress	4	25.0	12	75.0		(0.087-1.622)
13	Body mass index						
	Ideal (< 25.0)	5	20.0	20	80.0	0.467	2.000
	Obesity (> 25.0)	4	11.1	32	88.9		(0.0479-8.345)
14	Abdominal circumference						
	Normal (P < 80, L < 90)	6	14.0	37	86.0	1.000	0.811
	Not normal (P > 80, L > 90)	3	14.8	15	85.2		(0.179-1.964)

were 20.0%. Respondents who did not consume alcohol in hypertensive patients were 87.0% whereas in DM patients 13.0%. Chi square test results were not significant $p = 0.509$ and OR value was 0.600.

Based on physical activity, it is known that the respondents who lacked the most physical activity in hypertensive patients were 84.0%, and DM patients were 16.0%. Respondents with sufficient physical activity in hypertensive patients were 90.9% whereas in DM patients as much as 9.1%. Chi square test results are not significant $p = 0.559$ and the OR value is 0.529.

Based on fruit and vegetable consumption, it is known that respondents who consumed fruits and vegetables were less than 85.7%, and DM patients were 14.3%. Respondents who consumed fruits and vegetables were enough for hypertensive patients as much as 87.2% whereas in DM patients 16.7%. Chi square test results were not significant $p = 0.835$ and an OR value of 1.200 which meant that hypertension patients 1.2 times had a tendency to eat less fruits and vegetables.

Based on intake high sodium, it is known that respondents who ate high sodium more than 1 tablespoon per day were the most in patients with hypertension as much as 92.9%, and DM patients as much as 7.1%. Respondents who ate less than 1 tablespoon of sodium in hypertensive patients were 63.2% whereas in DM patients as much as 36.8%. Chi square test results stated that there was a significant relationship p 0.011, OR 7.583 which means that patients with hypertension 8 times have a tendency to eat high sodium more than 1 tablespoon per day.

Based on high-calorie meals, it is known that respondents who used to eat high in calories were the highest in hypertension patients as much as 75.0%, and DM sufferers were 25.0%. Respondents who were not used to eating high calories in hypertensive patients were 93.3% whereas in patients with DM as much as 6.9%. Chi square test results indicate there is a significant relationship $p = 0.056$ and an OR value of 0.222.

Based on stress variables, it is known that respondents who cannot manage stress are most prevalent in hypertension patients as much as 88.9%, and DM sufferers are 11.1%. Respondents who can manage stress in hypertensive patients are 88.9% whereas for DM patients 11.1%. Chi square test results were not significant $p = 0.062$ and the OR value was 0.275.

Based on the BMI variable, it is known that the most obese respondents in hypertensive patients were 86.1%, and DM patients were 13.9%. Non-obese respondents in hypertensive patients were 84.0% whereas in DM patients 16.0%. Chi square test results are not significant $p = 0.819$ and the OR value is 1.181.

Based on variable abdominal circumference, it is known that respondents with the most abnormal abdominal circumference in hypertensive patients were 73.7%, and DM patients were 26.3%. Respondents with normal abdominal circumference in hypertensive patients were 88.4% whereas for DM patients 11.6%. Chi square test results were not significant $p = 0.287$ and the OR value was 0.461.

2.1 Multivariate Analysis by Multiple Logistic Regression

Base on Table 5 multivariate analysis was carried out to see several variables that were jointly related to the incidence of NCD, especially hypertension and non hypertension (DM). In this study a multiple logistic regression test was used (binary logistic regression) as Table 4 to find the effect of NCD events, especially hypertension and DM. In result analysis of this study there was only salt consumption, and five variables were not significant despite included in multivariate analysis because p value < 0.250; there were calory, stress, physical activity, alcohol and smoking. The final analysis only salt consumtion was significant and probability almost seven times to got hypertension compared with no hypertension (Diabetes Melitus). Calory consumption was not

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Table 5 Multiple logistic regression test results for the final risk factor related to NCD.

Variable	p value	OR	OR 95% C.I.		R^2 Nagel Kerke
			Lower	Upper	0.24 (24%)
Salt consumption	0.019	6.693	1.374	32.612	0.158 (16%)
Caloric consumption	0.099	0.229	0.040	1.322	0.081(8.1%)

significant as counfounding factor because when calory consumption was issued, there was change odd ratio amount > 10.0%, so calory was inclued in this model of study. R^2 two variables contribute 24 %.

3. Discussion

3.1 Effect of Sodium High Consumption on NCD (Hypertension) Cases

Based on the results of the study it was found that respondents who ate high sodium more than 1 tablespoon per day were the most in patients with hypertension as much as 92.9%, and DM patients as much as 7.1%. Respondents who ate less than 1 tablespoon of sodium in hypertensive patients were 63.2% whereas in DM patients as much as 36.8%. Chi square test results stated that there was a significant relationship of $p = 0.011$ and an OR value of 7.583, which means that patients with hypertension 7 times more have a tendency to eat high sodium more than 1 tablespoon per day. After multivariate analysis, caloric and stress OR become 10.360, p 0.07, 95% CI 1.878-57.148.

The results of this study are in accordance with research conducted by Burhanudin which shows that people who have salty consumption habits will be at risk of developing hypertension by 3.22 times compared to people who are not used to consuming salty [4]. Radecki Thomas E. J. D.'s research shows the same thing, that people who have salty consumption habits will be at risk of developing hypertension by 4.35 times compared to those who do not normally consume salt [5]. According to Lany Gunawan, if salt intake is 5-15 g/day the prevalence of hypertension increases to 15-20% [6].

In a study conducted by Ade Dian Anggraini et al. [7] who stated that the results of a large analysis of the risk of sodium consumption patterns on the incidence of hypertension found an OR value of 2.643 at a 95% confidence level Cl (1.287-5.429) [4]. This means that the probability of hypertension occurring in high sodium consumption patterns is about 2.6 times higher than low sodium consumption patterns. Furthermore PAR (population attributable risk) obtained a value of 0.54 (54%), meaning that about 54% of the incidence of hypertension can be prevented by eliminating high salt intake pattern factors [7].

3.2 Effect of High Calorie Consumption on NCD (Hypertension) Cases

Based on the results of the study it was found that respondents who used to eat high in calories were the highest in hypertension patients as much as 75.0%, and DM patients as much as 25.0%. Respondents who were not used to eating high calories in hypertensive patients were 93.1% whereas in patients with DM as much as 6.9%. In Chi square test results indicate there is a significant relationship $p = 0.056$ and an OR value of 0.222 (95% CI 0.093-1.150).

In the study conducted by Anggun, et al. [8] who stated that based on the results of Chi-Square analysis at a significance level of 95% and a value of α or error level = 0.05, it was obtained $p = 0.000$, so there is a relationship between fat intake and the incidence of hypertension ($p < 0.05$). This is due to the culture of eating the Cipunagara community, in the Cipunagara community the most widely consumed fatty foods are beef meat, chicken and fried foods with a frequency of meat eating 3-4 times per month and fried foods 2 times per day.

This research is quite in line with research conducted by Salsabila in 2014 about the relationship between central obesity, energy intake, fat, and

sodium with the incidence of hypertension showed that there was a significant relationship between fat intake and hypertension with a value of $p = 0.03$ [9].

3.3 Association between Stress and Hypertension

The result of study stress is no significant despite in this model stress as confounding factor of Hypertension, other study such as Kalerin Indah Islami et al. [10] (significant p 0.001 OR 0.473, number ofsample 47 this study 61 samples), Yun Pan et al. [11] (systimatic review with meta-analysis $n = 151,389$ OR 1.118, 95% CI 1.02-1.37, $p < 0.001$). Physiologically, stressful situations activate the hypothalamus which then controls two systems neuroendocrine: the sympathetic system and cortical system adrenal. The sympathetic nervous system responds to nerve impulses from the hypothalamus by activating various organs and smooth muscles that are below control, for example, it improves heart rate and dilates the pupil. Sympathic nerve system also signals the adrenal medulla to release epinephrine and norepinephrine into the stream blood.

4. Conclusion

Based on the results of operational research on the risk factors for the occurrence of NCDs, especially hypertension at Cipunagara Health Center, Subang Regency can be concluded as follows: (1) Variables that have no significant relationship with the incidence of NCD in the Cipunagara Health Center are: age, sex, education, employment, family history, smoking habits, alcoholic habits, physical activity, consumption of fruit and vegetables, BMI and stomach circumference. (2) Variables that have a significant relationship with the incidence of NCD in the Cipunagara health center are high natrium consumption, high consumption of fat and stress. (3) The most dominant risk factor affecting the incidence of NCD in the Cipunagara Health Center is high sodium consumption.

Acknowledgements

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