

Knowledge as the most related factor to individual dietary of persons with DM Type II genetical History in 1st Kesugihan Public Health of Cilacap Regency

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Abstract—Type 2 Diabetes mellitus is described as a metabolic abnormality caused by various etiologies such as genetical history, unbalanced dietary, and sedentary life style. Genetical hystory is a risk factor that cannot be changes. Peoples with genetical hystory should be changed their live style, especially personal dietary. However, many people did not realized the risk and still consuming more carbohidrate and fat in their diet. This study aimed to determine the related factors to individual dietary of a person with DM Type 2 genetical history in First Kesugihan Public Health of Cilacap Regency. It used analytic survey approach with cross sectional method. The sampling technique was cluster random sampling. There were 52 people with DM type 2 genetical history taken from Kesugihan district. Spearmans rank is used to analized the data, then continued with linier regretion. The result showed that there were relationship between education (p value 0,002), socioeconomic state (p value 0,0001), knowledge (p value 0,0001) and personal preference (p value 0,0001) to individual dietary. There is no relationship between attitude (p value 0,215) and activity (p value 0,775) to individual dietary. These mean that education, knowledge, sosioeconomic, personal preference are important factors to managed the individual dietary.

Keywords: Diet, Type 2 DM, factor

1. INTRODUCTION

Diabetes is a complex, chronic illness¹ included group of metabolic diseases characterized by hyperglycemia or increase of the glucose level resulting from defects in insulin secretion, insulin action, or both^{2 3 4 5}. The chronic condition of hyperglycemia is associated with long-term damage, dysfunction, and failure of different organs, especially the eyes, kidneys, nerves, heart, and blood vessels² wich lead to development of disabling and life-threatening health complication⁴. In many cases unthreatening gangren lead to amputation of part of body⁵. Thats why it is called as a silent killer⁵.

Cases of diabetes tend to increase in the world, either in Indonesia. The amount of people with Diabetes Mellitus (DM) in 2017 reached 424.9 million cases⁴ which is much higher than in 2015 which amounted to 387 million people³ and is estimated to increase to 628.6 million people in 2045⁴. Indonesia is the 6th country with DM patients, 10.3 million cases

in 2017⁴. It's higher rank than before in 2014, 7th country with total number 8,7 million cases³. The prevalence of DM in Indonesia tends to increase to almost 100%, 1,1% in 2011 to 2,1% in 2013⁶. At ages above 15 years, in 2018 the prevalence of DM reaches 8.5% if it use the consensus of the Indonesian endocrinology association in 2011, and use the consensus of the Indonesian endocrinology association 2015, it still reaches 10.9%⁷.

Type 2 diabetes as the most common type of diabetes, is the result of insulin resistance⁴. Although specific etiologies are not known, Insulin resistance mostly occurs due to overweight or obesity and lack of physical activity and aging^{1 5 8 9}. Women with gestational DM, in those with hypertension or dyslipidemia are frequently occurs¹. Other associated factor is a strong genetic predisposition or family history in first-degree relatives¹. Someone who has a family history of type 2 DM has a risk of developing DM 25 times compared to those who do not have a family history of type 2 DM¹⁰. Other condition such as stress and hypertension history are related too⁹.

Actually the incident of DM on people with high risk can reduce or prevented by intensive lifestyle modification. Study shows that the incident of diabetes was reduce by 58 percent with lifestyle intervention including healthy diet¹¹. People at risk should pay more attention to and maintain their diet, especially for individuals who have a family history of type 2 DM and individuals who have a habit of consuming foods high in fat and sugar⁶. Unhealthy diet, for instance consuming high sugar or carbohydrate¹⁰ and poor fiber increased the risk of prediabetic and type 2 diabetes¹². Unhealthy diet tend to rise the risk of DM type 10 times compare to healthy diet¹⁰. Study shows that carbohydrate intake, total calorie intake, fiber, glycemic load, duration and frequency of physical exercise affect 69.7% blood sugar levels. Sadly, people did not realize the risk. The availability of fast food restaurants makes people tend to choose these foods because it feels more practical than trying to find healthy food¹⁰. It's not only happened to adult people. For the younger people in high school, the consumption of junk food contribute to overload of personal dietary like total calories, carbohydrate, protein, and fat intake which associated with body mass index that contributed to obesity¹³.

2. MATERIALS AND METHOD

This study used primary data source. The data were collected directly with questionnaire. It consisted of three parts: personal identity, three days food recall, and related factor such as personal preference, attitude and knowledge.

The Sample taken with proportional cluster random sampling. There were 52 respondents taken from 7 cluster in Kesugihan district. First, we choose the cluster. Then, the following step is identified persons with genetic history using data source of 1st Kesugihan Public

health. Persons who have parents with type 2 DM took randomly from each cluster. Nutry survey used to process the three days foods recall of individual dietary. To identify the correlation of the related factor and individual dietary, we analized the data with Spearman's rank analisys and to analyze the most related factor we used regresi linier degree relatives¹. Someone who has a family history of type 2 DM has a risk of developing DM 25 times compared to those who do not have a family history of type 2 DM¹⁰. Other condition such as stress and hypertention hystory are related too⁹.

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3. RESULTS AND DISCUSSION

Lifestyle modification including individual dietary has an important roles to maintenance glucose level in diabetes¹⁶ and to prevent diabetes¹¹. Amount of glicemic load, total calories, carbohydrate and fiber intake associated with fasting and post pandrial glicemic level¹⁶. In other study, it shows that glicemic indeks and glicemic load associated with glucose level maintenance of patien with type 2 diabetes¹⁷. Other study shows that dietary fiber is related to fasting glucose level eventhough there are no relation between amount of total callories and carbohydrate¹⁸.

Tabel 2. Corellation of Knowledge and personal dietary of person with type 2 genetical history

	Personal Dietary						Total	P value
	Less		Match		More			
	f	%	f	%	f	%		
High	2	11,1	6	33,3	10	55,6	18	
Midle	5	20	14	56	6	24	25	
Low	8	88,9	1	11,1	0	0	9	
Total	15		21		16		52	

The Individual dietary in this study described as amount of the total calories in daily. It took by average of three days food recalling. Another factor of the dietary is similar, like the habits to eat fried food, eat less vegetable and fruit. The correlation within each factor and personal dietary was described on Table 1–7¹⁹.

Education is one of many factors that contributes to human health state. Education itself produces benefits by supporting human capital in developing a range of skills and traits, such as cognitive skills, problem solving ability, learned effectiveness, and personal control²⁰.

Cognitive skill contributes in personal ability to understanding the information about health. However, some studies show that educational state does not related to DM occurrence^{9 21}. The study shows that education related to personal dietary. A person with higher education level is tend to consume more calories. It's describe on Table 1 that 50% of respondent with lower level education took less calories. In contrast, respondent with middle and higher level education, 42% and 50% they took more calories. The p values shows that statistically there are relationship of education to personal dietary.

Knowledge of nutrition is the basis for determining food consumption. Individuals who have good knowledge will have the ability to apply their nutritional knowledge in the selection and processing of food, so that food consumption is sufficient. Miss understood of appropriate nutrition can lead to obesity. Obesity lead us to risk of type 2 DM²¹. The unexpected finding of this study could be explain by the instrument of the study used. The questioner consists of general knowledge nutrition like the ingredient of the nutrition but it is not include the amount of calories, indeks glikemik and glikemik load of the nutrition. Recognizing the nutrition ingredients of the food without realizing the amount of calories included, made them consuming more. Knowledge of the amount of carbohydrate or glucose, calories, fibre, protein and fat of the food will lead us to be more concern to consume it.

Tabel 3. Corellation of Attitude and personal dietary of person with type 2 genetical history

	DietaryPersonal Dietary							
	Less		Match		More		Total	
	f	%	f	%	f	%	f	%
Good	7	38,9	7	38,9	4	22,2	18	
Midle	8	23,5	14	41,2	12	35,3	34	0,215
Total	15		21		16		52	

Attitude and kind of activity did not related with the personal dietary. Table 3 shows that the personal dietary less diferent on the good or midle attitude. On table 4, we found that, there are no significant relation on activity and personal dietary.

Tabel 4. Corellation of Activity and personal dietary of person with type 2 genetical history

	DietaryPersonal Dietary							
	Less		Match		More		Total	
	f	%	f	%	f	%	f	%
Light	10	40	7	28	8	32	25	0,755
Midle	0	0	6	60	4	40	10	0,755
Heavy	5	29,4	8	47,1	4	23,5	17	0,755
Total	15		21		16		52	

Many research identified that sosio-economic .have big contributon to diet pattern. Someone with high economical state has more chance to choose the food they prefer. Although all food ingredients are available on the market, someone with high purchasing power have bigger opportunity to fulfill the food need. In many cases, people tend to consume over nutrition. In fact, increasing of the foodcourt providing fast food, contribute in consuming more calories, carbohidrat and fat that lead to obbesity¹⁰.

Table 5 presents that people with high sosioeconomic tend to took more calorises, (59,3%). In the opposite, people with low sosioeconimic tend to took less calories. The p value shows there is significant relation of sosioeconomic and personal dietary even though it does not mean lead to risk of DM.

Tabel 5. Corellation of sosioeconomical and personal dietary of person with type 2 genetical history

	Personal Dietary						Total	P value
	Less		Match		More			
	f	%	f	%	f	%	f	
Low	15	60	10	40	0	0	25	0,0001
High	0	0	11	40,7	16	59,3	27	
Total	15		21		16		52	

Healthy personal preference lead to good personal dietary. This study found that personal preference have significant relation with personal dietary. It could be seen on table 6. It shows that healty personal preference tend to match calories consumptionUnhealty personal preference tends to consume less calories.

Tabel 6. Corellation of personal preference and personal dietary of person with type 2 genetical history

	Dietary				Personal Dietary		Total	
	Less		Match		More			
	f	%	f	%	f	%	f	%
Healty	4	11,8	17	50	13	28,2	34	0,001
Risk	11	61,1	4	22,2	3	16,7	18	0,001
Total	15		21		16		52	0,001

From the explanation above, there are 4 factors related to personal dietary. To identify the most related factor to personal dietary, it used ordinal multiregression. Based on the tables bellow, we can analyze the relation of those factors.

Model Fitting Information				
Model	-2 Log Likelihood	Chi-Square	df	Sig.
Intercept Only	93.754			
Final	.000	93.754	6	.000

function: Logit

In Likelihood's **Model** -2log Fitting Information explains that without entering an intercept only the value is 93,754. However, by entering the independent variable into the (final) model, there is a decrease in value to 000. The change in value is a chi-square value of 93,754 and is significant at the 5% level (sig.0.00)

Goodness-of-Fit			
	Chi-Square	df	Sig.
Pearson	14.815	32	.996
Deviance	15.229	32	.995

function: Logit

The Goodness of Fit table shows the suitability test of the model with the data. Pearson value is 14.815 with a significance of 0,996 ($> 0,05$) and Deviance of 15.229 with a significance of 0,995 ($> 0,05$). This means that the model matches the empirical data or the model is practicable to use. The Pseudo R-Square table shows that the size of the independent variable (education, knowledge, sosioeconomi and personal preference) is be able to explain the independent variable (personal dietary). This value is like the determination coefficient in regression. Cox and Snell values were 0.835 (83,5%) and Nagelkerke were 0.942 (94,2%)

Parameter Estimates					
Variabel	Esti mate	Wald	Sig.	95% CI	
				Lower	Upper
[pers_diet = 1,00]	-36.90	.006	.940	-1002.69	928.88
[pers_diet = 2,00]	-12.70	.002	.962	-535.45	510.05
[Education=1,00]	-10.57	.002	.968	-533.33	512.18
[Education=2,00]	-10.43	.002	.969	-533.18	512.33
[Education=3,00]	0 ^a	.	.	.	.
[Knowledge=1,00]	-15.02	.004	.949	-478.57	448.53
[Knowledge=2,00]	-2.41	7.460	.006	-4.15	-.68
[Knowledge=3,00]	0 ^a	.	.	.	.
[Sos_Eco=1,00]	-24.22	.007	.934	-599.853	551.40
[Sos_Eco=2,00]	0 ^a	.	.	.	.
[Pers._prefer=1,00]	-.830	.810	.368	-2.64	.977
[Pers.l_prefer=2,00]	0 ^a	.	.	.	.

Link function: Logit.

a. This parameter is set to zero because it is redundant.

Table of Estimate **Parameters** above, note the Wald value and its significance value. Variable achievement value of 7,460 with sig. 0,006 (<0,05) shows that knowledge is the most influencing factors to personal dietary

Test of Parallel Lines ^b				
Model	-2 Log Likelihood	Chi-Square	df	Sig.
Null Hypothesis	.000			
General	.000 ^a	.000	6	1.000

The null hypothesis states that the location parameters (slope coefficients) are the same across response categories.

a. The log-likelihood value is practically zero. There may be a complete separation in the data. The maximum likelihood estimates do not exist.

b. Link function: Logit.

The Test of Parallel Lines table is used to test the assumption that each category has the same parameters or the relationship between independent variables and logit is the same for all logit equations. Since the significance value is 1,000 (> 0.05), then accept H_0 that the resulting model has the same parameters thus, the selection of the link function is appropriate.

4. CONCLUSION

There are significant relation of education, knowledge, sosioeconomic and personal preference to personal dietary. Those all the p value below $\alpha 0,5\%$

There are no significant relation of attitude and activity to personal dietary

Multi Regresi ordinal shows that the most related factor to personal dietary is knowledge.

5. ACKNOWLEDGEMENT

Knowledge is the most related factor to personal dietary. Increasing knowledge that appropriate about prevention and self management of diabets contribute in delay insident of type 2 DM.

Programed life style intervention including programed health education are needed to improve to reduced type 2 DM insident

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