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Analysis of Food Consumption Patterns with the Incidence of Type 2 Diabetes Mellitus in Kulon Progo D.I, Yogyakarta

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Abstract

Diabetes Mellitus Type 2 is a pathophysiological disorder of insulin resistance. Coverage of type 2 diabetes mellitus in Yogyakarta Special Region 2017 (8,321 cases). In Kulon Progo Regency 2016 (1,355 cases), 2017 (1,235 cases), 2018 (1,532 cases). The purpose of the study was to analyze food consumption patterns with the incidence of type 2 diabetes mellitus in the Kulon Progo Regency, a special area of Yogyakarta. The study used a case-control study design. The research sample of 114 respondents was obtained by purposive sampling technique. Data collection techniques are interviews, observation, questionnaire. Data analysis in the study used the Chi-Square test and test logistic regression. The results of the study found that there was an influence on the variable of dietary consumption (p = 0,000) on the incidence of type 2 diabetes mellitus in the Kulon Progo district of Yogyakarta. The most influential variable is the pattern of eating consumption with p = 0,000; EXP (B) / OR = 0.004. So it is necessary to pay attention again to one's lifestyle in terms of diet, increase counseling at all levels of society both who already suffer from diabetes mellitus or do not suffer from diabetes mellitus.

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INTRODUCTION

Diabetes mellitus is a chronic disease that results from a lack of insulin secreted by the pancreas or the body's ineffectiveness in the use of the hormone insulin. diabetes mellitus is quickly becoming one of the most common non-communicable diseases globally. Population growth, population aging, and urbanization with associated lifestyle changes are likely to cause a 55% increase worldwide with diabetes by 2045 (Audina, et al, 2018).

Based on the WHO data in 2013, there was an increase in the prevalence of Diabetes Mellitus from 2007-2013 by 1%. In 2007 the prevalence of Diabetes Mellitus in Indonesia was 1.1%, then in 2013, it had increased by 2.1%. The highest prevalence of diabetes mellitus is in the provinces of DKI Jakarta (3.4%), East Kalimantan (3.3%), Yogyakarta (3.2%), North Sulawesi (3.0%).

In line with research by Suegondo (2015) the World Health Organization (WHO) predicts that there will be an increase in the number of diabetics from 135 million in 1995 to 300 million in 2025. The highest increase is predicted to occur in Asia.

The results of Riskesdas in 2018 stated that an increase in the prevalence of people with Diabetes mellitus was 1.5% in 2013 and increased to 2.0% in 2018, where diabetes mellitus was ranked number four in non-communicable diseases. This certainly can have a negative impact, because diabetes mellitus mostly affects people of productive age. In addition, diabetes mellitus also affects the incidence of new diseases such as heart failure and kidney failure, blindness, blood and nerve disorders, stroke and various other complications (Dinkes DIY, 2018).

Based on data from the Ministry of Health of the Republic of Indonesia in the Special Region of Yogyakarta for Diabetes Mellitus based on examinations in Pukesmas in 2015 as many as (6,931 cases), in 2016 there was an increase of (9,473 cases), in 2017 diabetes mellitus decreased by (8,321 cases), although it has decreased but diabetes mellitus still occupies the top 10 deadly diseases in Indonesia (Ministry of Health Republic of Indonesia. 2018). The presentation of the occurrence of diabetes mellitus that experienced fluctuations was in Kulon Progo district which in 2016 amounted to 1,355 cases, then experienced a decline in 2017 of 1,235 cases, which then increased in 2018 to 1,532 cases from 21 health center located in Kolon Progo Regency (Dinkes District Health Office DIY, 2018).

Then from that, Diabetes Mellitus type 2 is a chronic disease that cannot be cured but has the potential to be prevented and controlled (Puspita, et al, 2011). The increase in prevalence is caused by changes in a person's lifestyle or due to someone consuming unhealthy food. The development of globalization has affected a person's diet which is bad, which is where people consume fast food that has a very high calorie and sugar content, which is very popular as (fast food or junk food).

Diet is a description of the types, quantities, and composition of food eaten every day by a person. Intake of foods containing such as carbohydrates or sugar, protein, fat, and excessive energy which can cause risk factors for the onset of Diabetes Mellitus. The more food consumed, the more likely it will cause the occurrence of Diabetes Mellitus Linder (in Susanti, et al 2018).

Research conducted by Asdinar, (2014), found that there were a majority of respondents having a regular diet of 38 people (70.4%) and most respondents were not at risk of Diabetes Mellitus as many as 37 people (68.5%). The conclusion in this study is that there is a relationship between diet and the risk of Diabetes Mellitus in Caile Health Center, Ujungbulu District, Bulukumba Regency with a value of $\rho < 0.05$.

In addition, most patients with type 2 diabetes mellitus have a poor diet, that is, there is more nutritional status (Obesity), nutrition also affects the occurrence of type 2 diabetes mellitus. Nutritional status is more likely to have high blood glucose levels compared to patients with normal nutritional status. Where there is one way to monitor a person's nutritional status is to measure body mass index, Adamo (in Masruroh, 2018).

Based on research conducted by Wahome et al (2016) explains that nutritional status greatly affects the occurrence of diabetes Mellitus,

because if a person's nutritional status cannot be controlled properly every day, then it is possible to cause obesity, according to the results obtained of this research is the prevalence of high obesity as much (50.9%).

In addition to the nutritional status of other factors that have a major influence on the prevalence of type 2 diabetes mellitus, there are genetic or hereditary factors. This is evident in several studies that have proven that someone who has a family history of suffering from diabetes mellitus is very at greater risk than people who previously had no family history of diabetes mellitus. Research Scott, et al (2014) explain that genetic factors with a family history of type 2 Mellitus diabetes are very large in relation to type 2 diabetes mellitus, compared with genetic factors without a family history of type 2 diabetes mellitus. The conclusion is a relationship between factors genetics with a family history of DM sufferers with type 2 diabetes mellitus. Research conducted by Sudargo, et al (2017). There is a significant relationship between family history of diabetes, frequency of consumption of fried foods with the incidence of Type 2 Diabetes Mellitus.

Based on the results of a preliminary study conducted on March 6, 2019, in three Pukesmas that are included in the order of high Diabetes sufferers from interviews conducted in the head of the field responsible for non-communicable diseases, that there are many people with Diabetes Mellitus in hereditary factors or genetic factors, Diabetes Mellitus is more common in women than men, where almost 90% of Diabetes Mellitus is suffered by women.

Departing from that, Diabetes Mellitus disease is very high experienced by the aged above 20 years, which at that age is influenced by the lifestyle of someone who is very modern, marked by poor food consumption patterns, the residents prefer to consume ready-to-eat foods such as food high in fat, cholesterol, protein, sugar, salt and others. In addition, residents also lack the awareness to maintain their health, as seen from residents who rarely come to the Pukesmas to check the condition of their condition, so that when it is severe, they only come to the Pukesmas to check their condition and the average condition is already at a severe stage. The purpose of this study was to analyze the effect of dietary consumption patterns on the incidence of type 2 diabetes mellitus in the Kulon Progo District of Yogyakarta Special Region.

METHOD

This research was conducted using a case-control study design. The population taken was patients suffering from type 2 diabetes mellitus in Kulon District. The sample in this study were 114 respondents consisting of 57 cases and 57 controls. The sampling technique used is purposive sampling.

The independent variable in this study is the pattern of eating consumption. The dependent variable in this study is the incidence of type 2 diabetes mellitus. Data collection techniques are interviews, observation, and a questionnaire. In this study, univariate, bivariate analysis using the Chi-Square and multivariate tests using logistic regression tests to see the effect on the dependent and independent variables (Dahlan, 2014 & Dahlan 2010).

RESULTS AND DISCUSSION

Effect of Eating Consumption Patterns With Type 2 Diabetes Mellitus Incidence in Kulon Progo D.I Yogyakarta Regency.

The influence of eating patterns with the incidence of type 2 Diabetes Mellitus can be seen from the results of the univariate and bivariate analysis in the following description.

A. Univariate analysis

Univariate analysis is related to food consumption patterns. This analysis will produce frequency distribution and percentage of food consumption patterns with the incidence of type 2 Diabetes Mellitus in Kulon Progo district in July 2019. Based on the results of eating consumption patterns research analysis can be seen in the following description.

Table 1. Distribution of respondents based on food consumption patterns

Food consumption patterns	Frequency of food consumption patterns				Total	
	Cases		Control			
	N	%	N	%	N	%
Baik	3	5.3	52	91.2	55	48.2
Tidak baik	54	94.7	5	8.8	59	51.8
Jumlah	57	100.0	57	100.0	114	100.0

Based on table 1, it is known that of the 57 respondents whose cases, as many as 54 people (94.7%) experienced poor eating patterns, while as many as 3 people (5.3%) experienced good eating patterns. While of the 57 respondents who control, as many as 52 people (91.2%) experienced good eating patterns, while as many as 5 people (8.8%) experienced poor food consumption patterns.

This is in line with the results of Dafriani's research (2017) explaining that respondents who have poor diet more than good eating patterns seen from statistical results where eating patterns are not good as many as 52 respondents (55.9%), and respondents who have mild physical activity higher than those whose heavy activities get results from respondents as many as 49 (52.7%).

In a study conducted by Idris et al (2018) it was found that a diet with blood sugar levels showed that the energy, carbohydrates, and fat intake were significant with a p0.05 value of 0.162. Variable type, sugar and processed products (p> 0.05) is 0.133. While the vegetable and fruit variables are significant with a p-value of 0,000. Dining schedule variable p-value 0.460. The glycemic load itself has a relationship with blood sugar levels as evidenced by the p-value <0.05 which is 0.004.

Foods that are high in glucose content are foods that have high glycemic index values. Where foods with the high glycemic index will be able to raise blood sugar levels quickly, conversely if foods with the low glycemic index will be slower to increase blood sugar levels so consumption of foods that have high glycemic index values in frequency can often trigger diabetes mellitus. . Marine, D & Adiningsih, S. (2015).

Then Waspadji (in Adnan, 2011) shows that people who are accustomed to eating or consuming foods that contain lots of carbohydrates such as biscuits, chocolate and so on can potentially be attacked by diabetes mellitus. Explained by Cheung F.T.'s research et al. (2018) states that if a diet that consumes foods that are high in vegetable, animal and high fat, so it is very high risk for obesity that causes type 2 diabetes mellitus, but if the population has a better diet quality then the chance of developing obesity that causes type 2 diabetes mellitus will be lower.

Based on the description above it can be concluded that a diet that contains a lot of carbon hydrates and less physical activity can cause blood sugar levels in type 2 diabetes mellitus patients.

B. Bivariate Analysis

Bivariate analysis based on testing the relationship between dietary consumption patterns and the incidence of type 2 diabetes mellitus using the Chi-Square test obtained the following results.

Table 2. The relationship of eating patterns with the incidence of type 2 diabetes mellitus

Eating patterns	Frequency				Total		P	OR
	Case		Control					
	n	%	N	%	n	%		
Baik	3	5.3	52	91.2	55	48.2	0.000	0.005
Tidak baik	54	94.7	5	8.8	51	51.8		
Jumlah	57	100.0	57	100.0	114	100.0		

Based on table 2, it is known that from 57 case respondents, 3 people (5.3%) had good eating patterns and 54 people (94.7%) had poor food consumption patterns. Of the 57 control respondents, 52 (91.2%) had good eating patterns and as many as 5 people (8.8%) had poor eating patterns.

Chi-square relationship test results obtained p-value 0,000. The p-value, the date of 0.05 (0.000 <0.05), so that Ho is rejected and Ha is accepted, it means that there is a relationship between eating patterns with the incidence of type 2 diabetes mellitus in the Kulon Progo district community. From the results of the analysis obtained OR value = 0.005, it can be interpreted that someone with a bad eating pattern has a risk of one fold greater cause of type 2 diabetes mellitus compared to people or respondents who have a good dietary pattern with a lower risk of experiencing Type 2 diabetes mellitus.

In accordance with research conducted by Hengky, et al (2018) the incidence of type 2 diabetes mellitus in Andani Makkasau Regional Hospital in *Pare Pare* showed that statistical test results using Chi-Square analysis obtained p-values for the number, schedule and types of food ingredients in a row participate, namely p = 0.004, 0.017, and 0.001 where the value of p <0.05, then Ha is accepted and Ho is rejected so it can be interpreted that there is a relationship between the amount of food, eating schedule and type of food with the incidence of type 2 diabetes mellitus.

In line with Frank & Malik's research, (2011) explains that there is a link between sweet drinks and the risk of developing type 2 diabetes, such as sweet drinks like corn syrup, fruit juices that are high in sugar, sweetened iced tea, lemon ice and there are still some. This study is strengthened by Abidah et al (2016), showing that significant risk factors for diabetes mellitus are gender and age. Men are at risk of diabetes mellitus by 2.48 times. Age more than 50 years at risk of diabetes mellitus by 2.16 times. A diet of sweet, fatty and salty foods is also significantly related to the incidence of diabetes mellitus.

The relationship of eating patterns with the incidence of type 2 diabetes mellitus.The results of 114 samples showed that from the case group that had good consumption patterns as many as 3 people (5.3%) and those who had poor food consumption patterns were 54 people (94.7%), whereas in the control group that had eating patterns were 52 people (91.2%) and 5 people (8.8%) had bad food consumption patterns. Based on the results of the statistical test analysis, obtained OR which is 0.004, it can be interpreted that there is a significant relationship between variable consumption patterns that are not good with the incidence of type 2 diabetes mellitus. With this, it can be concluded that respondents who have bad eating patterns will have a risk of 0.004 times suffering from type 2 diabetes mellitus compared with respondents who have good eating habits.

Then the results of research conducted on respondents who followed prolanis activities carried out in Kulon Progo district in July that the results obtained under a bad diet are higher than a good diet. so it can be concluded that there is a relationship between food consumption patterns with the incidence of type 2 diabetes mellitus with the amount of food consumed by each respondent, thus affecting the incidence of type 2 diabetes mellitus, where this is, because most respondents have the amount of food consumed every day that enters in the category of not good that is (51.8%). Therefore, eating patterns greatly affect the incidence of type 2 diabetes mellitus.

Research by Idris, et al (2014), the results showed that there was a relationship between diet and blood sugar levels of type 2 diabetes mellitus patients, with a p-value <0.05. Another study by O'Connor, et al (2014) explains that there is a relationship between the consumption of sweet milk drinks, sweet drinks such as sweet tea with a higher risk of type 2 diabetes mellitus.

In accordance with the research of Nuraini et al (2016), it was explained that there was a relationship between diet and the incidence of type 2 diabetes mellitus, in line with research Zaroudi, M., et al. (2016) showed that there is a relationship between diet and type 2 diabetes mellitus. So there is a need for more counseling to the public about good and healthy eating patterns. Then confirmed by another study conducted by Mayawati, et al (2017) that there was no relationship between high

glycemic index food intake and physical activity with blood glucose levels in outpatient type 2 diabetes mellitus patients at Karanganyar District Hospital.

Inversely related to research conducted by Rachmawati, et al (2018), explaining that there is no significant relationship between diet and blood sugar levels in patients with type 2 diabetes mellitus, known results from 24 patients, there is a relationship between diet and blood sugar levels 13 patients (54.2%) had low blood sugar levels, 11 patients (45.8%) had high blood sugar levels.

Based on the description above, the common thread that can be drawn is that poor eating patterns can lead to diabetes mellitus 2, compared to good eating patterns, so it has a relationship between poor dietary consumption patterns and good consumption patterns against diabetes mellitus.

CONCLUSION

Based on research that has been carried out, it can be concluded that; There is an influence of consumption patterns with the incidence of type 2 diabetes mellitus in the Kulon Progo district by 0.005 times. Based on Chi-Square Test, the p-volume value is 0,000 <α 0.05, OR = 0.005.

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