



THE INFLUENCE OF HEALTH COUNSELING ON KNOWLEDGE AND ATTITUDE REGARDING HEALTHY DIET IN TYPE II DIABETES MELLITUS PATIENTS IN TOMUAN HEALTH CENTER, PEMATANG SIANTAR CITY IN 2021

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ABSTRACT

Background: Type 2 Diabetes Mellitus (DMT2) constitutes 90% of all DM cases in the world, in Indonesia it has reached more than 16 million people and at the Tomuan Health Center, Pematangsiantar City in April 2021 there were 54 people. **Objectives:** This study aims to determine the effect of health education on knowledge and attitudes about a healthy diet in people with diabetes mellitus type II at the Tomuan Health Center, Pematang Siantar City in 2021. **Method:** This research is a Quasy Experimental type of research with the One Group Pretest Posttest design. The research was conducted at the Tomuan Health Center from October 2021 to March 2022. The sample for this study were 55 people with Type II Diabetes Mellitus. The analysis used the t-paired sample test, which compared data before and after being given counseling, and obtained the mean difference between pre-test and post-test. 95% significance level ($\alpha = 0.05$). **Result:** showed that there were 47 people who experienced an increase in knowledge after treatment, the mean rank was 25.91 and there was an increase in the average attitude before treatment from 19.73 to 30.20 after treatment. The statistical test results for the knowledge variable obtained a p value of 0.000 < 0.05 and for the attitude variable a p value of 0.007 < 0.05. **Conclusion:** The conclusion of this study is that there is an effect of health education on knowledge and attitudes about a healthy diet in people with Diabetes Mellitus Type II at the Tomuan Health Center.

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1. INTRODUCTION

Diabetes mellitus is something that cannot be stated in one clear and concise answer, but in general it can be said as a collection of anatomic and chemical problems which are the result of a

number of factors. In diabetes mellitus, there is absolute or relative insulin deficiency and impaired insulin function. Diabetes mellitus is classified into type 1 DM, type 2 DM, other types of DM, and DM in pregnancy. Type 2 diabetes mellitus (DMT2) is a group of metabolic diseases characterized by hyperglycemia, occurring due to defects in insulin secretion, insulin action or both (1). Diagnosis of Diabetes according to the ADA if the blood sugar examination results: 1) temporary blood sugar level is more or equal to 200 mg/dl, 2) fasting blood sugar level is more or equal to 126 mg/dl, 3) blood sugar level is more or equal to 200 mg/dl at 2 hours after a glucose load of 75 post glucose tolerance test (2).

Diabetes mellitus (DM) is a disease that affects many people in the world (3). The World Health Organization WHO predicts that there will be an increase in the number of people with DM which will become a global health threat. The American Diabetes Association (2019), states that DM is one of the five biggest causes of death. One of the causes of increased complications and mortality is a lack of self-care in DM sufferers (2).

Type 2 Diabetes Mellitus (DMT2) is a case that is often found and accounts for around 90% of all DM cases in the world. The 2020 Centers for Disease Control and Prevention (CDC) report states that as many as 30.3 million people in the United States have DM(4). Reports from the International Diabetes Federation (IDF), predict an increase in the number of DM sufferers in the world from 425 million people in 2017 to 629 million people in 2045. Meanwhile in Southeast Asia, from 82 million in 2017, to 151 million in 2045. Indonesia is the 7th country out of the top 10 countries which are estimated to have a DM sufferer of 5.4 million in 2045 and have low blood sugar level control rates (5).

In line with this, Basic Health Research (Riskesdas) shows a significant increase in the prevalence rate of Diabetes, from 6.9% in 2013 to 8.5% in 2018; so that the estimated number of sufferers in Indonesia reaches more than 16 million people who are then at risk of other diseases, such as: heart attack, stroke, blindness and kidney failure can even cause paralysis and death (6). The results of research in America show that in adulthood, intake calorie average 3200 calories. This amount produces 47% of glucose for the body. Each person has a caloric intake of 1700-1900 calories and a source of calories that produces glucose for the body can reach 70%. (2).

According to data from the Pematang Siantar City Health Office, the incidence of DM disease is relatively high during 2020, namely 2,932 people. The area in Pematang Siantar City, namely in Tomuan District, shows the incidence of Diabetes Mellitus as many as 489 people and increasing every year (7). The high number of people with Diabetes Mellitus is based on increasing symptoms, people who are obese, smokers and with increasing age, and lack of knowledge. The level of education also influences the occurrence of diabetes mellitus because it affects the lack of awareness of health, especially understanding of diabetes. The prevalence of diabetes mellitus which continues to increase will indirectly increase the morbidity and mortality due to diabetes mellitus and complications will occur. (8).

Prevention is intended so that people do not adopt new habits such as consuming fast food and do not like to exercise in a society that can pose a risk to several diseases. Prevention that is a threat to diabetes is primarily primary prevention where this prevention is aimed at groups who have risk factors or those who have not had diabetes mellitus but have the potential to get diabetes mellitus. Prevention of diabetes mellitus includes a healthy lifestyle including eating patterns that must be maintained and regular, physical activity, checking blood sugar levels regularly, and increasing knowledge or education with health education (8)

Knowledge, attitude and behavior are very important factors for changing a person's behavior. Thus, good knowledge and attitudes for a person about diabetes mellitus and its prevention are very important and necessary in shaping a person's behavior in preventing diabetes mellitus.

According to Notoatmodjo, the efforts made must be done to overcome health problems is to improve health education. Health education can result in an increase in individual knowledge and attitudes. Changes in knowledge and attitudes can improve skills in carrying out healthy living behaviors. Notoatmodjo said that changing behavior through education or health promotion does take a long time, but behavior based on adopted knowledge will last longer than behavior that is not based on knowledge (9).

Health education is one of the activities of health education, which is carried out by disseminating health messages or information so that the target is not only aware, knows and understands but is willing and able to implement health behaviors based on the health information they receive. Steps that can be taken to support extension activities to be more effective and efficient are the use of media, where the media can facilitate delivery and clarify the information provided (10).

Based on the results of Harwadi's research (2015) concerning the Effect of Health Education on Diet Compliance in Type 2 DM Patients at Irna Non-Surgery of Internal Medicine at RSUP Dr.M. Djamil Padang using the Wilcoxon test obtained a value of $p = 0.002$ ($p < 0.05$), so it was concluded that there was an effect of health education on adherence to diet in Diabetes Mellitus patients in the Irna Non-Surgery Room Internal Medicine Dr. M. Djamil Hospital Padang (11).

Another study was conducted by Putri (2017) on the Effect of Nutrition Education on Nutrition Knowledge, Attitudes, and Diet in Type 2 Diabetes Patients at the Ciracas District Health Center. The average value of the subject's nutritional knowledge increased from 9.89 during the pre-intervention period to 14.41 after intervention in the form of nutrition education. The results of the paired T-test statistical test showed that there was a significant difference ($p < 0.01$) between the subjects' nutritional knowledge before and after the intervention with nutrition education. The average subject attitude score increased from 26.2 during the pre-intervention to 31.23 during the post-intervention. The results of the paired T-test statistic showed that the attitude of the subject before the intervention was significantly different ($p < 0.01$) from the attitude of the subject after the intervention with nutrition education (12).

The general objective of this research is to find out whether there is an effect of health education on knowledge and attitudes about a healthy diet in people with type II diabetes mellitus at the Tomuan Health Center, Pematang Siantar City in 2021.

2. RESEARCH METHODE

This research is a type of Quasy Experimental research with the One Group Pretest Posttest design. In this design before the treatment is given, the sample is first given a pretest (initial test) and after the experiment the sample is given a posttest (final test). This design is used in accordance with the objectives to be achieved, namely to determine health education on knowledge and attitudes about a healthy diet in people with type II diabetes mellitus. (13) This research was conducted at the Tomuan Health Center, Pematang Siantar City. The time of this research was conducted from October 2021 to May 2022. The population in this study were all patients with Type II Diabetes Mellitus at the Tomuan Health Center, Pematang Siantar City from January to October 2021 with a total of 124 people.

3. RESULT AND ANALYSIS

Characteristics of Respondents

The frequency distribution of the characteristics of respondents at the Tomuan Health Center in Pematang Siantar City can be seen as follows:

Table 1. Frequency Distribution of Respondents Based on Occupation at the Tomuan Health Center, Pematang Siantar City

Karakteristik Responden	Jumlah	
	f	%
Pekerjaan		
Tidak Bekerja	11	20,0
Bekerja	44	80,0
Total	55	100,0
Umur		
Dewasa muda	39	70,9
Dewasa tua	16	29,1
Total	55	100,0
Pendidikan		
Rendah (SD, SMP)	25	45,5
Tinggi (SMA, PT)	30	54,5
Total	55	100,0

Based on Table 1. it can be seen the frequency distribution of 55 respondents based on occupation, 44 respondents (80.0%) working, and 11 respondents (2200%) not working. Based on young adults as many as 39 respondents (70.9%), and old adults as many as 16 respondents (29.1%). Based on low education as many as 25 respondents (45.5%), and higher education as many as 30 respondents (54.5%).

Univariate Analysis Results

Attitude and knowledge pretest results

Table 2. Pretest Distribution of Knowledge and Attitudes About a Healthy Diet in Type II Diabetes Mellitus Patients at Tomuan Health Center, Pematang Siantar City

Pengetahuan Responden	Jumlah	
	f	%
≤ rata-rata	28	50,9
> rata-rata	27	49,1
Total	55	100,0
Sikap Responden	Jumlah	
	f	%
≤ rata-rata	24	43,6
> rata-rata	31	56,4
Total	55	100,0

Based on Table 2. it can be seen the frequency distribution of 55 respondents based on the results of the pretest knowledge ≤ an average of 28 respondents (50.9%), and > an average of 27 respondents (49.1%), based on the results of the pretest attitude ≤ average an average of 24 respondents (43.6%), and > an average of 31 respondents (56.4%).

Knowledge and Attitude Posttest Results

Table 3. Posttest Distribution of Knowledge about Healthy Diet in Patients with Type II Diabetes Mellitus Tomuan Health Center, Pematang Siantar City

Pengetahuan Responden		
≤ rata-rata	27	49,1
> rata-rata	28	50,9
Total	55	100,0
Sikap Responden		
≤ rata-rata	17	30,9
> rata-rata	38	69,1
Total	55	100,0

Based on Table 3, it can be seen the frequency distribution of 55 respondents based on the results of the posttest knowledge ≤ an average of 27 respondents (49.1%), and > an average of 28 respondents (50.9%), the results of the posttest attitude ≤ average as many as 17 respondents (30.9%), and > average as many as 38 respondents (69.1%).

Bivariate Analysis

Bivariate analysis was used to determine the effect between the independent variable and the dependent variable. Bivariate analysis in this study aimed to determine differences in the values of knowledge and attitudes before the intervention and after the intervention using the Wilcoxon test and t-paired sample test which were first analyzed using the normality test. Shapiro-Wilk.

Analysis of Normality Test Effect of Health Education on Knowledge

Table 4. Results of the Shapiro-Wilk Normality Data Test. The effect of health education on knowledge

	Tests of Normality					
	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Pretest Pengetahuan	0,165	55	0,001	0,938	55	0,007
Posttest Pengetahuan	0,124	55	0,036	0,941	55	0,009

a. Lilliefors Significance Correction

Based on the normality test table using the Shapiro Wilk test on knowledge data before health education, it was found that the p-value was $0.0007 < \alpha = 0.05$, after health education it was found that the p-value was $0.009 < \alpha = 0.05$, it can be seen that the data is not normally distributed so the test used is the Wilcoxon test.

Results of Analysis of the Effect of Health Education on Knowledge

Table 5. Results of Knowledge Analysis Before and After Given Treatment to Respondents

Ranks				
		N	Mean Rank	Sum of Ranks
Posttest Pengetahuan - Pretest Pengetahuan	Negative Ranks	2 ^a	3,50	7,00
	Positive Ranks	47 ^b	25,91	1218,00
	Ties	6 ^c		
	Total	55		

Based on table 5 above using the Wilcoxon test, it was found that the negative rank (negative difference) between the pretest and posttest of knowledge was 2 for N meaning that there were 2 people who experienced a decrease in grades after the posttest, the mean value was 3.50 and the sum of rank was 7.00. There were 47 positive ranks (positive difference), meaning that there were 47 people who experienced an increase in knowledge after the posttest, the mean rank or average increase was 25.91, and the total positive rank or sum of rank was 1218.00. The statistical test results obtained a p value of $0.000 < 0.05$ so it can be concluded that there is an effect of health education on knowledge about a healthy diet in people with Type II Diabetes Mellitus at the Tomuan Health Center, Pematang Siantar City.

Analysis of Normality Tests The Influence of Health Education on Attitudes

Table 6. Results of the Shapiro-Wilk Normality Data Test The Effect of Health Education on Attitudes

	Tests of Normality					
	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Pretest Sikap	0,140	55	0,009	0,964	55	0,094
Posttest Sikap	0,073	55	0,200	0,981	55	0,538

a. Lilliefors Significance Correction

Based on the normality test table using the Shapiro Wilk test on attitude data before health education, it was found that $p\text{-value} = 0.094 > \alpha = 0.05$, after health education it was found that $p\text{-value} = 0.538 > \alpha = 0.05$, it can be seen that the data is normally distributed so that the requirements for using the t-paired sample test are met.

Results of Analysis of the Effect of Health Education on Attitudes

Table 7. Results of Attitude Analysis Before and After Given Treatment to Respondents

Perlakuan	Mean	N	Perbedaan		SD	SE	<i>p value</i>
			Mean	SD			
Sebelum	19,73	55	0,127	0,336	0,501	0,067	0,007
Sesudah	30,20	55			0,466	0,063	

Based on table 7 above using the t-paired sample test, the average result of the attitude of the respondents before treatment was 19.73 with a standard deviation of 0.501. And after the treatment, the average result was 30.20 with a standard deviation of 0.466. There was an increase in the average before and after treatment was 0.127 with a standard deviation of 0.336. The statistical test results obtained a p value of $0.007 < 0.05$ so it can be concluded that there is an effect of health counseling on attitudes about a healthy diet in people with Type II Diabetes Mellitus at the Tomuan Health Center, Pematang Siantar City.

DISCUSSION

The Effect of Health Education on Knowledge About a Healthy Diet in Type II Diabetes Mellitus Patients at the Tomuan Community Health Center, Pematang Siantar City

The results showed that the negative rank (negative difference) between pretest and posttest knowledge was 2 for N meaning that there were 2 people who experienced a decrease in grades after the posttest, the mean value was 3.50 and the sum of rank was 7.00. There were 47 positive ranks (positive difference), meaning that there were 47 people who experienced an increase in knowledge after the posttest, the mean rank or average increase was 25.91, and the total positive rank or sum of rank was 1218.00. The statistical test results obtained a p value of 0.000 < 0.05 so it can be concluded that there is an effect of health counseling on knowledge about a healthy diet in people with Type II Diabetes Mellitus at the Tomuan Health Center, Pematang Siantar City.

Based on the results of the pretest, it is known that the knowledge of respondents before being given health education was more in the category of knowledge less than the average of 28 respondents (50.9%), and less in the category of more than the average of 27 respondents (49.1%) with the average value is 7.20. Based on the results of the posttest, it can be seen that in general the knowledge of respondents after receiving health education has increased. This can be seen from the results of the posttest, it is known that the knowledge of respondents after being given health education was more in the category of attitudes, knowledge was more than the average of 28 respondents (50.9%), and less in the category of less than the average, as many as 27 respondents (49, 1%) with an average value of 9.51.

The results of this study are in line with the opinion of Pratama (2016) which increases after providing counseling on knowledge. This is shown in the results of his research that there is a difference in the average level of knowledge in DM sufferers in managing the DM diet before and after being given health education indicating that there is an increase in previous knowledge. 10.91 respondents to 15.06 respondents. Based on the results of hypothesis testing using the Wilcoxon test shows a sig value of 0.000. (14)

The success of counseling goals according to Yeshinta's theory in Decroli (2019) which affects the achievement of counseling, one of which is the level of education. The results obtained in the study showed that the majority of respondents had high school education as many as 13 people (43.3%), these results triggered the success of counseling about physical exercise in patients DM. The effect of counseling about physical exercise on knowledge in type II diabetes mellitus patients at PKU Muhammadiyah Hospital, Yogyakarta. Counseling is a dynamic process that facilitates learning activities and changes in behavior related to individual, family and community health problems so that the ability to overcome their own problems increases. Health workers in carrying out health education activities must be able to apply two concepts, namely communication and the concept of the material provided. The expected results in this health education are changes in knowledge, attitudes and behavior of individuals, families and communities to be able to instill the principles of healthy living in daily health to achieve optimal health status.(1) According to Notoatmodjo (2018)) the success of an extension education can be measured by measuring attitudes or changes in attitudes from the respondents themselves (9)

According to the researchers' assumptions, there is an effect of health education on the knowledge of DM sufferers about the DM diet. One that is related to a person's diet is knowledge. Some respondents have low education, low education greatly affects a person's knowledge. Patients who have better knowledge are able to control themselves in overcoming the problems they face, are able to find information that is important for their health. For example, a diet for diabetics. Because of that, according to the researchers, it is necessary to conduct health education

about diet for diabetics to increase the knowledge of respondents. And after counseling there is an increase in respondents' knowledge about diet in people with type II DM.

The Effect of Health Education on Attitudes About a Healthy Diet in Type II Diabetes Mellitus Patients at the Tomuan Community Health Center, Pematang Siantar City

Based on the results of the study, it was found that the average attitude of the respondents before being treated was 19.73 with a standard deviation of 0.501. And after the treatment, the results obtained were an average of 30.20 with a standard deviation of 0.466. There was an increase in the average before and after treatment was 0.127 with a standard deviation of 0.336. The statistical test results obtained a p value of 0.007 < 0.05 so it can be concluded that there is an effect of health education on attitudes about a healthy diet in sufferers.

Based on the results of the pretest, it is known that the attitude of the respondents before being given health education was less in the less than average attitude category of 24 respondents (43.6%), and more in the more than average category of 31 respondents (56.4%) with an average score -average 19.73. Based on the results of the posttest, it can be seen that in general the attitude of the respondents after receiving health education has increased. This can be seen from the results of the posttest, it is known that the attitude of the respondents after being given health education was more in the category of more than average attitudes of 38 respondents (69.1%), and fewer in the category of less than the average of 17 respondents (30.9 %) with an average value of 30.20.

The results of this study are in line with Kaluku's study (2020) concerning the Effect of Nutrition Education on Knowledge and Attitudes of Type II Diabetes Mellitus Patients. This type of research is a pure experiment with a pre-test and post-test research design in the control and treatment groups. In this design, the grouping of sample members is done randomly. The assessment was carried out before and after the intervention. The results showed that there were differences in knowledge between before and after nutrition education with a p value < 0.05, there was an effect of education on attitudes in this case dietary compliance and blood glucose levels in Type II Diabetes Mellitus patients with a p value < 0.05 (13).

Insulin resistance in type 2 DM is accompanied by decreased intra-cell reactions, thus insulin becomes ineffective in stimulating glucose uptake by tissues. To overcome insulin resistance and prevent its formation in the blood there must be an increase in secreted insulin. In type 2 DM the cells are unable to To compensate for the increased need for insulin, glucose levels will increase which will eventually lead to the problem of nonketotic hyperosmolar hyperglycemic syndrome which causes symptoms of hunger, fatigue, irritability, polyuria, polydipsia, infection and blurred vision. (26)

Provision of regular health education with simple material, appropriate methods, adequate material providers and appropriate time for the respondent who will carry out rehabilitation can increase the respondent's knowledge. Providing joint health education about activities that can be carried out by respondents in a simple and easy to read way to add insight and information about the Diabetes Mellitus diet so as to increase patient compliance in managing the diet and change behavior and lifestyle so as to prevent complications. The nurse's role is very important in facilitating patient health in general including identifying risk factors, providing counselling, providing health education and negotiating behavioral goals and arranging follow-up. (15)

According to the researchers' assumptions, health education given to respondents can improve the attitude of Diabetes Mellitus patients in carrying out diet management. This is in accordance with Pender's statement which explains that interventions can influence health behavior and increase attitude change which has the aim of strengthening and building success in behavior.

Thus when the right attitude about diet is implemented it can bring blood sugar close to normal and prevent further complications.

4. CONCLUSION

The conclusion of this study is that there is an effect of health education on knowledge and attitudes about a healthy diet in people with Type II Diabetes Mellitus at the Tomuan Health Center. It is expected that DM sufferers routinely attend health education to increase their knowledge about a healthy diet in Type II Diabetes Mellitus sufferers.

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