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The Effect of Nutrition Education on Knowledge, Diet and Blood Glucose Levels of Type 2 Diabetes Mellitus Patients, Mataram City Hospital and NTB Province

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Abstract

The phenomenon of diabetes mellitus from year to year an increasing number. One major factor is the lack of knowledge in conducting therapy in patients with diabetes mellitus diit so may lead to increased blood sugar levels. The aim of this study was to determine the effect of nutrition education to increase the knowledge, dietary compliance and uncontrolled blood sugar levels Type 2 Diabetes Mellitus Outpatient in Kota Mataram Dg Provinsi NTB Public Hospital Jeneponto. The design of this research was experimental studies with pre-experimental designs One Group Pretest and Posttest Design. Sampling was conducted using purposive sampling technique with a sample of 30 people. Data was collected by the secondary data and primary data. The dietary pattern data was collected by 24 hours recall questionnaire; blood glucose level of patients was measured by blood glucose meter. While the knowledge of patients was collected by interview using questionnaire. Given before and after the education. Height and weight of patients were measured by scale and microtoice. The secondary data are the description of hospital and laboratory result data obtained from the hospital. Data analysis was performed by Mc Nemar test. The results showed, after education, knowledge of patients categorized sufficiently increased (p = 0.031), from 33.3% to 53.3%, as well as the diet of patients (p = 0.003), from 23.3% to 60, 0% categorized fairly, as well as the patient's blood sugar levels were controlled (p = 0.000), from 3.3% to 46.7%. It is recommended to patients to better manage diet to control blood sugar levels with the help of physical activity and obedient in taking the drug.

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1. INTRODUCTION

Many problems occur in improving the level of public health due to unhealthy lifestyles. The bad news is that an unhealthy lifestyle leads to the emergence of various metabolic diseases and makes it increasingly difficult to treat these diseases. One classic example that is a scourge on society in this lifestyle is Diabetes Mellitus. This means an increasingly heavy burden that is challenging the health service system in this country. The problem is the low quality of life of the world's human resources, especially Indonesia, which results in more time lost at work, lower quality of rest time, and even leads to low life expectancy. Global prevalence: the number of diabetes cases worldwide in 2000 among adults (20 years) is estimated at 171 million and will increase to 366 million by 2030. In terms of ranking of countries for T2DM prevalence, Ukraine (3.2 million) is at the bottom of the list, Pakistan (5.2 million) comes at number six, China is second with 20.8 million people and India has the highest number (31.7 million) of people with a 3% rate for T2DM. The Pima Indians of Arizona in the United States (US) and have the highest prevalence rate

(21%) of T2DM.

The prevalence of diabetes mellitus sufferers in South Sulawesi is 4.6%. Apart from that, it is known that the prevalence of DM and IGT is higher in those who are overweight or obese, there are also respondents who are centrally obese. Added by the PERSI Data and Informatics Center (2017)4 based on the results of epidemiological research, the increase in DM prevalence in South Sulawesi, especially Makassar, increased from 1.5% in 1981 to 2.9% in 1998, and 12.5% in 2015.

Diabetes Mellitus sufferers in 2008 reached up to 5.70%, while in 2009 it increased to 6.63% and in 2010 it also increased to 7.19%. From these data, it shows that diabetes mellitus sufferers increase every year in Jeneponto Regency. From the data obtained above, it can be seen that the prevalence of diabetes mellitus is getting higher, both in developed countries and in developing countries, especially in Indonesia. An unhealthy lifestyle is one of the factors in the occurrence of type 2 diabetes mellitus, especially the pattern of unhealthy eating and lack of knowledge about DM. Both of these factors can cause an increase in blood glucose. This study aims to determine the effect of nutritional education on the level of knowledge, eating patterns and blood glucose levels in type 2 DM patients at RSU Mataram City in NTB Province.

2. MATERIALS AND METHOD

a. Research sites

This research was carried out at the Mataram City General Hospital in NTB Province for the reason that this hospital receives a high number of new patients visits every month. In January, the average patient was 33 people. The research was carried out from May to June 2022.

b. Research Design and Variables

The type of research is a pre-experimental study with a one group pre-test and post-test design. In this design, there is no comparison group (control), but a first observation (pre-test) is carried out which allows researchers to determine any changes in knowledge, eating patterns and blood sugar levels after being given education. The variables in this study are nutritional education, knowledge, and eating patterns, as independent variables, and the patient's blood sugar level as the dependent variable.

c. Population and Sample

The population is all Diabetes Mellitus patients who came for treatment at the Mataram City General Hospital in NTB Province from May to June 2022. Meanwhile, the sample was 30 outpatients in the general polyclinic, taken using a purposive sampling technique, namely sampling. from all subjects who come and meet the research criteria until the required sample size is met. These criteria are as follows: DM patients who visit the hospital in May-June, do not experience complications that affect eating patterns, are conscious, and are willing to be sampled.

d. Data collection

The data collected includes primary data and secondary data. Primary data includes identity, characteristics, consumption patterns, blood sugar levels, patient knowledge, and anthropometry. Consumption pattern data was obtained through a 24-hour recall questionnaire. Data on patient blood sugar levels is measured using a blood sugar meter. Meanwhile, patient knowledge is obtained through interviews using questionnaires, which are given before and after education. Anthropometrics, namely patient TB and BB data, are carried out using stepping scales and microtoices. For secondary data, namely a general description of the hospital, and laboratory data

obtained from the hospital itself. The research was conducted for 61 days. Each respondent was given a post-test after 21 days of education.

e. Data analysis

The research data obtained by observation and interviews were then processed manually and using the Nutri survey program, Microsoft Excel and SPSS using the McNemar test, to determine the differences between two samples at a significant level of $p < 0.05$.

3. RESULTS AND DISCUSSION

1. Results

At Mataram City General Hospital in NTB Province in the last 3 months (January-March) in 2021 there were 146 DM patient visits, namely an average of 30/month. In treating Diabetes Mellitus at this hospital, Health Education is carried out regarding education on drug use, but no nutrition education. Based on the information obtained, patients are treated like normal patients, namely only blood sugar is controlled and then medication is given.

a. Sample Characteristics

The majority of respondents were female, namely 26 respondents (86.7%). Based on age group, the most patients were in the 56–65-year age group, namely 9 respondents (30.0%), and the fewest were in the 66–75-year age group, namely 5 respondents (16.7%). Meanwhile, for the occupational group, most patients worked as housewives, namely 16 respondents (53.3%). Based on education level, the largest number of patients were in the group with basic education levels (SD and SMP), totaling 21 respondents (70.0%). Furthermore, based on the length of time they have suffered from the disease, it was found that the largest number of patients were in the <5 years group, namely 22 respondents (73.3%).

b. Knowledge

The pre-test results (before being given education) showed that 10 respondents (33.3%) were in the sufficient knowledge category, and 20 respondents (66.7%) were in the insufficient category. Then, after the post-test was carried out, there was an increase, namely 16 respondents (53.3%) were in the sufficient category, and 14 people (46.7%) were in the poor category.

c. Dietary habit

Based on the pre-test results, it was found that diet patterns based on the DQS (Diet Quality Score) before being given education, as many as 7 respondents (23.3%) were in the sufficient category, and as many as 23 respondents (76.7%) were in the inadequate category. Furthermore, after carrying out the post-test, it was found that the number increased in the sufficient category, namely 18 respondents (60.0%), and the number decreased in the insufficient category, namely 12 respondents (40.0%).

d. Blood Sugar Levels

The pre-test results showed that there was 1 respondent (3.3%) whose blood sugar was controlled and 29 respondents (96.7%) who did not. However, after the post-test was carried out, there was an increase in the number of respondents whose blood sugar levels were controlled, namely 14 respondents (46.7%), and those who were not controlled, decreased to 16 respondents (53.3%).

2. Discussion

a. The Influence of Nutrition Education on Knowledge

Bivariate analysis with the McNemar test obtained a value of p = 0.031 (p < 0.05). This means that there is an influence of nutrition education on respondents' knowledge. This is supported by research by Aghamolaei (2005) which shows improvement
knowledge after providing education to the research sample for 4 months (t = -26.55, p =0.000).

If we look at the cross tabulation between knowledge and respondents' blood glucose levels, it was found that before the education was given, there were 20 respondents who had insufficient knowledge, all of whom had uncontrolled blood glucose levels, while of the 10 respondents who had sufficient knowledge, there were 9 of them who also had uncontrolled blood glucose levels. their blood is not controlled. However, after education, the number of respondents, both with insufficient and sufficient knowledge, who had controlled blood glucose levels experienced a significant increase

Table 1. Distribution of Respondents Based on Blood Glucose Levels and Knowledge at Time *pre-test* and post-test

Pengetahuan		Kadar Glukosa darah				Total	
		Terkontrol		Tidak Terkontrol			
		n	%	n	%	n= 30	%
Sebelum edukasi	Kurang	0	0	20	100	20	66,7
	Cukup	1	10,0	9	90,0	10	30,0
Sesudah edukasi	Kurang	6	42,8	8	57,1	14	46,7
	Cukup	8	50,0	8	50,0	16	53,3

This is in line with the results of research by Philips (in Rusimah, 2010) which reported that type 2 DM patients who were given integrated counseling for two years showed an increase in knowledge scores (58%) and improved blood sugar levels (34%) compared to before the counseling was given.

Low levels of nutritional knowledge can result in an indifferent attitude towards the use of certain food ingredients, even though these food ingredients are quite available and contain nutrients. Each individual's nutritional knowledge is usually obtained from experience from various sources. For example, mass media or print media, electronic media, and guidebooks from close relatives. This knowledge can be increased by forming confidence in oneself so that a person can behave in accordance with everyday life.

Sufferers' knowledge about DM is a tool that helps sufferers manage diabetes throughout their lives. Thus, the more and better the sufferer understands about his illness, the more he will understand how to change his behavior and why this is necessary.

b. The Effect of Nutrition Education on Eating Patterns

The results of bivariate analysis using the Mc Nemar test showed that "There is an influence of nutritional education on eating patterns". This is shown by the p

value obtained, namely 0.003. Before being given education, there were 7 respondents (23.3%) with an adequate diet based on the DQS, and 23 respondents (76.7%) with an inadequate diet. However, after being provided with education, the number of respondents with an adequate diet increased to 18 respondents (53.3%), and those who were inadequate decreased to 12 respondents (46.7%).

Meanwhile, for food variations, 96.6% of respondents with varying criteria were found to suffer from diabetes mellitus. From this we can see that there is a tendency for respondents who vary their protein sources to be less at risk of suffering from DM. The same thing was also found in the balance of macronutrient ratios (carbohydrate: protein: fat), as many as 95.8% of respondents with a poor macronutrient ratio suffering from DM, while for a good fatty acid ratio as many as 95.8% of respondents suffered from metabolic syndrome. Food frequency can also describe the respondent's food consumption habits. For the frequency of staple foods or main carbohydrate sources, all respondents consumed rice more than once per day.

c. The Effect of Nutrition Education on Blood Sugar Levels

Based on the results of this study, it is known that there is an effect of education on controlling blood glucose levels. The McNemar test results produce a value of p = 0.000. These results are in line with the research results of Norris (2002)9, who said that education is important in treating diabetes mellitus patients. The research results show that

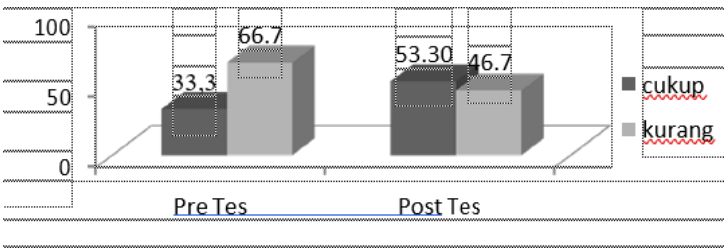

Figure 1. Respondents' knowledge before and after nutrition education

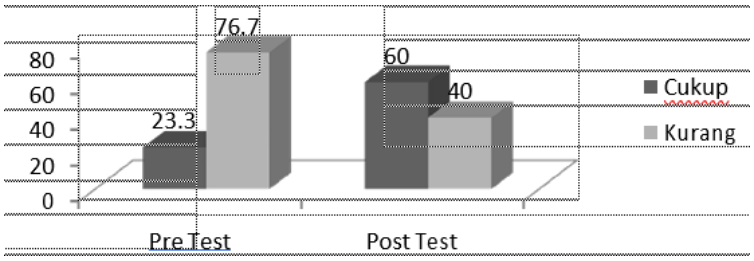

Figure 2. Respondents' eating patterns before and after educationNutrition

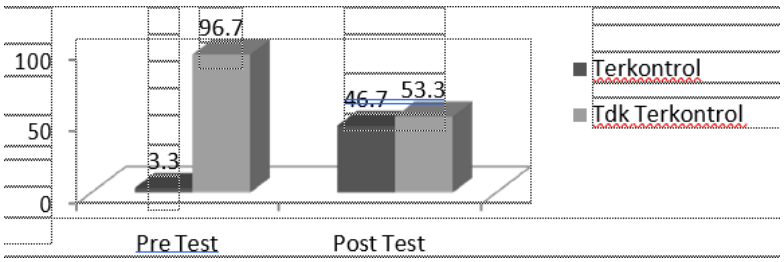

Figure 3. Blood Glucose Levels Before and After Nutrition Education

Providing education can control blood GHb in respondents (0.76%), whereas without providing education GHb is only controlled (0.26%). These results are also in line with research by Suhl and Patricia (2006)10 which shows that adults with diabetes can be treated with nutritional education designed to increase knowledge and abilities for diabetes management. From the case study, the results showed that the HA1c of the respondents before nutrition education was 9.2% and after education it fell to 7.8%. Likewise, research by Sharifirad etall (2009) stated that nutritional education can increase patient knowledge and reduce patients' fasting blood glucose. Fasting blood glucose levels that were given nutritional education and those that were not, had a significant difference in the fasting blood glucose of the two groups and were reduced significantly in the case group compared to the control group ($p<0.001$).

Based on the results of research conducted by Miller CK, et all (2002), the results of measuring GDP levels were obtained. It was found that the mean GDP level of the treatment group was higher than the control group, with the GDP level of the treatment group being 191.93 mg/dl (SD ± 28.23) and the control group 185.97 mg/dl (SD ± 27.12). However, this difference is not statistically significant ($p> 0.05$). The results showed a decrease in GDP levels in the treatment and control groups, respectively by 23.6 mg/dL (SD ± 16.67) and 14.03 mg/dL (SD ± 17.87).

In addition, research results from Husain (2010) showed that in the treatment group there was a significant difference between GDP levels at the beginning and end of the study ($p<0.05$), whereas in the control group it was not statistically different ($p> 0.05$). The results of the analysis of the delta changes in blood glucose levels found a significant difference between the two groups ($p < 0.05$), which shows that the TGM intervention had an effect on controlling the GDP levels of type 2 DM patients. The increase in control of the blood sugar levels of these patients was due to the respondents given a tool in the form of a print-out of DM material containing a meal plan accompanied by a list of exchangers.

4. CONCLUSIONS AND RECOMMENDATIONS

Nutrition education has an effect on increasing knowledge periodically in Diabetes Mellitus patients with a value of $p = 0.031$. Furthermore, the variance value before education is 0.033 and after education is 0.257. Nutrition education can improve eating patterns based on DQS with a value of $p = 0.003$, the variance value before education is 0.230, and after education is 0.257. Nutrition education can also control blood glucose levels ($p = 0.000$), the variance value before education is 0.185, and after education is 0.248. It is recommended for respondents to better regulate their diet, increase physical activity, and explore knowledge about Diabetes Mellitus to control sugar levels. In addition, the hospital is

expected to provide nutritional education for DM sufferers so they can plan their diet twice a week.

5. BIBLIOGRAPHY

Pratiwi, Soleh. Epidemologi Program Penanggulangan dan Issu Mutakhir Diabetes Mellitus.Current Issue. Makassar: Jurusan Epidemologi, FKM UNRAM; 2017.

Gupta, Vipin. Diabetes Mellitus In India. 2012; Tersediadi: http://sancd.org/uploads/pdf/factsheet_diabetes. pdf. Diakses pada 4 Mei, 2021.

Jazilah, dkk. Hubungan Tingkat Pengetahuan, Sikap dan Praktek (PSP) Penderita Diabetes Melitus dengan Kendali Kadar Glukosa Darah, Universitas Gadjah Mada. Jurnal Sains Kesehatan 2003;16 (2); 413-22.

Pusat Data dan Informasi PERSI 2017. Prevalensi Diabetes Mellitus. Tersedia di :http://www.pdpersi.co.id/?show=detailnewes& kode=914&tbl+kesling. Diakses pada 2 Januari, 2021.

Rumah Sakit Umum Daerah Kota Mataram Dg Provinsi NTB. Profil. 2021.

Aghamolaei et al,. Effects of A Health Education Programon Behavior, Hba1c And Health-Related Quality of Life in Diabetic Patients. Acta Medica Iranica 2005;43 (2); 89- 94. Tersedia di: http://journals.tums.ac.ir/upload_files/pdf/_ /741.pdf. Diakses pada 23 April, 2021.

Rusimah.Hubungan Tingkat Pendidikan dan Pengetahuan Gizi dengan Kepatuhan Diet pada Penderita Diabetes Mellitus (Diabetisi) di Ruang Rawat Inap RSUD Siti Hajar Mataram (Skripsi); Sekolah Tinggi Ilmu Kesehatan Mataram;2020.

Chabchoub, Blouza S, et all.The Effect of Nutritional Education on The Food Intake Regulation of The YoungDiabetic,.Tunis Med. Jurnal NCBI, 2000; 78 (10);595-9.

Norris, Susan L., MD, MPH. Self-Management Education for Adults with Type 2 Diabetes A Meta-Analysis of The Effect on Glycemic Control. Diabetes Care, 2002;25 (27):1159–71.

Suhl, Emmy MS, RD, LD, CDE, and Patricia Bonsignore, MS, RN, CDE. Diabetes Self-Management Education for Older Adults: General Principles and Practical Application, Diabetes Spectrum 2006;19(4); 234-40.

Sharifirad,Gholamreza et all.The Effectiveness of Nutritional Education on The Knowledge of Diabetic Patients Using The Health Belief Model.JRMS 2009; 14(1): 1-6, JRMS/ Januari & February 2009; 14(1).

Miller CKet all. Journal :Nutrition Education Improves Metabolic Outcomes Among Older Adults with Diabetes Mellitus: Results from A Randomized Controlled Trial. NCBI, 2002;34(2):252-9. Available at :http://www.google.co.id/url?s a=t&rct=j&q=&esrc=s&source=web&cd=1 ve =0CCQQFjAA&url=http%3A%2F%2Fwww.cbi.nlm.nih.gov%2Fpubmed%2F11817 92 2&ei =lihT5jeK4aIrAfE6NSlBw&usg=AFQjCNFXS lEd5ECu-iYvz2m6iSd6f-rCYA.

Husain, Ahmad A. dkk.Pengendalian Status Gizi, Kadar Glukosa Darah, dan Tekanan Darah melalui Terapi Gizi Medis pada Pasien Diabetes Mellitus (DM) Tipe 2 Rawat Jalandi RSU Mataram NTB1. Jurnal Gizi Klinik Indonesia, 2010; 7(2); 48-57.