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FACTORS RELATED TO COMPLIANCE WITH MEDICAL NUTRITION THERAPY IN DIABETES MELLITUS PATIENTS

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ABSTRACT

Diabetes mellitus is a chronic disease that is increasing over time. The success of treatment and prevention of diabetes mellitus progression is influenced by patient compliance in taking medication and nutritional therapy as an effort to maintain blood glucose levels within the normal range. The aim of this research is to determine the factors associated with compliance with medical nutrition therapy in diabetes mellitus patients. This research is an analytical observational study with a cross sectional approach. This research was conducted from April to October 2023. The research sample was 95 DM patients in the Kalirejo Public Health Center working area., Pesawaran, Lampung. Samples were taken using a purposive sampling technique that met the inclusion and exclusion criteria. Data on knowledge, education, age and income were collected using a questionnaire, as well as data on compliance with medical nutrition therapy was assessed by comparing nutritional intake with the nutritional needs of DM patients based on a 2x24h food recall questionnaire. Data were analyzed using chi square and logistic regression. The results of the study showed that non-compliance with medical nutritional therapy for DM patients was 80%. Knowledge, education, age, and income are related to compliance with medical nutritional therapy for DM patients (p=0.048; p=0.02; p=003; p=0.002). Compliance with medical nutritional therapy for DM patients is very necessary in controlling blood sugar in order to prevent complications.

Keywords: Compliance of Medical Nutrition Therapy, Diabetes Mellitus, Factors Related.

1. INTRODUCTION

Diabetes mellitus (DM) is a collection of symptoms that arise in a person characterized by an increase in blood glucose levels above normal values, which is caused by impaired glucose metabolism due to insulin deficiency, either absolutely or relatively (1).

The results of the Indonesian Basic Health Research in 2018 show that the prevalence of diabetes mellitus in Indonesia based on a doctor's diagnosis at the age of ≥15 years is 2%. This figure shows an increase compared to the prevalence of diabetes mellitus in the population ≥15 years old according to the Indonesian Basic Health Research in 2013 of 1.5%. However, the prevalence of diabetes mellitus requires blood sugar examination results to increase from 6.9% in 2013 to 8.5% in 2018. The figures show that only around 25% of diabetes mellitus patients know that they have diabetes (2).

Steps to improve the Diabetes mellitus diet, patient glycemic control is greatly influenced by patient compliance with medical nutrition therapy (diet) including, the type and amount of food consumed and non-compliance is one of the obstacles to achieving treatment goals and will also result in patients requiring examinations or treatments that are actually not necessary (3).

Compliance with medical nutrition therapy in patients with diabetes mellitus has a very important function, that were maintaining normal body weight, lowering systolic and diastolic blood pressure, lowering blood glucose levels, improving lipid profiles, increasing insulin receptor sensitivity and improving the blood system (4).

The main obstacle in handling medical nutrition therapy for DM

patients is patient boredom in following diet therapy which is actually needed by patients to achieve success in their diet program (3) . Factors that influence the success of medical nutrition therapy/diet in DM patients include age, knowledge, education and income (5).

The patient's knowledge about diabetes mellitus is very necessary in the healing process so that it runs smoothly, someone with high knowledge will be more successful in dealing with problems than those who do not have knowledge in the healing process, so that diabetes mellitus is not controlled and complications occur. If the patient's knowledge is good, the diabetes mellitus patient will be obedient in carrying out the healing process so that diabetes mellitus can be controlled (6).

Knowledge is the result of the process of seeking, knowing, from not knowing to knowing, from not being able to being able for the healing process of diabetes mellitus sufferers in this process of seeking knowledge, includes several methods and concepts, both through the process of education and experience (7).

Education affects the learning process, the higher a person's education the easier it is for that person to receive information. With higher education, a person will tend to get information, both from other people and from the mass media. The more information that comes in, the more knowledge is obtained about health (8).

Knowledge is closely related to a person's education where it is expected that someone with higher education will have wider knowledge. However, it should be emphasized that someone with low education does not necessarily mean someone with low knowledge. This is because increasing knowledge is not absolutely obtained in formal education, but can also be obtained in non-formal education (9).

Age affects a person's comprehension and mindset. The older one gets , the more one's comprehension and mindset will develop , so that the knowledge one gains will improve. Age affects a person's comprehension and mindset. The older one gets, the more one's comprehension and mindset will develop, so that the knowledge one gains will improve (10).

Family income affects compliance with medical nutrition therapy in DM patients. DM patients with low income tend to be lazy and rarely come to health care facilities to control DM disease and get regular education about proper medical nutrition therapy. Low income also contributes to the provision of food for DM patients, making DM patients non-compliant with medical nutrition therapy (11).

The purpose of this study was to analyze the relationship between knowledge, education level, age and income with medical nutrition therapy in patients with diabetes mellitus.

2. METHOD

This type of research is an observational study with a cross-sectional design. The study was conducted in the working area of the Kalirejo Public Health Center in Pesawaran Lampung, from April to October 2023. The case population in this study were all patients with type 2 diabetes mellitus in Lampung province. Based on the results of the sample calculation, the minimum number of samples that must be met is 95 people with type 2 DM.

The sample size calculation uses the sample size formula for unpaired analytical categorical variables with a confidence level of 95%, and a power of the test of 80%. Sampling was carried out using the purposive sampling method. The inclusion criteria for this study sample were patients with

type 2 diabetes aged <60 years, suffering from type 2 diabetes for at least 3 months, with the exclusion criteria of type 2 diabetes with complications. The independent variables in this study were knowledge, education, age and income. The dependent variable in this study is compliance with medical nutrition therapy (MNT) in type 2 DM patients.

Data on knowledge, education, age and income were collected by questionnaires; and data on medical nutrition therapy compliance were assessed by comparing food intake with nutritional needs of type 2 diabetes mellitus patients based on the 2x24h food recall questionnaire.

The data were then tested statistically with a significance level of 95% (p <0.05) using the chi square test. This study was conducted after obtaining a research ethical clearance letter from the Ethics Committee of the Faculty of Medicine, University of Lampung with number 2911 / UN26.18 / PP.05.02.00 / 2023.

3. RESULTS

The results of the study showed that DM patients who were not compliant with medical nutrition therapy were 76 people (80%) and compliant with medical nutrition therapy were 19 people (20%). Knowledge in the poor category was 61 people (64.2%) and good was 34 people (35.8%). Education in the low category was 76 people (80%) and high was 19 people (20%). Age in the category of elderly was 7 people (7,4%) and middle age-adult was 88 people (92,6%). Income in the category of less than RMW (regional minimum wage) was 76 people (80%) and more than RMW was 19 people (20%).

Table 1. Frequency Distribution of Research Variables

Variables	Amount (f)	Percentage (%)
MNT Compliance		
a. No	76	80
b. Yes	19	20
Knowledge		
a. Poor	61	64,2
b. Good	34	35,8
Education		
a. Low	76	80
b. High	19	20
Age		
a. Elderly	7	7,4
b. Middle Age-Adut	88	92,6
Income		
a. Less than RMW	76	80
b. More than RMW	19	20

The results of the study showed that DM patients who had poor knowledge and were not compliant with medical nutrition therapy (86.9%) were greater than DM patients who had good knowledge and were not compliant with medical nutrition therapy (67.6%). Knowledge was related to non-compliance with medical nutrition therapy in DM patients (p = 0.048). Poor of knowledge was a risk factor for non-compliance with medical nutrition therapy in DM patients with OR = 3.1 (95% CI: 1.12-8.9), which means that DM patients who had poor knowledge would be at 3.1 times greater risk of non-compliance with medical nutrition therapy compared to DM patients with good knowledge.

The results of the study showed that DM patients who had low education and were not compliant with medical nutrition therapy (85.5%) were greater than DM patients who had high education and were not compliant with medical nutrition therapy (57.9%). Education was related to non-compliance with medical nutrition therapy in DM patients (p = 0.02). Low of education was a risk factor for non-compliance with medical nutrition

therapy in DM patients with OR = 5.9 (95% CI: 1.41-13.07), which means that DM patients who had low education would be at 5.9 times greater risk of non-compliance with medical nutrition therapy compared to DM patients with high education.

The results of the study showed that DM patients who was middle age-adult people and were not compliant with medical nutrition therapy (84.1%) were greater than DM patients who was elderly people and were not compliant with medical nutrition therapy (28.6%). Age was related to non-compliance with medical nutrition therapy in DM patients (p = 0.003). Middle age and adults people was a risk factor for non-compliance with medical nutrition therapy in DM patients with OR = 13 (95% CI: 0.01-0.43), which means that DM patients who was middle age and adults people would be 13 times more at risk of non-compliance with medical nutrition therapy compared to DM patients who was elderly.

The results of the study showed that DM patients who had income less than regional minimum wage (RMW) and were not compliant with medical nutrition therapy (86.8%) were greater than DM patients who had income more than regional minimum wage (RMW) and were not compliant with medical nutrition therapy (52.6%). Income was related to non-compliance with medical nutrition therapy in DM patients (p = 0.002). Income less than RMW was a risk factor for non-compliance with medical nutrition therapy in DM patients with OR = 5.9 (95% CI: 1.93-18.19), which means that DM patients who had poor knowledge would be at 3.1 times greater risk of non-compliance with medical nutrition therapy compared to DM patients with good knowledge.

Table 2. Relationship between Knowledge, Education, Age and Income with Compliance on Medical Nutrition Therapy in Type 2 DM Patients

Variables	MNT Non-Compliant		MNT Compliance		p value	OR (95% CI)
	f	%	f	%		
Knowledge					0.048	3.1
a. Poor	53	86.9	8	13.1	*	(1.12-8.9)
b. Good	23	67.6	11	32.4		
Education					0.02*	5.9
a. Low	65	85.5	11	14.5		(1.41-13.07)
b. High	11	57.9	8	42.1		
Age					0.003	13
a. Middle Age-Adult	74	84.1	14	15.9	*	(0.01-0.43)
b. Elderly	2	28.6	5	71.4		
Income					0.002	5.9
a. Less than RMW	66	86.8	10	13.2	*	(1.93-18.19)
b. More than RMW	10	52.6	9	47.4		

4. DISCUSSION

One of the steps that can be taken to inhibit and prevent the occurrence of DM complications is through medical nutrition therapy and physical activity with/without pharmacological intervention from antihyperglycemic drugs. Diet therapy is the main therapy that will be carried out in the management of diabetes mellitus (12).

The principles of diet therapy in patients with diabetes mellitus include balanced food with the number of calories according to body condition, the right time to eat and the type of food consumed, especially for patients who use insulin. This diet therapy helps control metabolic, lipid, and blood pressure in the body. The success of medical nutrition therapy in DM patients can be measured using dietary compliance indicators (3).

Dietary compliance is the similarity of individual behavior with recommendations given by health workers related to dietary patterns and certain restrictions. However, in practice, dietary compliance is very difficult to implement (13).

The results of the study showed that knowledge is related to compliance with medical nutrition

therapy in DM patients. Knowledge is a very important factor in the actions of diabetes mellitus patients, behavior based on knowledge will be easier to implement than that not based on knowledge. One way to overcome the effects of diabetes mellitus is by implementing a diabetes mellitus diet, but many diabetes patients are not compliant in implementing the diet. Knowledge is closely related to behavior, because with knowledge patients have a reason or basis for making a decision or choice (14).

Nutritional knowledge is essentially a person's ability to understand concepts and principles and information related to nutrition, food and its relationship to health. Increased knowledge is followed by increased skills and attitudes and activities interact to form a distinctive behavioral pattern (15).

Low levels of knowledge can be an inhibiting factor in compliant behavior in DM patients because patients will have difficulty following the recommendations of health workers (4).

The results of the study showed that the level of education was related to compliance with medical nutrition therapy in DM patients. The level of education is one of the factors that influences compliance with medical nutrition therapy in DM patients (16).

Higher levels of education will cause the knowledge possessed to become broader. The level of individual education affects the ability to understand something new and is also better at motivating oneself so that there is a change in behavior towards the better. In this case, the change in question is compliance in undergoing a diet. This is because education is the main foundation that determines success in undergoing treatment (17).

The level of education will affect the patient's knowledge in using drugs so that it will affect the effectiveness of treatment. The higher the level of education, the better a person's intellect will be so that they will be better or faster in accepting and easily understanding the information provided by the counselor, and have a better mindset towards the disease and therapy they are undergoing (18).

The results of the study showed that age is related to compliance with medical nutrition therapy in DM patients. Middle age and adult people are groups who are still productive in their work and have other priorities in their daily lives, such as work and other commitments that cause patients with this productive age group to be non-compliant in consuming drugs or medical nutrition therapy that has been given or unable to attend routine check-ups to the clinic every month and the busyness of this productive age also causes delays in filling drug prescriptions, so that it will affect their treatment compliance (19).

The results of the study showed that income was related to compliance with medical nutrition therapy in DM patients. Income is related to the family's ability and purchasing power for their needs including the fulfillment of food/meal needs (20) . The availability of diverse food and in accordance with the needs of DM patients in the implementation of medical nutrition therapy according to doctor's recommendations is related to food intake and compliance of DM patients with medical nutrition therapy (21).

5. CONCLUSION

Compliance with medical nutrition therapy in DM patients is very necessary for controlling blood glucose and preventing complications. Many factors are related to compliance with

medical nutrition therapy in DM patients, including knowledge, education, age and income. Periodic and continue education is needed to increase knowledge and awareness of DM patients, especially those in the middle age and adult age groups, with low education and low income, to increase compliance with medical nutrition therapy in DM patients.

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