

THE EFFECT OF FAMILY SUPPORT, HEALTH WORKERS AND FOOD AVAILABILITY ON COMPLIANCE WITH MEDICAL NUTRITION THERAPY IN TYPE 2 DIABETES MELLITUS PATIENTS

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ABSTRACT

The prevalence of diabetes mellitus has increased over time. Patient compliance in taking medication and medical nutrition therapy plays a very important role in the success of treatment to maintain blood glucose levels within the normal range. The purpose of this study was to determine the effect of family support, health workers and food availability on compliance with medical nutrition therapy in patients with type 2 diabetes mellitus. This study is an analytical observational study with a cross-sectional approach. This study was conducted from April to October 2023. The research sample was 95 diabetes mellitus patients in the work area of the Kalirejo Public Health Center in Pesawaran Lampung. The sample was taken using a purposive sampling technique that met the inclusion and exclusion criteria. Data on family support, health workers and food availability were taken using a validated questionnaire, and data on compliance with medical nutrition therapy were assessed by comparing food intake with the nutritional needs of patients based on the 2x24h food recall questionnaire. Data were analyzed using chi square and logistic regression. The results showed that non-compliance with medical nutrition therapy in patients with type 2 diabetes mellitus was 80%. Family support, health workers and food availability are related to compliance with medical nutrition therapy in diabetes mellitus patients ($p < 0.001$; $p = 0.004$; $p = 0.02$). Compliance with medical nutrition therapy in type 2 diabetes mellitus patients is very necessary in controlling blood sugar in order to prevent complications. Family support and health workers play an important role in compliance with medical nutrition therapy in type 2 diabetes mellitus patients.

Keywords : *type 2 diabetes mellitus, family support, health worker support, compliance with medical nutrition therapy, food availability*

1. INTRODUCTION

Diabetes is a chronic, metabolic disease characterized by elevated levels of blood glucose (or blood sugar), which leads over time to serious damage to the heart, blood vessels, eyes, kidneys and nerves. The most common is type 2 diabetes, usually in adults, which occurs when the body becomes resistant to insulin or doesn't make enough insulin. In the past 3 decades the prevalence of type 2 diabetes has risen dramatically in countries of all income levels. About 422 million people worldwide have diabetes, the majority living in low-and middle-income countries, and 1.5 million deaths are directly attributed to diabetes each year. Both the number of cases and the prevalence of diabetes have been steadily increasing over the past few decades (1).

According to WHO, diabetes mellitus (DM) is categorized as one of the non-communicable diseases (NCD) which is the main cause poor

health for the world. Non-Communicable Diseases rank seventh out of the top ten causes of death in the world with a higher prevalence of death in low and middle income countries (2).

Based on the results of the Basic Health Research (RISKESDAS) in 2018, it was stated that Diabetes sufferers in Indonesia experienced a very significant increase, in 2013 the prevalence of DM reached 6.9%, while in 2018 the number continued to soar to 8.5%. Diabetes is the third largest cause of death after stroke and heart disease (3).

Diabetes mellitus consists of two types, that were type I which is caused by heredity and type II which is caused by lifestyle. Almost 80% of the prevalence of DM, the most is Type II Diabetes Mellitus, this means that an unhealthy lifestyle is the main trigger for the increasing prevalence of DM. In addition, sufferers of type II DM often have complications that can cause death (4).

Complications can occur in almost all parts of the body and can cause the risk of premature death overall. Complications that can occur are heart attacks, strokes, kidney failure, leg amputation, loss of vision and nerve damage. Therefore, proper management must be carried out on DM patients to prevent complications that can occur (5).

In the management of diabetes there are two therapies that can be done, that were pharmacological therapy and non-pharmacological therapy. Non-pharmacological therapy includes lifestyle changes with dietary patterns, increasing physical activity related to DM disease (6).

One of the non-pharmacological therapies that can be applied to DM patients is regulating the DM diet/diet, the principle of regulating eating patterns in patients with diabetes is a balanced diet and according to the calorie and nutrient needs of each individual, the importance of regular eating in terms of meal schedules, types and amounts of food especially for patients who use insulin (7,8).

Diet success is greatly influenced by internal and external factors. Internal factors as determinants of diet success include knowledge and attitude. While external factors include family support, social support, food availability and support from health workers (9).

Family support is very influential for DM patients on diet compliance. When a family member experiences health problems, other members play a very important role in nursing problems. Therefore, family support is very important for DM patients in carrying out their compliance with the diet (10,11).

The positive impact of family support in carrying out a diet for DM patients is that they can control what is recommended by health workers in carrying out their diet, can remind each other, and motivate each other between family members, especially for families who are on a diet so that DM patients are motivated to continue their diet and want to maintain or improve their quality of life (12).

Support from health workers has a major impact on the success of the DM patient diet program. Support from officers in increasing public knowledge in dealing with NCDs, one of

which is diabetes mellitus, has proven effective, such as in providing education and health services at the integrated health post (13).

The availability of food in the household also determines the compliance of DM patients' diet. Healthy food and food in accordance with the DM patient's diet available in the household makes it easier for patients to eat according to the DM diet recommended by the doctor (14).

The purpose of this study was to analyze the influence of family support, health workers and food availability on compliance with medical nutrition therapy in patients with type 2 diabetes mellitus in the work area of the Kalirejo Pesawaran Lampung Health Center.

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 family support, health worker support, and food availability. The dependent variable in this study is compliance with medical nutrition therapy (MNT) in type 2 DM patients.

Data on family support, health worker support, and food availability were collected and assessed based on validated 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.

Data collection was carried out by researchers with the help of 2 enumerators who had been given prior direction and training. 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. RESULT

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%). Family support in the category of less was 69 people (72.6%) and good was 26 people (27.4%). Health worker support in the category of less was 75 people (78.9%) and good was 20 people (21.1%). Food availability in the category of less was 76 people (80%) and sufficient was 19 people (20%).

Table 1. Frequency Distribution of Research Variables

Variables	Amount (f)	Percentage (%)
Nutrition Therapy Compliance		
a. No	76	80
b. Yes	19	20
Family Support		
a. Poor	69	72.6
b. Good	26	27.4
Health Workforce Support		
a. Poor	75	78.9
b. Good	20	21.1
Food Availability		
a. Inadequate	76	80
b. Adequate	19	20

The results of the study showed that DM patients who had poor family support and were not compliant with medical nutrition therapy (89.9%) were greater than DM patients who had good family support and were not compliant with medical nutrition therapy (53.8%). Family support influenced non-compliance with medical nutrition therapy in DM patients ($p = 0.000$). Poor of family support was a risk factor for non-compliance with medical nutrition therapy in DM patients with OR = 7.5 (95% CI:

2.53-22.75), which means that DM patients who had poor family support would be at 7.5 times greater risk of non-compliance with medical nutrition therapy compared to DM patients with good family support.

The results of the study showed that DM patients who had poor support from health workers and were not compliant with medical nutrition therapy (86.7%) were greater than DM patients who had good support from health workers and were not compliant with medical nutrition therapy (55%). Health worker support influenced non-compliance with medical nutrition therapy in DM patients ($p = 0.004$). Poor of support from health workers was a risk factor for non-compliance with medical nutrition therapy in DM patients with OR = 5.3 (95% CI: 1.76-16.04), which means that DM patients who had poor support from health workers would be at 5.3 times greater risk of non-compliance with medical nutrition therapy compared to DM patients with good support from health workers.

The results of the study showed that DM patients who had inadequate food availability and were not compliant with medical nutrition therapy (85.5%) were greater than DM patients who had adequate food availability and were not compliant with medical nutrition therapy (57.9%). Food availability affected non-compliance with medical nutrition therapy in DM patients ($p = 0.02$). Inadequate food availability was a risk factor for non-compliance with medical nutrition therapy in DM patients with OR = 4.2 (95% CI: 1.41-13.07), which means that DM patients who had inadequate food availability would be 4.2 times more at risk of non-compliance with medical nutrition therapy compared to DM patients with sufficient food availability.

Table 2. Relationship between Family Support, Health Worker Support and Food Availability with Compliance with Medical Nutrition Therapy in Type 2 DM Patients

Variables	MNT Non-Compliant		MNT Compliance		p value	OR (95% CI)
	f	%	F	%		
Family Support					0,000	7.5 (2.53-22.75)
a. Poor	62	89.9	7	10.1		
b. Good	14	53.8	12	46.2		

Health Workforce Support					0.004	5.3 (1.76-16.04)
a. Poor	65	86.7	10	13.3		
b. Good	11	55	9	45		
Food Availability					0.02	4.2 (1.41-13.07)
a. Inadequate	65	85.5	11	14.5		
b. Adequate	11	57.9	8	42.1		

4. DISCUSSION

Family support can improve dietary compliance in diabetes patients. The presence of family in providing care affects the psychological condition of patients who are experiencing illness (15). Type II DM patients need attention from their families to have the motivation to control their health so that type II DM patients feel strong enough to maintain diet activities (16).

One of the benefits of family support is providing a sense of comfort. This sense of comfort will be felt by sick family members who are supported by other family members (17). The family is an environment of people who can provide great confidence for patients. This sense of confidence will encourage diabetes patients to be compliant with the treatment being carried out (18).

Unmanaged type 2 diabetes mellitus will cause complications, so to prevent these complications, the role of the family is needed to provide support for the implementation of the diet, the implementation of the diet can be done with meal planning. Family support can be done during the prevention stage, treatment or during rehabilitation (healing) (9).

Diabetics need to be given support by the family in the form of information, emotions, appreciation and also instrumental where the encouragement will affect their psyche, so that it will encourage their physical to do something that will be achieved, that was health. In humans, there is a desire and desire to do something, but to do that action, there needs to be internal encouragement (encouragement from oneself) and also external encouragement such as circumstances, a supportive environment and also support from others (19).

Diabetic patients need support in their care to manage their disease. Diabetes makes a person need increased support. Family support

was found to be significantly correlated with functional status, where body function improves with adequate support (or diabetes health status and increased self-care (20).

The role of family support in compliance and other health behaviors and found that family support was significantly related to positive health behaviors by complying with health activities (21).

Family support has a positive effect on overall psychosocial health. In this regard, health service interventions must involve family support. The greater the family support received, the better the psychosocial adaptation to the disease (22).

Providing adequate family support has a positive effect on decreasing levels of salivary catecholamines and cortisol. With these findings, it means that providing family support reduces hormones that cause stressful situations (23).

Patients do not comply with the diet due to a lack of self-confidence in the patient's eating arrangements at home and eating habits in the family that do not comply with the recommended diet (9).

Family involvement in the care of diabetes patients will be able to protect patients from Diabetes patients will get positive feelings and experiences that life can run stably if they get support from their surroundings (24).

Family support for DM patients in this study was in the form of family/partner assistance when consulting a doctor, monitoring the food consumed, and helping to provide food according to the recommendations of doctors or health workers at the Community Health Center.

The existence of models that provide examples of healthy lifestyles or ways, strengthening healthy behaviors and encouragement and the influence of significant others are factors from the external environment that can affect health. negative impacts caused by disease and the care needed (25).

The negative impact can be a stressful condition for people with diabetes. Physiologically, when someone is under stress, the amygdala sends information to the

locus coeruleus which triggers the autonomic system and is then transmitted to the hypothalamus so that CRF secretion occurs (26).

The support provided by health workers can be in the form of instructions on how to properly diet for DM patients. The patient's understanding of diet instructions will affect the level of compliance of DM patients and vice versa. If the patient does not understand the instructions of health workers, the patient will not comply with the diet recommendations (27).

In the management of DM, health workers act as communicators and patients as recipients of messages. Communication of health workers is in the form of effective communication, a way of conveying messages to DM patients so that they understand, the ease of messages received by patients and instructions in simple language so that DM patients memorize them (28).

Support from health workers can influence the compliance behavior of DM patients. Health workers such as nurses act as educators by providing accurate information to diabetes mellitus (DM) patients about DM, providing health education related to prevention so that no further complications occur, treatment for patients and providing health education on how to properly manage diabetes mellitus so that it can motivate DM patients (29).

Support from health workers for DM patients in this study was in the form of doctors/health workers providing the information needed, always reminding them to take their medication every day when they come for a check-up, always asking their families to monitor the food they consume, and paying attention to all complaints they experience.

The availability of food in the household also influences compliance with medical nutrition therapy for Type 2 DM patients, through changes in eating behavior in accordance with the DM diet recommended by health workers (14).

Food and nutrition have a very important role in relation to improving the quality of human life. Therefore, food must always be

available at all times with good quantity and quality. The availability of household food that is available is quite good and is very important in fulfilling family nutrition, especially in this case, fulfilling the diet of type 2 DM patients (30).

The availability of food for DM patients in this study includes access to food and food ingredients, food ingredients or food are always available at home so that no family member goes hungry because there is no food and food that is in accordance with the doctor's recommendations is easy for me to get.

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