Relationship between Knowledge Level and Dietary Adherence in Patients with Type II Diabetes Mellitus at Pajang Health Center Surakarta

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Abstract

Deficiency in glucose metabolism due to absolute or relative insulin deficiency leads to increased blood sugar levels beyond the established normal range; this condition is characterized by a collection of symptoms called diabetes mellitus. Dietary adherence in individuals with type II diabetes mellitus can be seen from their level of knowledge. The research aims to determine the relationship between the level of knowledge and dietary compliance in people with type II diabetes mellitus. This research is a quantitative research with a cross-sectional approach. This research was conducted in the Pajang Surakarta Community Health Center area on all Type II Diabetes Mellitus sufferers and was carried out in November 2023. The research population was all Diabetes Mellitus patients at the Pajang Surakarta Community Health Center, as many as 148 people. The research sampling technique was Consecutive Sampling, so the sample obtained was 60. Data was collected using questionnaires and interviews. Analysis of research data with bivariate analysis using the Chi-Square test. The research results show a real relationship between the knowledge level and diet adherence with a p-value = 0.040. The level of knowledge about Diabetes can influence adherence to a diabetes diet because patients need good knowledge regarding recognizing the signs and symptoms of DM, the risk of complications occurring, and care in treating Diabetes. Therefore, the role of health workers is needed to hold outreach activities to provide knowledge about diabetes mellitus, starting from the definition, signs and symptoms, risk factors, prevention methods and complications that occur by providing regular and scheduled counselling.

Keywords: Dietary Adherence, Diabetes Mellitus, Knowledge

INTRODUCTION

Diabetes mellitus is a collection of symptoms that occur in a person characterized by increased blood sugar levels above normal values caused by impaired glucose metabolism due to insulin deficiency, either absolutely or in the absence of insulin relative to the patient (Massiani et al., 2023). The high prevalence of Diabetes mellitus is due to lifestyle, environmental factors and genetic factors (Wibisana et al., 2021).

The number of people with diabetes mellitus is increasing every year. Based on data from the International Diabetes Federation (IDF), 1 in 10 people suffer from diabetes mellitus. The total number of people affected reaches 537 million adults between 20 and 79. (IDF, 2021). According to the World Health Organization, 422 million adults suffer from diabetes mellitus. In Indonesia, the prevalence of Diabetes is fifth in the world, reaching 10.6% of the total population of 179.2 million people or 19.47 million sufferers (WHO, 2022).

According to the Ministry of Health of the Republic of Indonesia, in 2018, it is estimated that the number of people with Diabetes will increase to 21.3 million by 2030. One

of the contributors to the high prevalence of Diabetes is Central Java province, which ranks second in non-communicable diseases after hypertension. The prevalence of Diabetes mellitus in Central Java Province increased by 6.33% (Kemenkes RI, 2018).

Diabetes Mellitus prevention and control efforts in Indonesia through education, early detection of risk factors for non-communicable diseases (NCDs) and management according to standards. The government, through Presidential Instruction of the Republic of Indonesia number 1 of 2017, The Healthy Living community movement also helps to encourage the acculturation of healthy living behaviors for the entire community, including people with risk factors for non-communicable diseases and people with Diabetes Mellitus. One of the controls of Diabetes Mellitus is dietary regulation. Dietary arrangements adjust to the calorie needs needed by people with Diabetes Mellitus, combined with their daily physical activity,, so they are well fulfilled. Settings include the content, quantity and timing of food intake such as type, amount, and schedule so that people with Diabetes Mellitus have an ideal body weight and blood sugar can be controlled properly (Kemenkes RI., 2020).

Diabetes mellitus, if not treated properly can be at risk of complications, one of the most commonly experienced impacts is diabetic neuropathy or peripheral nerve damage in the lower extremities of the feet which causes insufficient blood supply from the heart to the tissues, resulting in sensory disturbances due to nerve damage in the lower extremities, symptoms are tingling, numbness, or pain in the feet so that this can cause complications in the form of diabetic foot (Kementerian Kesehatan RI, 2020).

Knowledge of people with diabetes mellitus is crucial in identifying behaviours that can reduce the risk of complications. If the patient's knowledge about Diabetes is good, the patient's behaviour towards treatment will be good. As health workers recommend, it is very important to improve medication behaviour, follow a healthy diet and live a healthy lifestyle. The success of diabetes treatment is highly dependent on compliance with taking medication. Many previous researchers on the relationship between knowledge and adherence have different results (Marito et al., 2021).

Adherence to a diet is challenging due to the frequent need to make continuous changes to eating habits and the way food is prepared. Adhering to an appropriate diet can effectively maintain blood glucose levels within the normal range for people with diabetes mellitus. The effectiveness of individual diets for people with Diabetes mellitus depends on the diet's suitability and the patient's adherence to it. Adhering to healthy and appropriate dietary rules can be useful in managing diabetes mellitus in the entire population (Wibisana et al., 2021). Currently, dietary adherence among DM patients in Indonesia needs to be improved. Although

dietary management is important in preventing blood glucose elevation and reducing complications in DM patients, adherence to dietary guidelines is still inadequate (Marito et al., 2021).

From the preliminary study in August, case data of DM patients in 2023 with male and female genders were obtained, and there were 148 patients with type II DM at the Pajang Health Center in Surakarta, Laweyan village. Through interviews with NCD program holders, it is known that the programs developed to prevent NCDs are now functioning effectively. For example, the Chronic Disease Management Program (Prolanis) in the Laweyan sub-district organizes exercise and health counselling activities. In addition, doctors and nurses also conduct routine blood sugar checks at the Pajang Community Health Center. However, despite routine glucose level checks and programs such as exercise and health counselling, patients with type II diabetes still have blood glucose levels within abnormal limits.

Factors that cause lack of knowledge in patients are one of them from the level of education, this is the case of many patients who have low education with school graduates, therefore the lower the education, the lower the level of knowledge. What makes them reluctant to carry out a diet is of them a lack of economy, lack of knowledge to regulate diet, lack of knowledge of the impact of complications that will occur, lack of knowledge of the importance of health in each individual and respondents still think that Diabetes Mellitus is a common disease that everyone will experience. In addition, the respondent also said he needed to carry out the diet properly because he thought it was troublesome.

The respondent's belief in the rules of running a diet is still minimal; for that reason, the respondent does not limit eating foods that can worsen his health condition, one of which is that the Respondents still consume a lot of foods that contain sugar and carbohydrate foods such as white rice and nood. Furthermore, most of them still ignore the importance of setting a diabetes mellitus diet because they do not know the diabetes mellitus diet. They also still have the habit of drinking sweet tea every morning and evening.

From this description, the researcher is interested in conducting a study on the Relationship between Knowledge Level and Dietary Compliance in Patients with Type II Diabetes Mellitus at the Pajang Surakarta Health Center. This study aimed to determine the relationship between the level of knowledge and dietary compliance in patients with type II diabetes mellitus at the Pajang Surakarta Health Center.

METHODS

This type of research uses quantitative methods with correlative descriptive research. This study used a Cros Sectional design. The study began from October to November 2023. This research was conducted in the Pajang Surakarta Health Center area on all type II Diabetes Mellitus patients.

The population in this study were all Diabetes Mellitus patients at Pajang Health Center Surakarta and patients who underwent visits as many as 148 people. The inclusion criteria of this research sample are all Diabetes Mellitus patients who seek treatment at the Pajang Surakarta Health Center, aged over 20 years, willing to participate in the study, and can communicate well. While the sample exclusion criteria are patients who have severe complications, patients who are pregnant or breastfeeding, patients who experience senility and are not willing to be respondents.

The sampling technique used in this study was the Non Probability Sampling method with the Consecutive Sampling technique. So, a sample of 60 people was obtained. The independent variable in this study is the level of knowledge, while the dependent variable is dietary compliance.

This research was conducted using a questionnaire with two variables. The first variable level of knowledge consists of 12 question items with answer "correct" score of 1 and the answer "wrong" score 0, the second variable diet compliance consists of 14 question items with answers "always" score 4, "often" score 3, "rarely" score 2, "never" score 1. The validity and reliability of the questionnaire have been tested, all question items are valid (>0.70) with a Cronbach's alpha value of 0.806 at the level of knowledge and valid value (>0.90) with a Cronbach's alpha value of 0.957 on dietary compliance.

The questionnaire was compiled and developed by the researcher based on existing literature. Before filling out the questionnaire, respondents were given informed consent and respondents were explained how to fill in. Data analysis used bivariate analysis using the chi-square test, and the data was processed using SPSS software version 20. This research has passed the ethical test of 5079/B.1/KEPK-FKUMS/IX/2023.

RESULTS

The research findings will present the data in tabular form. The data table is obtained from the demographics of respondents, including age, gender, education level, profession, knowledge level, dietary compliance, as well as the relationship between knowledge level and dietary compliance which can be seen as follows:

Table 1 Frequency Distribution of Characteristics of respondents with Diabetes Mellitus in the Pajang Health Center area Surakarta

Characteristics	Frequency	%
Age		
50-59 years	18	30.0
60-69 years	29	48.35
70-81 years	13	21.7
Gender		
Male	14	23.3
Female	46	76.7
Last education		
Not in school	4	6.7
Not graduated from elementary school	6	10.0
Elementary	26	43.3
Junior high school	14	23.3
High school	9	15.0
Bachelor's degree	1	1.7
Occupation		
Merchant	5	8.3
Farmers	2	3.3
Self-employed	3	5.0
Housewife	30	50.0
Not working	16	26.7
Labourer	2	3.3
Retired	2	3.3
Length of time suffered		
1-5 Years	39	51.7
6-10 Years	12	20.0
11-15 Years	4	6.7
16-20 Years	1	1.7
21-15 Years	1	1.75
>25 Years	3	5.0

The data in Table 1. presents the research findings regarding the characteristics of the respondents. The findings show that of the total responses, 29 people (48.3%) were in the age range of 60-69 years, with the majority being female, namely 46 people (76.7%). The average occupation of people with Diabetes is housewife, namely 30 people (50.0%). Most respondents had completed elementary school as the highest level of education, as many as 26 people (43.3%). 51.7% of respondents experienced diabetes mellitus in 1-5 years, equivalent to 39 people.

Table 2. Distribution and frequency of knowledge levels and dietary compliance in patients with Diabetes Mellitus

Variable	Frequency	%
Knowledge Level		
Good	40	66.7
Less Good	20	33.3
Total	60	100
Dietary Adherence		
Compliant	25	41.7
Non-compliant	35	58.3
Total	60	100

Based on Table 2. from the data obtained, it is known that 40 respondents (66.7%) have high knowledge, while 20 respondents (33.3%) have low knowledge. The level of dietary compliance with the highest number in the non-compliant category was 35 respondents (58.3%), and 25 respondents (41.7%) were in the compliant category.

Table 3. Relationship between Knowledge Level and Dietary Compliance in Patients with Type II Diabetes Mellitus

Knowledge Level	Dietary Adherence				Total		*p-value*
	Non-compliant		Compliant				
	n	%	n	%	n	%	
Less good	16	26.7	5	8.3	21	35.0	
Good	19	31.7	20	33.3	39	65.0	0.040
Total	35	58.3	25	41.7	60	100	

The results of the bivariate analysis of the chi-square test based on Table 3 obtained the results of respondents in the category of poor knowledge level had dietary compliance that was not compliant 16 respondents (26.7%), while the category of good knowledge level had compliant dietary compliance as many as 5 respondents with a percentage (8.3%).

The level of knowledge of respondents regarding dietary compliance is positively correlated with their dietary compliance. Those with higher knowledge were more compliant, while those with lower knowledge were less compliant.

The chi-square test yielded a significance value (p-value = 0.040), which shows that $p < 0.05$. Because the value is <0.05, the null hypothesis (Ha) is rejected, indicating that there is a relationship between the level of knowledge of dietary compliance of individuals with type II DM at the Pajang Health Center in Surakarta.

DISCUSSION

The relationship between knowledge level and dietary compliance in patients with type II diabetes mellitus

Knowledge results from knowing and occurs after a person senses a certain object. The sensing of objects occurs through the five human senses, namely sight, hearing, smell, and taste

(Marengke et al., 2020). A person's compliance in undergoing a diabetic diet is how individuals can manage a healthy lifestyle, a healthy diet such as regulating the type of food, meal schedule, number of meals, and meal time appropriately and correctly to control blood sugar levels in the body.

Adherence is the degree to which a patient carries out treatment and behaviouraccording to the doctor's or others' directionsdherence to diet is difficult to achieve because it often requires long-term changes in consumption habits and food preparation methods. A proper diet in patients with Diabetes mellitus can keep blood sugar levels within normal limits. The success of diet in patients with diabetes mellitus is influenced by the accuracy of the diet and the patient's compliance. Adherence to a healthy and proper dietary arrangement can prove effective in the management of Diabetes mellitus in the entire population (Wibisana et al., 2021)

Based on research conducted at the Pajang Health Center in Surakarta, it can be concluded that respondents who have a good level of knowledge have compliant diet compliance, and respondents with a poor category have non-compliant diet compliance. The results of the statistics obtained results that there is a relationship between the level of knowledge and dietary compliance in patients with type II diabetes mellitus at the Pajang Surakarta Health Center.

The rThis study's results align research conducted by Massiani (2023), which states that there is a relationship between the level of knowledge and dietary compliance in patients with Diabetes mellitus in the Kereng Bangkirai Health Center Area. Research Muhammada et al., (2022), stated that there is a relationship between knowledge and dietary compliance in patients with type 2 diabetes mellitus, good knowledge has a 15 times greater chance of being obedient than poor knowledge. Diabetes Mellitus patients with good knowledge of DM are likely to have high compliance with their treatment. Patients with less knowledge are also likely to be less compliant with the treatment recommended by health workers; they may not even have treatment compliance because they feel there is nothing wrong with what they are doing. In addition, experience also affects a person's knowledge, the more a person has experience in his daily life, positive experiences, will add new knowledge to the person himself.

The study states a significant relationship exists between knowledge and dietary adherence (Wardhani, 2021). Knowledge is influenced by experience, environment and socio-culture. The experience gained is perceived and believed, giving rise to motivation and intention to act, which then triggers the emergence of behaviour (Bistara et al., 2018; Susanti et al., 2018). Patients who lack understanding about DM and how to undergo appropriate

therapy can cause therapy failure. This is due to the patient's lack of knowledge and understanding and lack of information related to DM (Patandean et al., 2023; Nadirawati et al., 2021).

Knowledge makes a person aware of maintaining their health. Education affects the learning process, the higher a person's education, the easier it is to receive information. Knowledge is closely related to education, where a higher-education person is expected to have broader knowledge (Ramadhan et al., 2020). Several strategies can be tried to improve adherence, namely from the patient's perspective or internally consisting of increasing self-control, increasing self-efficacy, seeking information about DM treatment, increasing self-monitoring, and from a medical perspective consisting of improving the communication skills of doctors, providing clear information to patients about their disease and how to treat it, providing social support, behavioural approaches (Simanjuntak et al., 2021; Pardede Amidos et al., 2022).

Individual compliance is also influenced by the motivation of individuals to behave healthily and maintain their health because motivation is a psychological process that reflects the interaction between attitudes, compliance, perceptions and decisions that occur in a person (Salma et al., 2020). Providing education is an effort that can be used to improve the knowledge and skills of people with diabetes mellitus. Lack of knowledge can affect the actions taken (Kusnanto et al., 2019).

Knowledge or cognition is a domain that is very important for forming a person's actions or behaviour (Hoque, 2017; Verplanken et al., 2019). Patient knowledge about diabetes mellitus is a tool that can help patients manage Diabetes throughout their lives. The better the patient's understanding of their disease, the better their understanding of how to work together in managing their disease (Eknithiset et al., 2017).

Dietary adherence, the interest or desire of dieters to get a healthy body is a dispersed force from within the individual to carry out a diet in patients with diabetes mellitus. It is very necessary because the diet in people with diabetes mellitus not only requires a short time but also takes a lifetime to achieve dietary compliance. Patience and motivation are also needed to support undergoing dietary compliance. Patience and motivation can be obtained from relationships with the closest people, such as family, friends, or health workers. As the closest person, the family should participate fairly in supporting people with diabetes mellitus. Support from the closest family will increase the desire to achieve the highest degree of health (Rahmatiah et al., 2022).

Patients' knowledge about type II diabetes mellitus is a tool that can help sufferers carry out diabetes management during their lifetime so the more and better sufferers understand their disease, the more they understand how to change their behaviour and why it is needed. Management of Diabetes mellitus to control blood sugar levels, one of which is diet therapy (Rosmeri et al., 2023).

Dietary adherence is crucial to developing habits that can help patients follow their diet schedule. Patients who are not compliant in carrying out dietary therapy can have uncontrolled blood sugar levels. Adherence can be very difficult and requires supporting factors for compliance to be successful,. These supporting factors are family support, knowledge, and motivation to become accustomed to changes made by how we manage to take the time and opportunity needed to adjust. Because it takes work for someone to change so quickly (Kartini et al., 2018).

The level of a person's compliance in taking action to prevent the onset of diabetic complications is based on the respondent's knowledge of how to reduce the risk factors that occur how to prevent diabetic complications, one of which can be done by carrying out a diabetic diet, so that the better the level of knowledge about diabetes prevention, the better it is to take action to prevent diabetic complications. Furthermore, vice versa, the less good the level of knowledge about diabetes prevention, the more disobedient it is to take measures to prevent diabetes complications. One way to do this is by carrying out a diabetes diet correctly.

The results of this study concluded that the better the level of knowledge of respondents, the more obedient their compliance in carrying out a diabetic diet. Based on the cross-tabulation of the relationship between knowledge level and diabetes diet compliance, most respondents have good knowledge and are compliant in carrying out their dietary compliance. For respondents who still have a poor level of knowledge and non-compliant dietary compliance, there needs to be good follow-up from respondents who want to improve their knowledge and increase dietary compliance in type II diabetes mellitus sufferers by living a healthy lifestyle, obeying recommendations that local health workers have given.

CONCLUSIONS

Based on the results of the study show that there is a relationship between the level of knowledge of type II diabetes mellitus patients in the Pajang Surakarta Health Center area and compliance in carrying out the diet. A higher level of knowledge is associated with greater adherence to the diabetes mellitus diet.

It is expected that health workers hold socialization activities to provide knowledge about diabetes mellitus starting from understanding signs and symptoms, risk factors, how to prevent complications that occur thoroughly by providing routine and scheduled counselling. For respondents, it is hoped that they can organize a healthy lifestyle and increase their knowledge about diabetes mellitus so that their diet compliance can run well. Moreover, For the patient's family, it is hoped that they can encourage the patient and help them improve their quality of life and a healthy lifestyle.

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