ISSN 2597– 6052

DOI: https://doi.org/10.56338/mppki.v7i7.5581

MPPKI

Media Publikasi Promosi Kesehatan Indonesia

The Indonesian Journal of Health Promotion

Research Articles *Open Access*

The Relationship between Levels of Knowledge and Anxiety on Blood Sugar Levels in Diabetes Mellitus Patients at RSAU dr. Siswanto

Yohanes Wahyu Nugroho[1]*, Dewi Anggraeni[2]

[1]Nursing Study Program, STIKes Mitra Husada Karanganyar | ywnugroho1986@gmail.com

[2]Nursing Study Program, STIKes Mitra Husada Karanganyar | ch.saputra@yahoo.com

*Corresponding Author: ywnugroho1986@gmail.com

ABSTRACT

Introduction: Diabetes is a disease characterized by high blood sugar levels in the urine due to disruption of metabolism due to the production and function of the hormone insulin not running as it should. Diabetes can cause psychological problems including anxiety levels and even stress. Patients with diabetes mellitus who have high knowledge can maintain a healthy diet and lifestyle behavior so that blood sugar levels can always be controlled.

Objective: This study aims to analyze the relationship between knowledge level and anxiety to blood sugar levels in patients with Diabetes Mellitus at RSAU dr. Siswanto.

Method: This study is a quantitative research with a correlational approach. The population in this study is 64 people with diabetes mellitus at RSAU dr. Siswanto Karanganyar for the period of March 2024. The sampling technique uses total sampling, so that the number of samples in this study is 64 patients. The instrument used in this study is in the form of a questionnaire. To analyze bivariate data using the Kendal's tau test.

Result: The results of the research analysis on the relationship between knowledge level and blood sugar levels obtained a significance value of 0.001 less than 0.05. The results of the research analysis on the relationship between anxiety and blood sugar levels obtained a significance value of 0.031 less than 0.05. The results of the multivariate test showed a significance value of 0.000 < 0.05 and an F_{cal} value of 30.475.

Conclusion: there is a significant relationship between the level of knowledge and blood sugar levels of patients with diabetes mellitus in RSAU dr. Siswanto Karanganyar. There was a significant relationship between anxiety and blood sugar levels in patients with diabetes mellitus in RSAU dr. Siswanto Karanganyar. There was a significant relationship between knowledge and anxiety on blood sugar levels of patients with diabetes mellitus in RSAU dr. Siswanto Karanganyar.

Keywords: Blood Sugar Levels; Knowledge; Anxiety; Diabetes Mellitus

INTRODUCTION

Diabetes is a disease characterized by high blood sugar levels in the urine due to disruption of metabolism due to the production and function of the hormone insulin not running as it should. High blood sugar levels for a long period of time can damage several body systems, such as heart blood vessels, kidneys, nerve damage (stroke), and death [1,2].

Based on global status data *report on noncommunicalbe diseases* from WHO in 2023 that the non-communicable disease diabetes mellitus ranks second, which is around 2.0 million, including deaths due to kidney disease caused by diabetes. At the end of 2021, the International Diabetes Federation (IDF) in the 10th edition of the Atlas confirmed that diabetes is among the fastest-growing global health emergencies of the 21st century. In 2021, more than half a billion people from all over the world were living with diabetes, or 537 million people to be exact, and this number is projected to reach 643 million by 2030, and 783 million by 2045. In addition to the large number of diabetics, it is estimated that the number of people with blood glucose levels that are starting to increase or in the prediabetes phase, namely impaired glucose tolerance in 2021, is around 541 million. Diabetes in the population also has the consequence of a high mortality rate associated with diabetes, which is estimated to be more than 6.7 million in the group of adults between the ages of 20–79 years [3,4].

In Indonesia, the prevalence of diabetes mellitus is 10.7% after hypertension is 76.5% [5]. These two diseases are the main priorities in controlling non-communicable diseases in Central Java [6]. The prevalence of people with diabetes mellitus in Karanganyar Regency in 2019 was 13,327 patients, in 2020 it decreased to 11,670 and in 2021 it increased again to 12,960 patients. The highest estimated number of people with Diabetes Mellitus is in the working area of the Gondangrejo Health Center as many as 1,020 while in the working area of the Colomadu I and II Health Center there are 1,174 people with diabetes mellitus [7].

Factors that can cause blood glucose to rise are overeating, such as eating or snacking with more carbohydrates than usual, inactivity, not enough insulin or oral diabetes medications, side effects from other medications such as steroids or antipsychotic medications, illness, stress, short-term or long-term pain, menstrual periods, and dehydration [8].

According to PERKENI, the increase in the number of people with type-2 diabetes mellitus can be caused by many factors, including hereditary/genetic factors, age, obesity, lack of physical activity, pregnancy, smoking and stress [9,10]. Research conducted by Ivke et al. one of the factors that affect blood sugar levels is the level of knowledge, with a good level of knowledge so that diabetic mellitus patients will be able to face the anxiety experienced by seeking treatment and prevention of diabetes mellitus [11]. In addition, with high knowledge, diabetic mellitus patients can maintain a healthy diet and lifestyle so that blood sugar levels can always be controlled.

Another factor that affects blood sugar levels is anxiety. The onset of anxiety begins with a stress reaction that occurs continuously. The first reaction of the stress response is the secretion of the sympathetic nervous system to secrete norepinephrine which causes an increase in heart frequency. This condition causes blood glucose to increase as an energy source for perfusion. An increase in stress hormones produced can cause blood sugar levels to rise. This is related to the presence of a neuroendocrine system through the Hypothalamus Pituitary Adrenal pathway [12].

Diabetes can cause psychological problems including anxiety levels and even stress [13,14]. Anxiety level is a general feeling, where a person experiences anxiety, feels afraid or loses confidence and feels weak so that they are unable to behave and act rationally [15,16].

The level of anxiety in people with diabetes mellitus is due to the fact that diabetes is considered a frightening disease, because it has a complex negative impact on the survival of individual anxiety. Anxiety that occurs because a person feels threatened both physically and psychologically [17–19]. The results of the study on the Relationship between Anxiety and Blood Sugar Levels of Type 2 Diabetic Militus Patients showed that there was a significant relationship between anxiety and blood sugar levels of patients with type 2 diabetes mellitus at Salatiga Hospital in this study obtained p=0.000 and r=0.902. In this case, a person with chronic diseases including diabetes militus is prone to experiencing anxiety [20].

The results of Angriani and Baharuddin's research on factors related to the level of anxiety of people with diabetes mellitus, showed that there was a relationship between the length of time suffering from type 2 diabetes mellitus and the level of anxiety [2]. The level of anxiety that occurs in type 2 diabetes mellitus patients is caused by a personal fear of complications arising from the disease experienced. Due to limited information about type 2 diabetes mellitus and feelings of uncertainty, hopelessness, depression, and nervousness in living life after being diagnosed with diabetes mellitus [21].

Based on a preliminary study in January 2024 in medical record data at RSAU dr. Siswanto Karanganyar is known to have 13 diabetes patients in October 2023, 325 outpatients, 32 patients in November and 331 outpatients, 32 patients in December and 312 outpatients. patient. The results of interviews with 5 diabetes mellitus patients who were undergoing outpatient treatment showed that 2 patients routinely carried out health checks, especially blood sugar levels and always experienced anxiety if blood sugar levels rose, 1 respondent did not really understand about

treating diabetes mellitus regarding food taboos, 2 respondents often felt get tired quickly and become anxious if you find out that your blood sugar levels are rising.

Based on the background mentioned above, the researcher is interested in conducting a study with the title: "the relationship between knowledge level and anxiety on blood sugar levels in patients with Diabetes Mellitus at RSAU dr. Siswanto Karanganyar".

METHOD

This study is a quantitative research with a cross sectional design, namely the researcher makes observations or measurements on dependent and independent variables that are assessed once in a time. Using a correlation approach, namely knowing the relationship between independent variables and dependent variables [22]. This research is at RSAU dr. Siswanto Karanganyar, which is taking samples from patients with a diagnosis of diabetes mellitus. The time of this research was carried out in March 2024.

The population in this study is all people with diabetes mellitus at RSAU dr. Siswanto Karanganyar for the period of March 2024 with a population of 64 people with diabetes mellitus. The sampling technique in this study uses total sampling. The reason for taking the total sampling is because the number of population is less than 100. So the number of samples in this study is 64 people.

This research instrument uses 3 questionnaires, namely a questionnaire about the demographics of people with diabetes mellitus, a questionnaire on knowledge level and anxiety. The demographic data questionnaire in this study consisted of name (initial), age, type of education, last education, employment status, and long time suffering from DM. The knowledge level questionnaire in this study uses the DKQ-24 (Diabetes Knowledge Questionaire) questionnaire, which is a questionnaire about the knowledge of patients about diabetes mellitus. The DKQ-24 (Diabetes Knowledge Questionnaire) question list contains 24 question items. The type of questionnaire used is the Guttman scale with a choice of right and wrong answers. If the respondent answers correctly, he gets a score of 1, and if the respondent answers incorrectly, he gets a score of 0. The score value can be seen from the correct answers of respondents 0 – 24. The way to measure the DKQ-24 questionnaire is by summing all questions from no. 1-24 with a category of <55, namely the knowledge is not enough, 56-75 is enough, and 76-100 is good.

To measure anxiety by using the Zung self questionnaire which consists of 20 question items containing no anxiety, mild anxiety, moderate anxiety, severe anxiety. Questions are divided into two, namely favourable questions which are positive questions and unfavourable questions or negative questions (not supportive). The type of questionnaire used is the Likert scale with the assessment of the favorable questionnaire never (4), sometimes (3), enough (2), always (1) while unfavourable never (1), sometimes (2), enough (3), always (4) with a total score of 80. The total results of the score were categorized as follows: a score of 20-44: normal (not anxious), a score of 45-59 for mild anxiety, a score of 60-74 for moderate anxiety and a score of 75-80 for severe anxiety.

The data analysis in this study uses univariate analysis conducted to describe each variable measured. The goal is to see the frequency and percentage distribution. Univariate analysis was carried out on the characteristics of nurses including age, gender, last education, employment status, independent variables, namely knowledge level and anxiety, while dependent variables were blood sugar levels. Meanwhile, bivariate analysis was carried out to see if there was a relationship between the independent variables of knowledge level and anxiety and the dependent variable of blood sugar levels. This study uses a chi square test with a confidence level of 95% (α=0.05). It is said that there is a meaningful relationship if the p value < 0.05.

RESULTS

Characteristics of Respondents

The characteristics of the respondents in this study are outpatient diabetic mellitus patients at RSAU dr. Siswanto Karanganyar for the period of March 2024 as many as 64 respondents who meet the inclusion criteria, including age, gender, education, and occupation. The characteristics of the respondents in this study are presented in the following frequency distribution:

Table 1. Frequency Distribution of Respondent Characteristics (n=64)

Characteristics of Respondents	Frequency (F)	Percentage (%)
Age		
≤ 35 years	3	4,7
36 – 45 years old	12	18,8
46 – 55 years old	20	31,3
> 56 years	29	45,3
Gender		
Man	19	29,7
Woman	45	70,3

Education		
Elementary school	2	3,1
Junior high school	21	32,8
Senior high school	30	46,9
Bachelor	11	17,2
Work		
Self employed	21	32,8
Private	28	43,8
Civil servants	3	4,7
Merchant	4	6,3
Housewife	8	12,5
Total	64	100%

Source: data processing results (2024)

Characteristics of respondents presented in Table 1. showed that the majority of research respondents were between the ages of more than 56 years old, 29 respondents (45.5%) and 45 respondents (70.3%). The high school education background was 30 respondents (46.9%), and the majority of research respondents worked in the private sector 28 respondents (43.8%).

Univariate Analysis

The univariate analysis in this study included the level of knowledge, anxiety and blood sugar levels of outpatient diabetes mellitus patients of RSAU dr. Siswanto Karanganyar. The univariate analysis is described in the following table:

Level of Knowledge

Table 2. Knowledge Level Frequency Distribution (n=64)

Level of Knowledge	Frequency (F)	Percentage (%)
Good	24	37,5
Enough	24	37,5
Less	16	25,0
Total	64	100%

Source: data processing results (2024)

Table 2. showed that the majority of research respondents had a good and sufficient level of knowledge, each of which was 24 respondents (37.5%), while 16 respondents (25.0%) lacked knowledge.

Anxiety

Table 3. Anxiety Frequency Distribution (n=64)

Anxiety	Frequency (F)	Percentage (%)
Usual	5	7,8
Light	31	48,4
Keep	16	25,0
Heavy	12	18,8
Total	64	100%

Source: data processing results (2024)

Table 3. showed that the majority of respondents who experienced anxiety were in the mild category as many as 31 respondents (48.4%) and respondents with mild anxiety were 5 respondents (7.8%).

Blood Sugar Levels

Table 4. Frequency Distribution of Blood Sugar Levels (n=64)

Blood Sugar Levels	Frequency (F)	Percentage (%)
Usual	17	26,6
Keep	38	59,4
Bad	9	14,1
Total	64	100%

Source: data processing results (2024)

Table 4. showed that respondents with blood sugar levels were dominated by the medium category as many as 38 respondents (59.4%) and respondents with poor blood sugar levels were 9 respondents (14.1%) while those in the normal category were 17 respondents (26.6%).

Bivariate Analysis

This study uses bivariate analysis, namely to determine the relationship between knowledge level and anxiety to blood sugar levels of diabetic mellitus patients at RSAU dr. Siswanto Karanganyar. Bivariate analysis in this study uses the Kendal tau correlation test. The results of the Kendal test are as follows:

Table 5. Kendal tau Test Results of the Relationship of Knowledge Level to Blood Sugar Levels

Level of Knowledge	Blood Sugar Levels			Total	*p*	r
	Usual (f)	Keep (f)	Bad (f)			
Good	17	7	0	24	0,001	0,742
Enough	0	23	1	24		
Less	0	8	8	16		
Total	17	38	9	64		

Source: primary data processing (2024)

Based on Table 5. showed a p value of 0.001 < 0.05 so that it can be concluded that there is a significant relationship between the level of knowledge and blood sugar levels of patients with diabetes mellitus at RSAU dr. Siswanto Karanganyar with a relationship strength of 0.742 including a strong correlation.

Table 6. Kendal tau Test Results of the Relationship of Anxiety to Blood Sugar Levels

Anxiety	Blood Sugar Levels			Total	*P*	r
	Usual (f)	Keep (f)	Bad (f)			
Usual	2	3	0	5	0,001	0,281
Light	8	23	0	31		
Keep	4	10	2	16		
Bad	3	2	7	12		
Total	17	38	9	64		

Source: primary data processing (2024)

Based on Table 6. showed a p value of 0.001 < 0.05 so that it can be concluded that there is a significant relationship between anxiety and blood sugar levels of patients with diabetes mellitus at RSAU dr. Siswanto Karanganyar with a relationship strength of 0.281 including a weak correlation.

Table 7. Multivariate Test Results of the Relationship between Knowledge and Anxiety on Blood Sugar Levels

ANOVA[a]

	Type	Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	35435.200	2	17717.600	30.475	.000b
	Residual	35464.800	61	581.390		
	Total	70900.000	63			

a. Dependent Variable: Blood Sugar Levels
b. Predictors: (Constant), Anxiety, Knowledge Level
Source: primary data processing (2024)

Based on Table 7. showed a significance value of 0.000 < 0.05 and an Fcal value of 30.475 so that it can be concluded that there is a significant relationship between knowledge and anxiety on blood sugar levels of patients with diabetes mellitus at RSAU dr. Siswanto Karanganyar.

DISCUSSION

Characteristics of Respondents

Age

The age characteristics of the research respondents are known to be 45.3% of respondents over 56 years old who are in the elderly category. This shows that the respondents are included in the elderly age. The results of this study are in line with the research of Hariyanti et al. respondents of diabetes mellitus patients are mostly over 55 years old. The age of a person in this late adult group is a mature age in terms of life experience [23]. A person's maturity can be seen from a person's age which is a factor that affects the ability, knowledge, responsibility in acting, thinking and making decisions, the older the employee, the higher the commitment to organization. The results of this study are different from the research of Khairunnisa et al, most of the research respondents are in early adulthood [24]. A person's age can affect his behavior at work because the older he gets, the more skilled he is in doing his work [25].

According to researchers, a person's age shows a person's maturity in thinking and acting so that the older they get, the more knowledge a person has. The age of the respondents in this study is the elderly age group. Age that is considered mature in terms of processing information and knowledge obtained. The older the respondent, the more knowledge and experience they have about personal health management.

Gender

The respondents to the RSAU dr. Siswanto Karanganyar research were dominated by 45 respondents (70.3%). This shows that there are more patients with blood gular levels at RSAU dr. Siswanto Karangnayar than men. This shows that female respondents are higher than men, this is because several risk factors cause a high incidence of DM in women.

Education

The majority of research respondents had a high school education background as many as 30 respondents (46.9%). The results of this study are supported by Bastanta and Gaddafi's research that the respondents to the diabetes mellitus research were dominated by high school education [26]. In general, higher education will affect knowledge. The higher the education, the better the knowledge, on the contrary, the lower the education, the lower the knowledge. This shows that a person with a high education will have the opportunity to behave well. Highly educated people have an easier time understanding and adhering to dietary behaviors compared to poorly educated people. A higher level of education will make it easier for a person or society to absorb information and implement it in daily behavior and lifestyle, especially in adhering to the management of the DM diet [27].

Higher education levels can affect a person's level of knowledge, the higher a person's level of education, the higher the knowledge. Knowledge about blood sugar levels for diabetic patients is very important, this can control the high and low blood sugar levels of patients. The results of this study are supported by the research of Watta et al. some research respondents with S1 education history [28]. According to the researcher's assumption, the higher the level of education can affect a person's knowledge, the higher the level of education of a person, the better the knowledge in him, this can come from himself, or come from others.

Work

RSAU research respondents of RSAU dr. Siswanto Karanganyar partly worked in the private sector as many as 28 respondents (43.8%). People with DM are higher in people who work, because everyone who has high working hours with irregular schedules is an important factor in managing the DM diet.

Univariate Analysis

Level of Knowledge

The majority of research respondents' knowledge at RSAU dr. Siswanto Karanganyar had a good and sufficient level of knowledge of 24 respondents (37.5%), while the knowledge was insufficient for 16 respondents (25.0%). The results of this study showed that the proportion of normal category blood sugar levels in respondents who had a good level of knowledge was higher than that of respondents who had a background with a low level of knowledge. Respondents with low levels of knowledge were more likely to experience poor category blood sugar levels. This happens because the knowledge that respondents have about diabetes and in the management of the disease will raise awareness for them and will eventually make them behave according to what they know.

Knowledge is related to education, because education is a learning process that is able to change a person's behavior to achieve quality of life. So that the higher a person's education, the higher the diet management so that blood sugar levels can be controlled.

Anxiety

The results of the study on the anxiety of research respondents with blood sugar levels who experienced the majority of anxiety in the mild category were 31 respondents (48.4%) and respondents with mild anxiety were 5 respondents (7.8%). The results of this study showed that the proportion of normal category blood sugar levels in respondents who had mild anxiety was higher than that of respondents who had severe anxiety. Respondents who had a severe category of anxiety tended to have poor category blood sugar levels. This happens because anxiety will affect the severity of a disease suffered. The anxiety experienced by the respondents was able to reduce and even eliminate the motivation to recover so that the respondents did not take care of themselves from the disease so that the disease worsened with poor blood sugar levels.

Blood Sugar Levels

The results of the study on the blood sugar level of the respondents were dominated by the medium category as many as 38 respondents (59.4%) and the respondents with poor blood sugar levels were 9 respondents (14.1%) while the normal category was 17 respondents (26.6%). The results of this study show that blood sugar control in diabetic mellitus patients is still high. Uncontrolled blood sugar levels because some respondents did not regularly follow the right diet and did not actively participate in pronalistic activities [2].

In every human body, sugar must be found, which is commonly called glucose. This glucose is sourced from outside and inside the body. From the outside, glucose is obtained from foods that contain carbohydrates, carbohydrates are then digested in the body to become glucose. Meanwhile, glucose obtained from the body is excreted by the liver or called glycogen as a place to store and manage glucose. Militus Diabetes sufferers are synonymous with high glucose levels in the blood, for this reason it is necessary to carry out blood glucose control, good and optimal control of blood glucose levels to prevent chronic complications.

Uncontrolled blood sugar levels are due to some respondents not regularly doing the right diet and not actively participating in pronalistic activities. The Batua Health Center in Makassar City also provides a schedule for taking medication and checking blood glucose levels in patients with diabetes mellitus. If the patient can follow activities regularly and can diet well, the glucose level in the blood can be controlled, so it cannot cause various other diseases.

To control blood sugar levels in patients with diabetes mellitus, health workers always recommend the DM diet, this aims to make blood sugar levels stable or normal. The results of this study can be concluded that the moderate category of blood sugar levels indicates that DM patients may have obstacles in handling the DM diet, such as the patient's saturation in following dietary therapy that is indispensable to achieve success. Although a diet or diet is required in accordance with the doctor's orders, the reality is that DM patients experience high blood sugar levels. Problems like this are a challenge in overcoming diabetes mellitus.

Bivariate Analysis

The Relationship of Knowledge Level to Blood Sugar Levels

The results of the analysis of the research on the relationship between the level of knowledge and blood sugar levels using the Kendal's tau correlation test obtained a significance value of 0.001 less than 0.05, meaning that there was a significant relationship between the level of knowledge and blood sugar levels of patients with diabetes mellitus in RSAU dr. Siswanto Karanganyar. The results of this study are supported by research conducted by Farida, et al. there is a significant relationship between the level of knowledge and the blood sugar level of DM patients at Puskesmas X with a P value of 0.014 [29]. The level of knowledge is significantly related to blood sugar levels and has an important role in the stability of blood sugar levels in DM patients. The results of the research are in line with a person's knowledge that it is significantly related to blood sugar levels in DM patients. A person's high level of knowledge can be seen through the level of education, so that a person who has a high level of knowledge will have better health information obtained, with good health information, automatically the treatment and recovery of people with diabetes mellitus will be better.

Knowledge is related to education, because education is a learning process that is able to change a person's behavior to achieve quality of life. So that the higher a person's education, the higher the diet management so that blood sugar levels can be controlled. In theory, a person with a high education will have the opportunity to behave well. Highly educated people are easier to understand and adhere to behaviors for healthy living compared to poorly educated people. A higher level of education will make it easier for a person or society to absorb information and implement it in daily behavior and lifestyle, especially in managing blood sugar levels. According to Trisnadewi et al, a person with a higher education will have a wider range of knowledge compared to someone with a lower level of education because education is the basis key to success in treatment [30].

The Relationship Of Anxiety To Blood Sugar Levels

The results of the analysis of the research on the relationship between anxiety and blood sugar levels using the Kendal's tau correlation test obtained a significance value of 0.031 less than 0.05, meaning that there was a significant relationship between anxiety and blood sugar levels of patients with diabetes mellitus RSAU dr. Siswanto Karanganyar. The results of this study are supported by Febrianti's research that there is a significant relationship between anxiety levels and blood sugar levels in diabetic mellitus patients [31]. The level of anxiety is directly proportional to blood sugar levels. Individuals with chronic DM tend to have a high level of anxiety, including in patients with acute DM, they tend not to be able to adapt to diabetes mellitus management such as complying with DM diit, doing physical activity or exercise regularly, doing pharmacological therapy regularly, while in chronic DM patients they tend to be anxious because they are afraid that the disease will worsen and cause various complications. Because anxiety control is needed in DM patients so that blood sugar can also be controlled.

The results of the cross-tabulation analysis show that that the proportion of normal category blood sugar levels in respondents who had mild anxiety was higher than that of respondents who had severe anxiety. Respondents who had a severe category of anxiety tended to have poor category blood sugar levels. This happens because anxiety will affect the severity of a disease suffered. The anxiety experienced by the respondents was able to reduce and even eliminate the motivation to recover so that the respondents did not take care of themselves from the disease so that the disease worsened with poor blood sugar levels. With this high level of anxiety, it will affect blood sugar levels so that blood sugar levels are not controlled [32].

Anxiety can affect blood sugar levels and insulin metabolism through an increase in cortisol, which exerts an influence on eating habits, weight gain and diabetes. Conversely, diabetes management can lead to chronic stress and tension, which in the long run can increase the risk of diabetes. The two are related not only behaviorally, but also biologically. Because this disease is a chronic disease and cannot be cured at all, the treatment must be carried out for life, must carry out a strict diet and how to manage stress, in order to avoid anxiety [2].

Multivariate Analysis

The multivariate analysis in this study used multiple linear regression analysis which aimed to determine the relationship between knowledge level and anxiety on blood sugar levels. The results of the analysis obtained a p value of 0.000 so that it can be concluded that there is a significant relationship between the level of knowledge and anxiety on the blood sugar level of diabetes mellitus patients of RSAU dr. Siswanto Karanganyar. Knowledge levels and anxiety greatly affect blood sugar control. DM sufferers generally experience anxiety about their current condition, will be worried about high blood sugar levels and complications that can occur, so it will cause anxiety. Management of diabetes requires a lot of self-discipline and is thought to cause stress [31].

A similar study was also conducted by Maulasari and there was a relationship between anxiety levels and blood sugar levels in people with type 2 diabetes mellitus with a p value of 0.001 [33]. Mild anxiety is related to tension in daily life and causes a person to become alert and increase their perception space. Mild anxiety can motivate learning and generate growth and creativity. Manifestations that appear at this level are fatigue, irritability, increased perception field, high awareness, ability to learn, increased motivation and behavior according to the response situation of mild anxiety. The physical response of mild anxiety is, i.e., related to tension in everyday events, increased alertness, increased perception of the environment. Cognitive responders are: able to receive complex stimuli, concentrate on problems, solve problems effectively. Emotional responses, namely, inability to sit still, subtle remorse in the hands, sometimes raised voice [2].

Moderate anxiety is allowing a person to focus on important issues and put others aside so that a person experiences elective attention, but can do something directed. Respondents from moderate anxiety are physical respondents: moderate muscle tension, decreased concentration ability, frequent urination, headaches, altered sleep patterns, cognitive response from moderate anxiety: decreased attention span, decreased problem-solving. Emotional response of moderate anxiety: uncomfortable, irritable and impatient [2].

Chronic diseases caused by degenerative diseases such as diabetes mellitus increase very sharply. Changes in the pattern of this disease are thought to be related to a changed way of life. Diets in cities have shifted from traditional diets that contain a lot of carbohydrates and fiber from vegetables to a westernized diet with little fiber. The composition of foods that are high in fat, salt, and a little fiber in ready-to-eat foods has recently been very popular among the Indonesian people.

People with diabetes mellitus have a tendency for blood sugar content to be uncontrolled. Blood sugar levels will increase drastically after consuming these types of foods. Food needs for people with diabetes mellitus do not only fill the stomach, and these foods must be able to maintain blood sugar levels and provide therapy to people with diabetes mellitus. The schedule, amount and type of food that enters the patient's body must be properly regulated and so that it is able to provide therapy for the cure of diabetes mellitus [34].

CONCLUSION

Based on the results of the research and discussion in the previous chapter about the relationship between the level of knowledge and anxiety to blood sugar levels of patients with diabetes mellitus at RSAU dr. Siswanto Karanganyar, it can be concluded as follows:

Overview of the level of knowledge of patients with Diabetes Mellitus at RSAU dr. Siswanto Karanganyar most of the students were in the good and sufficient categories with 24 respondents (37.5%), while 16 respondents (25.0%) lacked knowledge.

An overview of anxiety about blood sugar levels in patients with Diabetes Mellitus RSAU dr. The majority of students who experienced anxiety were in the mild category as many as 31 respondents (48.4%) and respondents with mild anxiety were 5 respondents (7.8%).

There was a significant relationship between the level of knowledge and anxiety about blood sugar levels in patients with Diabetes Mellitus at RSAU dr. Siswanto Karanganyar with a p value of 0.000.

SUGGESTION

The results of this study are expected to provide information for hospital institutions about the importance of knowledge and anxiety about blood sugar levels. In addition, it can also provide nurses' knowledge in an effort to prevent rising blood sugar levels so that complications arise due to increased blood sugar levels. Nurses can carry out one of their roles as caregivers in controlling blood sugar levels.

For educational institutions, the results of this study can be an input and add insight for readers to find out the relationship between knowledge level and anxiety towards blood sugar control, as a source of information and reading materials in the implementation and management of blood sugar control.

For future researchers, the results of this study can be used as a reference or comparison for future research related to factors that affect blood sugar levels in patients with diabetes mellitus. It is also hoped that it can provide theoretical input regarding the relationship between the level of knowledge and anxiety to blood sugar levels of diabetic mellitus patients at RSAU dr. Siswanto Karanganyar.

REFERENCES

1. Yusnita Y, Djafar MHA, Tuharea R. Risiko Gejala Komplikasi Diabetes Mellitus Tipe II di UPTD Diabetes Center Kota Ternate. Media Publ Promosi Kesehat Indones. Januari 2021;4(1):60–73.
2. Angriani S, Baharuddin. Hubungan Tingkat Kecemasan dengan Kadar Gula Darah pada Penderita Diabetes Mellitus Tipe II di Wilayah Kerja Puskesmas Batua Kota Makassar. J Ilm Kesehat Diagnosis. Mei 2020;15(2):102–6.
3. Amal AN, Agustini DD, Amal S. Pencegahan Dan Pengendalian Diabetes Melitus Menggunakan Tanaman Obat Keluarga. Abdima J Pengabdi Mhs. 2023;2(2):8191–7.
4. Sundari SNS, Sutrisno RY. Studi Kasus: Pengaruh Edukasi Penerapan Diet Diabetes Mellitus Terhadap Pengetahuan dan Kepatuhan Pada Pasien Diabetes Mellitus Tipe II. J Sains dan Kesehat. Mei 2023;7(1):61–9.
5. Dinas Kesehatan Provinsi Jawa Tengah. Profil Kesehatan Jateng 2021. 2021. Profil Kesehatan Provinsi Jawa Tengah Tahun 2021.
6. Sarifah M, Siyam N. Determinan Diabetes Melitus Tipe II di Posbindu PTM Puskesmas Pegandon Kabupaten Kendal Tengah. HIGEIA (Journal Public Heal Res Dev. 2023;7(3):365–75.
7. Dinas Kesehatan Kabupaten Karanganyar. Profil Kesehatan Tahun 2022 Kabupaten Karanganyar. Karanganyar: Dinas Kesehatan Kabupaten Karanganyar; 2023.
8. American Diabetes Association. Standards of Medical Care In Diabetes. Arlington: American Diabetes Association; 2023.
9. Fauziyyah MH, Utama F. Literature Review : Faktor-Faktor yang Berhubungan Dengan Kejadian Diabetes Mellitus di Indonesia. Prepotif J Kesehat Masy. Februari 2024;8(1):266–78.
10. Umar R, Rottie J V, Lolong J. Hubungan Stres Dengan Citra Tubuh Pada Penderita Diabetes Melitus Tipe II di Rumah Sakit Pancaran Kasih GMIM Manado 2016. J Keperawatan. Januari 2017;5(1):1–6.
11. Saldeva ID, Rohmawati DL, Sa'adah HD. Hubungan Tingkat Pengetahuan dan Kepatuhan Pengobatan Terhadap Kejadian Peningkatan Kadar Gula Darah pada Pasien Diabetes Melitus di Wilayah Kecamatan Ngawi. J Cakra Med. 2022;9(1):31–42.
12. Derek MI, Rottie J, Kallo V. Hubungan Tingkat Stres dengan Kadar Gula Darah Pada Pasien Diabetes Melitus Tipe II di Rumah Sakit Pancaran Kasih GMIM Manado. J Keperawatan. Januari 2017;5(1):1–6.
13. Dedi D. Hubungan Tingkat Kecemasan Pasien dengan Kepatuhan Diet Pada Pasien Diabetes Mellitus di Rumah Sakit Umum Mitra Medika Medan Tahun 2018. J Keperawatan Prior. Januari 2019;2(1):74–85.
14. Br. Karo M, Sigalingging VYS, Saragih YK. Pengaruh Edukasi Terhadap Penurunan Kecemasan Pada Pasien Diabetes Melitus Dirumah Sakit Santa Elisabeth Batam Kota Tahun 2022. Innov J Soc Sci Res. Februari

2024;4(1):10531–43.
15. Widigda IR, Setyaningrum W. Kecemasan Mahasiswa Pendidikan Matematika Universitas Riau Kepulauan Dalam Menghadapi Skripsi. J Pendidik Mat dan Sains. Maret 2018;6(2):190–9.
16. Dewi R, Fatimah R, Waluya A, Budhiana J, Yulianti M. Hubungan Mekanisme Koping Dengan Kecemasan Pasien Diabetes Melitus Tipe 2 Di Wilayah Kerja Puskesmas Karang Tengah Kota Sukabumi. Media Inf. Mei 2023;19(1):89–95.
17. Putri DT. Faktor Dominan Yang Menyebabkan Kecemasan Pada Pasien Diabetes Mellitus di Wilayah Kerja Puskesmas Tuban. J Multidisiplin Indones. 2023;
18. Karina Y, Widiani E. Relaksasi Otot Progresif Pada Klien Diabetes Mellitus Dengan Masalah Keperawatan Ansietas (Studi Kasus). Nersmid J Keperawatan dan Kebidanan. 2020;3(1):7–16.
19. Wati A, Poltekkes B, Yusuf M. Pengaruh Kecemasan Terhadap Kadar Gula Darah Pada Penderita Diabetes Melitus di RSUD Syekh Yusuf Gowa. Media Keperawatan Politek Kesehat Makassar. Agustus 2019;8(2):16–22.
20. Kusumasari BS. Hubungan Tingkat Kecemasan dengan Kadar Gula Darah pada Penderita Diabetes Melitus Tipe 2 di Puskesmas Kebakkramat 1. J Stethosc. Juli 2020;1(1):8–13.
21. Fauziyah N, Unmehopa YF, Dewi R. Hubungan Mekanisme Koping Dengan Kecemasan Pada Pasien Diabetes Melitus Di Wilayah Kerja Puskesmas Baros Kota Sukabumi. Healthc Nurs J. 2023;5(1):538–45.
22. Nursalam. Metodologi Penelitian Ilmu Keperawatan: Pendekatan Praktis. 5 ed. Jakarta: Salemba Medika; 2020.
23. Hariyanti DF, Kurnia DP, Fauziah LF. Perbedaan Penurunan Kadar Gula Darah pada Kelompok Yang Diberi Terapi Jus Buah Naga Merah dan Bengkuang pada Penderita DM di Komunitas Gres Lansia Kabupaten Tuban. Sehat Rakyat J Kesehat Masy. November 2023;2(4):540–8.
24. Khairunnisa NAT, Wulandari PY. Peran Resiliensi Terhadap Quarter Life Crisis Pada Dewasa Awal. J Syntax Fusion. November 2023;3(11):1183–97.
25. Arifuddin NF, Hardi I, Kalla R. Faktor Yang Mempengaruhi Terjadinya Kecelakaan Kerja Pada Perawat Di Rumah Sakit Dr. Tajuddin Chalid Makassar. J Muslim Community Heal. November 2022;4(2):1–14.
26. Bastanta HI, Khadafi M. Tingkat Pengetahuan Pasien Diabetes Mellitus Terhadap Faktor Risiko Ulkus Diabetikum di RSUD dr. Pirngadi Medan. J Ilm Simantek. 2021;5(2):42–5.
27. Amran, Zaenal S, Haskas Y. Hubungan Dukungan Keluarga Terhadap Manajemen Diet 3j Pada Pasien Diabetes Melitus Tipe 2. JIMPK J Ilm Mhs Penelit Keperawatan. Januari 2024;3(5):62–70.
28. Watta R, Masi G, Katuuk ME. Screening Faktor Resiko Diabetes Melitus Pada Individu Dengan Riwayat Keluarga Diabetes Melitus di RSUD Jailolo. J Keperawatan. Mei 2020;8(1):44–50.
29. Farida U, Walujo SD, Mar'atina NA. Hubungan Tingkat Pengetahuan Diabetes Mellitus Terhadap Kadar Gula Darah Pasien Diabetes Mellitus di Puskesmas X. Indones J Pharm Educ. Maret 2023;3(1):125–30.
30. Trisnadewi NW, Adiputra IMS, Mitayanti NK. Gambaran Pengetahuan Pasien Diabetes Mellitus (DM) Dan Keluarga Tentang Manajemen DM Tipe 2. Bali Med J. Desember 2018;5(2):165–87.
31. Febrianti F, Septiawan T. Hubungan Tingkat Kecemasan dengan Kadar Gula Darah pada Penderita Diabetes Melitus Tipe 2 Studi literature review. Borneo Student Res [Internet]. 2022;3(2):1135–47. Tersedia pada: https://journals.umkt.ac.id/index.php/bsr/article/view/2793
32. Jeharut AF, Hepilita Y, Daar GF. Literatur Review : Hubungan Kecemasan Dengan Kadar Gula Darah Pada Penderita Diabetes Melitus Tipe 2. J Wawasan Kesehat [Internet]. 2021;6(1):48–54. Tersedia pada: https://stikessantupaulus.e-journal.id/JWK/article/view/117
33. Maulasari Y. Tingkat Kecemasan pada Penderita Diabetes Melitus Tipe 2. HIGEIA (Journal Public Heal Res Dev. 2020;4(Special 3):660–70.
34. Imelda SI. Faktor-Faktor yang Mempengaruhi Terjadinya Diabetes Melitus di Puskesmas Harapan Raya Tahun 2018. Sci J. 2019;8(1):28–39.