

THE RELATIONSHIP BETWEEN ANXIETY IN PATIENTS WITH DIABETES MELLITUS AND INCREASED BLOOD SUGAR LEVELS IN THE WORKING AREA OF THE TANAH JAVA HEALTH CENTER, SIMALUNGUN DISTRICT, 2020

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Abstract

Diabetes mellitus can cause complications that affect all organs in the body. Anxiety is a response to the disease that is felt by the sufferer as pressure, discomfort, anxiety, disappointment because they are tired of the medication regulations that must be carried out resulting in the patient's blood sugar levels not being controlled properly. blood sugar levels in the working area of the Tanah Jawa Community Health Center, Simalungun Regency in 2020. The research design is This type of research is cross-sectional conducted in August - October 2020. The population and sample in this study were all diabetes mellitus patients in the work area Tanah Jawa Community Health Center, Simalungun Regency, in 2020, namely as many as 30 people. The results of the study showed that the majority of respondents experienced moderate anxiety, namely as many as 12 people, while a minority experienced severe anxiety, namely as many as 2 people, the majority of respondents experienced increased blood sugar levels, namely as many as 24 people, while the minority did not experience increased blood sugar levels, namely as many as 6 people. From the results of the chi-square test, the cross-table of knowledge and attitudes obtained a p-value of $0.009 < 0.05$. It can be concluded that anxiety has an influence on increasing blood sugar levels in people with diabetes mellitus in the working area of the Tanah Jawa Health Center, Simalungun Regency, in 2020. This research can provide guidance and motivation for diabetes mellitus clients in controlling blood sugar levels and provide additional information for patients and families implementing prevention and control

Keywords: Anxiety, Increased Blood Sugar Levels

INTRODUCTION

Diabetes Mellitus (DM) is a metabolic disease resulting from impaired insulin secretion, impaired insulin action, or both (American Diabetes Association (ADA), 2014). The presence of these disorders results in sugar in the blood being unable to be used by the body's cells as energy, which in turn causes high blood sugar levels. in high blood pressure or hyperglycemia (International Diabetes Federation (IDF), 2013). Increased blood sugar levels will cause various complaints such as polyphagia, polydipsia and polyuria. Polyphagia is excessive hunger caused by cells in the body not getting energy. Polyuria is excessive frequency of urination, while polydipsia is excessive thirst (Arisman, 2010).

Data (WHO), suggests that the number of Diabetes Mellitus clients in Indonesia in 2000 reached 8.43 million people and is estimated to reach 21.257 million people in 2030. Even at this time the prevalence of Diabetes Mellitus in Indonesia ranks fourth in the world after India, China and the United States. (MOH RI, 2012).

The prevalence of DM sufferers in the world is currently around 382 million people

and is feared to increase by 55% to 592 million people in 2035 (IDF, 2013). According to the IDF in 2013, there are 10 countries with the largest population of diabetes. China ranks first with 8.5 million sufferers which is predicted to be 14.1 million in 2035. Based on research results in 2013 in Indonesia there were 2.1%DM sufferers, whereas in 2007 the prevalence was 1.1%. This has shown an increase in the prevalence of DM (Riskesdas, 2013).

Diabetes mellitus is the cause of death 4-5 times compared to other diseases in developing countries. From year to year, people with diabetes mellitus continue to increase, until now there are 177 million sufferers in the world, and in 2025 it is estimated that there will be an increase of 300 million people with diabetes mellitus. WHO states that there will be an increase in diabetes mellitus sufferers, especially in ASEAN countries in the 21st century (Muslim, 2014).

According to Riskesdas (2013), the prevalence of diabetes mellitus in Indonesia in 2013 was 2.1%. Of the several provinces in Indonesia, the highest prevalence was in the province of South Sulawesi, which was 3.4%. It is estimated that in 2030 there will be an increase of 21.3 million people, because of this Indonesia is in fourth place. The prevalence of diabetes mellitus in Central Java province is also not much different from what is happening nationally. In 2015 the highest cases of diabetes mellitus were in Demak district, with the number of non-insulin dependent diabetes mellitus of 13,435 people (Central Java Provincial Health Office, 2015).

Based on data from the Demak District Health Office in 2015 cases of non-insulin dependent diabetes mellitus were ranked second after essential hypertension. The number of people with diabetes mellitus in 2014 was 3,204 people. In 2015 cases of non-insulin dependent diabetes mellitus increased by 17,442 people. The highest prevalence of non-insulin dependent diabetes mellitus cases is located at the Bonang I Health Center with 1,250 old cases and 974 new cases (Demak District Health Office, 2015).

Type 1 diabetes is diabetes caused by absolute insulin deficiency due to damage to pancreatic P cells. Meanwhile, type 2 diabetes is a condition where the amount of insulin is sufficient, but cannot be used or resistance occurs (ADA, 2014). Type 2 DM is the largest contributor, around 90% -95% of those with diabetes (ADA, 2011). In Central Java, there are 0.06% type 1 DM sufferers and 0.55% type 2 DM sufferers. In Salatiga, there were 1,115 cases of type 1 DM and 9,104 cases of type 2 DM (Dinkes, 2012). Based on data obtained from the medical records section of the Salatiga Hospital, there were 143 type 2 DM outpatients from January to March 2014.

Diabetes mellitus can cause complications that affect all organs in the body. If this disease is not controlled properly it will result in an increase in blood glucose levels (hyperglycemia). Hyperglycemia can cause various complications, namely metabolic complications such as diabetic ketoacidosis; microvascular complications such as kidney and eye disease; complications of neuropathy such as neurological disease; as well as macrovascular complications, namely myocardial infarction, stroke and peripheral vascular disease. To prevent these complications, clients must comply with the four pillars of management including health education, meal planning or diet, regular physical exercise

and medical therapy for life.

Complications that occur in diabetes mellitus result in physical, psychological, and social changes. One of the psychological changes that commonly occur is anxiety in people with diabetes mellitus. Several things that cause anxiety include low level of knowledge about diabetes mellitus, lack of information about diabetes mellitus from health workers, pressure from doctors, and lack of rest time. Anxiety is a response to the disease that is felt by the sufferer as pressure, discomfort, anxiety, disappointment because they are tired of the medication regulations that must be carried out so that the patient's blood sugar level cannot be controlled properly (Taluta, Mulyadi, & Hamel, 2014).

Anxiety experienced by people with diabetes mellitus can result in changes in daily life and disruption of the hormone system in the body. However, not all sufferers are able to adapt and overcome this anxiety, so that anxiety becomes sustainable which can cause sufferers to experience depression (Novita, 2013).

The number of diabetes mellitus respondents who experienced mild and moderate levels of anxiety with adaptive coping mechanisms was 50% and maladaptive coping mechanisms were 6.25% while the level of severe anxiety with adaptive coping mechanisms was 12.5% and maladaptive coping mechanisms were 31.25% (Taluta, Mulyadi, & Hamel, 2014).

The results of Wiyadi's research (2012) found that there was a significant relationship between anxiety levels and blood sugar levels in DM clients. A good introduction to anxiety in DM clients is one of the efforts that needs to be done through a holistic approach). The results of the initial study found that there were more DM clients at the Bukit Hindu Health Center compared to other health centers in the city of Palangka Raya. This is what makes the authors interested in doing this research by focusing on the emotional condition of DM clients, namely anxiety. Prolonged anxiety in DM clients can increase blood sugar levels and even serious DM complications.

Research on the effect of anxiety on blood glucose levels in DM sufferers was previously conducted at the Banyuanyar Public Health Center in Surakarta in 2013. Murdiningsih and Ghofur's research used a sample of 34 DM sufferers in the area. The sampling technique used was total sampling, namely the entire population was included in the study. Data analysis in this study used the product moment correlation test or the Pearson test. The results of this study showed that there was a significant influence between anxiety and blood sugar levels in DM sufferers (Murdiningsih *et al*, 2013)..

Based on the background above, the researchers wanted to research the relationship between anxiety in patients with diabetes mellitus and increased blood sugar levels in the working area of the Tanah Jawa Community Health Center, Simalungun Regency, in 2020

LITERATURE REVIEW

Worry

Anxiety is an emotional state characterized by physiological arousal, an unpleasant feeling of tension and a feeling of apprehension or a state of worry that complains that something bad will happen soon (Suliswati, 2005). Stuart (2014) revealed that anxiety is an

emotional response to an assessment that describes a state of worry, anxiety, fear, unrest accompanied by various physical complaints.

This situation can occur in various life situations and illness disorders. In line with the statement of Suliswati and Stuart according to (Donsu, 2017) revealed anxiety is a non-specific symptom and autonomic nervous activity in response to ambiguity, non-specific threats that are often found and often a normal emotion.

Anxiety is common in people who suffer from chronic or genetic diseases. In diabetes mellitus with complications that can cause gangrene to amputation cause physical disability and require a long treatment (Kurniali, 2013). Diabetes mellitus requires regulation of diet, activity and treatment. Ignorance about diabetes mellitus will further increase the emotionality of sufferers related to relationships with other people. This will increase anxiety and change everything in his life (Novitasari, 2012).

According to Nevid (2005) there are several factors that can cause anxiety in a person, namely a foreign environment, loss of independence so that they experience dependence and need the help of others, separation from a partner or family, financial problems, lack of information, threats of more severe illness and treatment problem.

Diabetes mellitus

Diabetes Mellitus is a disease caused by high levels of sugar in the blood due to impaired insulin secretion and a complex chronic disease characterized by hyperglycemia due to impaired insulin secretion, insulin action, or both. The state of chronic hyperglycemia from diabetes mellitus is associated with long-term damage, impaired function and failure of various organs, especially the eyes, kidneys, nerves, heart and blood vessels (American Diabetes Association, 2017).

Diabetes Mellitus is a chronic (chronic) disease that occurs when the pancreas (stomach salivary glands) does not produce enough insulin or when the body does not effectively use insulin. Insulin is an important hormone that is produced in the pancreas gland of the body, and transports glucose from the bloodstream to the body's cells where it is converted into energy. Lack of insulin or the inability of cells to respond to insulin causes high blood glucose levels, or hyperglycemia, which is a hallmark of diabetes mellitus (International Diabetes Federation, 2017).

Blood Sugar Levels

Blood glucose is a term that refers to glucose levels in the blood whose concentration is tightly regulated by the body. Glucose that flows through the blood is the main source of energy for body cells. Generally the level of glucose in the blood remains within the limits of 4-8 mmol/L/day (70-150 mg/dl), this level increases after eating and is usually at its lowest level in the morning before people consume food (Mayes, 2009). Blood glucose levels vary throughout the day which will increase after eating and return to normal within 2 hours. Normal blood glucose levels in the morning after fasting the night before are 70-110 mg/dL blood. Blood glucose levels are usually less than 120-140 mg/dL at 2 hours after eating or drinking fluids containing glucose or other carbohydrates (Price, 2008).

Normal blood glucose levels tend to increase mildly but gradually after age 50, especially in sedentary people. An increase in blood glucose levels after eating or drinking stimulates the pancreas to produce insulin thereby preventing further increases in blood glucose levels and causing blood glucose levels to decrease slowly (Guyton, 2009).

METHOD

Method of collecting data

Data collection is a process of approaching the subject and the process of collecting the characteristics of the subjects needed in a study. The steps in data collection depend on the research design and the technical instruments that will be used in the research (Nursalam, 2008). This study used a questionnaire to collect data. That was done by the researchers themselves. Before the questionnaires were distributed to respondents, the researcher first explained the objectives, benefits and research procedures to be carried out and asked for their willingness to participate as research respondents. If the prospective respondent is willing, the respondent is asked to sign an agreement to become a respondent.

Types of research

This type of research is cross sectional, which is a research design by making observations at the same time (Hidayat.AA, 2009). This is intended to find out whether there is a relationship between anxiety in patients with diabetes mellitus and increased blood sugar levels in the working area of the Tanah Jawa Community Health Center, Simalungun Regency in 2020

Processing and analysis of data

1. Data processing

The collected data is then processed manually with the following steps:

- a. *Editing* is an activity to check and improve the contents of the questionnaire.
- b. *coding* is coding, namely changing data in the form of sentences or letters into numeric data or numbers.
- c. *Processing (data entry)* is the answer from each respondent in the code entered into the computer program.
- d. *Cleaning* is cleaning every data that has been entered, needs to be checked again to see the possibility of code errors, incompleteness, then corrections are made (Notoatmodjo, 2010).

2. Data analysis

- a. Univariate analysis

Univariate data analysis was carried out to describe the characteristics of each independent and dependent variable. Given the categorical data, the results of the analysis are presented in the form of a frequency distribution table.

b. Bivariate Analysis

Bivariate analysis was carried out to see whether there was a relationship between the independent variable (Anxiety) and the dependent variable (Increased Blood Sugar Levels) using a computer with the Chi Square statistical test or Chi Square (χ^2) table, where $\alpha = 0.05$, namely by the formula:

$$X^2 = \sum \frac{(fo - fe)^2}{fe}$$

$$fe = \frac{(\sum Baris)(\sum Kolom)}{Total}$$

Where:

fo = observation frequency

fe = expected frequency

RESULTS AND DISCUSSION

A. Results

1. Univariate analysis

This analysis is to obtain an overview of the frequency distribution of the variables studied. From the univariate analysis performed, the following results were obtained:

a. Demographic Data

Demographic data of respondents in this study include age, gender, education, occupation. To see the frequency distribution of the characteristics of the respondents in the Work Area of the Tanah Jawa Community Health Center, Simalungun Regency, see table 4.1.

Table 5.1. Frequency Based Distribution Respondent Demographic Data Associated with Anxiety in Diabetes Mellitus Patients with Increased Blood Sugar Levels in the Working Area of the Tanah Jawa Community Health Center, Simalungun Regency in 2020

No	Demographic Data	F	%
1	Age		
	36 – 45 Years	5	16,7
	46 – 55 Years	10	33,3

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	>55 Years	15	50.0
2	Gender		
	Man	13	43,3
	Woman	17	56,7
3	Education		
	SD	3	10.0
	JUNIOR HIGH SCHOOL	5	16,7
	SENIOR HIGH SCHOOL	15	50.0
	PT	7	23,3
4	Work		
	Farmer	4	13,3
	Trader	8	26,7
	Self-employed	7	23,3
	civil servant	5	16,7
	TNI/Polri	0	0
	Doesn't work	6	20.0

From table 5.1. above, it was found that the majority of respondents were >55 years old, namely 15 people, while the minority aged 36-45 years, namely 5 people. The majority of female respondents were 17 people, while the male gender minority were 13 people. The majority of respondents have high school education, namely as many as 15 people, while a minority of elementary school students, namely as many as 3 people. The majority of respondents work as traders, namely as many as 8 people, while the minority as farmers, as many as 4 people.

Table 5.2. Frequency Based Distribution Respondents' Anxiety Levels Related to Increased Blood Sugar Levels for Patients with Diabetes Mellitus in the Work Area of the Tanah Jawa Community Health Center, Simalungun Regency in 2020

No	Worry	F	%
1	There isn't any	6	20.0
2	Mild Anxiety	10	33,3
3	Moderate Anxiety	12	40.0
5	Severe Anxiety	2	6,7
6	Panic	0	0

From table 5.2. above it was found that the majority of respondents experienced moderate anxiety, namely as many as 12 people, while the minority experienced severe anxiety, namely as many as 2 people

Table 5.3. Frequency Based Distribution Increased Blood Sugar Levels of Respondents Related to Anxiety Levels of Diabetes Mellitus Patients in the Work Area of the Tanah Jawa Community Health Center, Simalungun Regency in 2020

N	Increased Blood Sugar Levels	F	%
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o			
1	Increase	24	80.0
2	Not Increasing	6	20.0

From table 5.3. above it was found that the majority of respondents experienced an increase in blood sugar levels, namely as many as 24 people, while the minority did not experience an increase in blood sugar levels, namely as many as 6 people

2. Bivariate Analysis

Bivariate analysis was carried out to see the relationship between the independent variables and the dependent variable. From the bivariate analysis using the chi-square test, the following results can be obtained:

Table 5.4. Cross Table of Anxiety Levels Associated with Increased Blood Sugar Levels in Patients with Diabetes Mellitus in the Working Area of the Tanah Jawa Community Health Center, Simalungun Regency in 2020

o	N	Anxiety Level	Blood Sugar Levels				Total	p-value
			Increase		Not Increasing			
			f	%	f	%		
1		There isn't any		6,7		13,3	6	0,009
2		Mild Anxiety	8	26,6	2	6,7	10	
3	12	Moderate Anxiety	12	40	0	0	12	
4	2	Severe Anxiety	2	6,7	0	0	2	
5	0	Panic	0	0	0	0	0	
		Total	4	80	20	20	100	

From the results of table 5.4. above it can be seen that of the 6 respondents (20%) who did not experience anxiety, 2 people (6.7%) experienced increased blood sugar levels while 4 people (13.3%) did not experience increased blood sugar levels. Of the 10 respondents (33.3%) who experienced mild anxiety, 8 people (26.6%) experienced increased blood sugar levels while 2 people (6.7%) did not experience increased blood sugar levels. Of the 12 respondents (40%) who experienced moderate anxiety, 12 people (40%) experienced increased blood sugar levels. Of the 2 respondents (6.7%) who experienced severe anxiety, 2 (6.7%) experienced increased blood sugar levels.

From the test results *chisquare* cross table of anxiety levels with increased blood sugar levels then obtained a p value of 0.009 < 0.05. It can be concluded that anxiety has an influence on increasing blood sugar levels in people with diabetes mellitus in the working area of the Tanah Jawa Health Center, Simalungun Regency, in 2020.

B. Discussion

In accordance with the research objectives and hypotheses proposed in this study. So the discussion of research results is directed at the relationship between the independent variable (anxiety level) and the dependent variable (blood glucose).

Based on the results of the Chi-Square test there is a significant relationship ($p = 0.009$) between the level of anxiety and blood sugar levels when between anxiety levels and blood sugar levels in respondents

According to Van Son et al, 2011 states that the emotional condition of DM sufferers reduces the quality of life, interferes with glycemic control and increases the risk of complications and increases mortality. According to Lane et al (2000) anxiety can increase blood sugar levels even though the significance of HBA1c is weak

Biological factors that play a role in this disorder are "neurotransmitters". There are three types of neurotransmitters that play a role in this disorder, namely, norepinephrine, serotonin, and gamma amino butyric acid or GABA. But the neurotransmitter that plays a major role in generalized anxiety disorder is serotonin. Whereas norepinephrine mainly plays a role in panic disorder. 17 Psychosocial factors also play a role in anxiety disorders, such as the environment which is very important for the occurrence of anxiety. The connection with the experience of separation in early childhood can also cause anxiety, especially separation from both parents. Bowlby's love theory suggests that this kind of separation leads to feelings of insecurity, which are reactivated in later life.

In the opinion of DM disease researchers can cause anxiety, especially those who are already chronic and complications arise, on the other hand anxiety in DM sufferers can increase sugar levels (hyperglycemia). For this reason, education for DM sufferers is needed to reduce anxiety levels and control blood sugar levels. Suggestions for research are 1). In the treatment of DM patients, psychological factors should also receive the same attention as physical factors. 2). Provide health education to DM patients to reduce anxiety levels so that blood sugar levels can be controlled. 3). For future research, the sample size should be larger. 4). It is necessary to educate DM sufferers in order to reduce anxiety levels and control blood sugar levels.

CLOSING

Conclusion

Based on the results of the research that has been carried out and described in the discussion that was exposed in the previous chapter, the researcher can provide the following conclusions:

1. The majority of respondents experienced moderate anxiety, namely as many as 12 people, while a minority experienced severe anxiety, namely as many as 2 people
2. The majority of respondents experienced an increase in blood sugar levels, namely as many as 24 people, while the minority did not experience an increase in blood sugar levels, namely as many as 6 people
3. From the results of the chi-square test, the cross-table of knowledge and attitudes

obtained a p-value of 0.009 <0.05. It can be concluded that anxiety has an influence on increasing blood sugar levels in people with diabetes mellitus in the working area of the Tanah Jawa Health Center, Simalungun Regency, in 2020.

Suggestion

1. For Respondents

This research can provide guidance and motivation for diabetes mellitus clients in controlling blood sugar levels and provide additional information for patients and families implementing prevention and control.

2. For health centers

Provide input and benefits for health service institutions, especially in nursing to improve services in the management of diabetes mellitus, especially in maintaining blood sugar levels within the normal range

3. For Educational Institutions

To add references to medical-surgical nursing in controlling blood sugar in the body by identifying anxiety in patients with diabetes mellitus and can be used as a tri darma form of higher education lecturers by providing counseling.

4. For Further Research

This research can also be used as a guide in conducting further research on anxiety in people with diabetes mellitus

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