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The Relationship of Anxiety Level with Sugar Levels Blood in People with Diabetes Mellitus Type 2 at Technical Implementation Unit of Melak Public Health Center

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Introduction: *Indonesia is ranked 7th in the world with 10.7 million people with diabetes. If this disease is not controlled properly, it will result in an increase in blood glucose levels (hyperglycemia) which can cause various complications, namely metabolic complications, microvascular complications, neuropathy complications and macrovascular complications.* ***Objective:*** *To determine the relationship between anxiety levels and blood sugar levels in patients with Type 2 Diabetes Mellitus at Technical Implementation Unit of Melak Public Health Center.* ***Methods:*** *The research design in this study was descriptive correlation using a cross-sectional approach. Determination of the sample using purposive sampling, with a sample of 56 respondents.* ***Result and Discussion:*** *The level of anxiety in the Technical Implementation Unit of Melak Public Health Center is in the high category (51.8%). Fasting blood sugar levels at Technical Implementation Unit of Melak Public Health Center in the high category (57.1%). The relationship between anxiety levels and blood sugar levels obtained p-value = 0.01 smaller than 0.05 then Ha is accepted and H0 is rejected, meaning that there is a relationship between anxiety levels and blood sugar levels in patients with Type 2 Diabetes Mellitus.* ***Conclusion:*** *There is a relationship between anxiety levels and blood sugar levels in patients with Type 2 Diabetes Mellitus at Technical Implementation Unit of Melak Public Health Center.*

Keywords: Diabetes Mellitus; Fasting Blood Sugar; Anxiety;

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Introduction

Diabetes Mellitus (DM) is a metabolic disease due to impaired insulin secretion, impaired insulin work, or both. DM is characterized by increased blood glucose levels resulting from abnormalities in insulin secretion, insulin sensitivity and both (ADA, 2017). Diabetes mellitus consists of four types, namely DM type 1 which is characterized by destruction of pancreatic beta cells due to autoimmune, type 2 diabetes mellitus the causative factor of type 2 DM is influenced by a combination of inadequate insulin production (deficiency), and the body's inability to respond to insulin (insulin resistance), gestational DM where there is glucose intolerance (hyperglycemia) that occurs during pregnancy, and other types of DM may occur due to other etiologies (ADA, 2017).

The International Diabetes Federation (IDF) estimates that there are at least 463 million people aged 20-79 years in the world suffering from ice diabetes in 2019, equivalent to a prevalence rate of 9.3% of the total population at the same age. The prevalence of diabetics in Indonesia has increased from 5.7% in 2007 to 6.9% or around 9.1 million people in 2013 (Ministry of Health RI, 2018). The latest data from the International Diabetes Federation (IDF) Atlas in 2019 shows that Indonesia is ranked 7th in the world with a total of 10.7 million diabetics. If not handled properly, the World Health Organization even estimates that the incidence offbeats in Indonesia will jump dramatically to 21.3 million people by 2030 (IDF, 2019). While the results of Rikesdas, (2018) by the Indonesian Ministry of Health, the prevalence of diabetes mellitus diagnosed by doctors is as much as (3.4%) in DKI and the second place, namely East Kalimantan andDIY itself is ranked third (Rikesdas, 2018).

High diabetes mellitus requires serious treatment both pharmacologically and non-pharmacologically. One of the managements for DM patients is to measure blood glucose levels directly. Blood levels are the simplest form of carbon hydrate absorbed into blood fluids through digestion. These blood glucose levels can increase after eating and will usually drop to the lowest value in the morning before the DM sufferer eats, blood glucose levels will be regulated through negative feedback maintaining balance in the body (Smeltzer and Bare, 2012).

Increased blood glucose levels can cause effects or complications that affect all people in the body. If the disease is not controlled properly it will result in increased blood glucose levels (hyperglycemia). Hyperglycemia can cause various complications, namely metabolic complications such as diabetic ketoacidosis; microvascular complications such as kidney and eye diseases; neuropathy complications such as neurological diseases; and macrovascular complications such as myocardial infarction, stroke, and peripheral vascular disease. To prevent such complications, people with diabetes adhere to four pillars of management including health education, meal or diet planning, regular physical exercise, and lifelong medical therapy. Compliance with these regulations can cause psychological disorders such as anxiety for clients, so many fail to comply with them (Risnasari, 2014).

Anxiety conditions accompanied by increased blood glucose levels have a close relationship and can result in a decrease in a person's condition, where the condition also

adds to anxiety. Anxiety is a feeling of uncertain discomfort or anxiety accompanied by an autonomous response; a feeling of fear caused by anticipation of danger. This is a vigilance gesture that warns the individual of danger and prompts the individual to act in the face of a threat (Smeltzer and Bare, 2012).

Anxiety in people with diabetes will affect blood glucose fluctuations despite efforts on diet, physical exercise, and the use of drugs. UKPDS (*United Kingdom Prospective Diabetes Study*) found that over time blood glucose levels of people with diabetes are observed to continue to increase progressively, even though interventions have been carried out through lifestyle changes, diet, exercise and medication (Laudina, 2017). Research conducted by Syari'ati, (2015) shows that there is a relationship between anxiety and blood sugar levels of people with type 2 diabetes. That means the higher the anxiety, the higher the blood sugar levels. Similarly, Ati's research, (2014) shows there is a relationship between anxiety and blood sugar levels in Diabetes Mellitus patients. This result is in line with Andrean's research, 2020) that there is a relationship between anxiety levels and blood sugar levels in type 2 Diabetes Mellitus patients.

Researchers have conducted a preliminary study conducted in the Working Area of the Technical Implementation Unit of the Melak Public Health Center showing that Diabetes Mellitus is one of the most common diseases of the top 10 diseases in the Public Health Centre. When interviews were conducted on 10 DM patients, 8 patients experienced anxiety, 3 of whom experienced mild anxiety and 5 experienced moderate anxiety. They said they were worried about unstable blood sugar levels and the risk of complications they might experience, with complaints: insomnia, sometimes heart palpitations and fatigue.

Method

The study design is descriptive of correlation with *a cross-sectional approach.* This research will be carried out by saplings at the Technical Implementation Unit of the Melak Public Health Center, carried out in February-April 2022.

The population in this study is all patients diagnosed positive for type 2 Diabetes Mellitus in the Technical Implementation Unit of the Melak Public Health Center in October 2021 - December 2021 with a total of 65 people.

The sampling technique in this study is *purposive sampling*, which is a data sampling technique based on certain considerations, namely the subject and object of research that has been determined by the researcher (Notoatmodjo, 2013). The sample size in this study was 56 patients and met the selection criteria included in the study until the total required subjects were met.

Results and Discussion

Result

1. Characteristics of Respondents

Table 1

Characteristics of Respondents

No.	Characteristic	Total	
		F	%
1	**Age**		
	Late elderly (56-65 years old)	6	10.7
	Early elderly (46-55 years)	29	51.8
	Late adult (36-45 years)	14	25.0
	Early adulthood (26-35 years)	7	12.5
	Total	**56**	**100**
2	**Gender**		
	Man	29	51.8
	Woman	27	48.2
	Total	**56**	**100**
3	**Education**		
	College	12	21.4
	SHS	26	46.4
	Century	12	21.4
	IT	6	10.7
	Total	**56**	**100**
4	**Work**		
	Self employed	20	35.7
	Farmer	14	25.0
	Housewives	10	17.9
	Civil Servants	12	21.4
	Total	**56**	**100**
5	**Income**		
	>3.5 million	8	14.3
	2.5-3.5 million	23	41.1
	1.5-2.5 million	14	25.0
	<1.5 million	11	19.6
	Total	**56**	**100**
6	**Having diabetes**		
	>5 years	2	3.6
	4-5 years	14	25.0
	1-3 years	32	57.1
	<1 year	8	14.3
	Total	**56**	**100**
7	**Complications of diabetes**		
	No complications	34	60.7
	Having complications	22	39.3
	Total	**56**	**100**

Source: Primary Data (2022)

The results of the study based on table 1 on the characteristics of respondents in the Technical Implementation Unit of the Melak Public Health Center showed that the most

age was 46-55 years or in the early elderly phase 29 people (51.8%), the most gender was male 29 people (51.8%), the last education was the most high school graduates 26 people (46.4%), the most engaged in work was as an entrepreneur 20 people (35.7%), The highest average income ranged from 2.5-3.5 million per month 23 people (41.1%), respondents who experienced the most diabetes in the range of 1-3 years 32 people (57.1%) and the most respondents who did not experience complications due to Diabetes Mellitus 34 people (60.7%).

2. Anxiety Level

Table 2
Anxiety Level

Anxiety Level	Total	
	F	%
Low	27	48.2
Tall	29	51.8
Total	**56**	**100**

Source: Primary Data (2022)

The results of the study based on table 2 on anxiety levels showed that the most were in the high category, which was as many as 29 people (51.8%).

3. Fasting Blood Sugar Levels

Table 3
Sugar Content from Fasting

Fasting Blood Sugar Levels	Total	
	F	%
Normal	24	42.9
Tall	32	57.1
Total	**56**	**100**

Source: Primary Data (2022)

The results of the study based on table 3 on fasting blood sugar levels showed that the most were in the high category, which was 32 people (57.1%).

4. The Relationship of Anxiety Level with Blood Sugar Levels in Type 2 Diabetes Mellitus Patients in the Technical Implementation Unit of the Melak Public Health Center

Table 4

The relationship of anxiety levels with blood sugar levels

Anxiety Level	Blood Sugar Levels						*P-Vrange*
	Normal		Tall		Total		
	f	%	*f*	%	*f*	%	
Low	16	28.6	11	19.6	27	48.2	0,01
Tall	8	14.3	21	37.5	29	51.8	
Total	**24**	**42.9**	**32**	**57.1**	**56**	**100**	

Source: Primary Data (2022)

The results of bivariate analysis based on table 4 on the relationship between anxiety levels and fasting blood sugar levels showed that the most was high category anxiety levels with high category fasting blood sugar levels 21 people (37.5%). Based on the results of the analysis conducted using the *Chi-Square* test, obtained the value of *ρ-value* = 0.01 smaller than the value of α = 0.05 or (0.00<0.05), that means there is a significant relationship between the relationship between anxiety levels and blood sugar levels.

Discussion

1. Characteristics of Respondents

The results of the study based on table 1 on the characteristics of respondents in the Technical Implementation Unit of the Melak Public Health Center showed that the most age was 46-55 years or in the early elderly phase of 29 people (51.8%). In line with the theory that in developing countries people with *diabetes mellitus* aged between 45-64 years where the age is still classified as very productive. Age is one of the factors that can affect health (Soedijono, 2013). Notoatmodjo, (2013) revealed in psychological and mental asp the level of thinking of a person is getting more mature and mature.

Explaining that the older a person is, the mental development process improves, but at a certain age the increase in the process of mental development is not as fast as when he was in his teens. The most gender is men 29 people (51.8%) both men and women, both have a risk for Diabetes mellitus (Laudina, 2017). The most recent education is high school graduates 26 people (46.4%), the most engaged jobs are as self-employed 20 people (35.7%), the highest average income ranges from 2.5-3.5 million per month 23 people (41.1%), respondents who are elderly Diabetes noodles were most in the range of 1-3 years 32 people (57.1%) and the most respondents who did not experience complications due to Diabetes Mellitus 34 people (60.7%).

Acute complications occur if a person's blood glucose levels rise or decrease sharply in a relatively short period of time. Blood glucose levels can drop dramatically if the sufferer is on a diet that is too strict. Large and sudden changes can be detrimental. Acute metabolic complications can be hypoglycemia, which is a condition with blood

glucose levels below normal values. Another metabolic complication that often occurs in diabetes is *diabetic ketoacidosis (DKA).*

Hyperglycemia, hyperosmolar, nonketotic coma (HHNK) are also acute metabolic complications of diabetes that often occur in older type 2 diabetics. Hyperglycemia causes hyperosmolarity, osmotic diuresis, and severe dehydration. Patients can become unconscious and die if this situation is not treated immediately (Harmanto, 2013). Chronic complications of type 2 diabetes involve small vessels (microangiopathy), medium blood vessels, and large blood vessels (macroangiopathy). Microangiopathy is a specific lesion in diabetes that attacks the capillaries and arterioles of the retina (diabetic retinopathy), renal glomerulus (diabetic nephropathy), peripheral nerves (diabetic neuropathy), and muscles and skin.

Macroangiopathy has a histopathological picture in the form of atherosclerosis. Ultimately, diabetic macroangiopathy will result in peripheral vascular insufficiency accompanied by *intermittent claudication* and gangrene in the extremities as well as cerebral insufficiency and stroke. If the affected are coronary arteries and aorta, it can result in angina and myocardial infarction (Dewi, 2014).

2. Anxiety levels with blood sugar levels in patients with Type 2 Diabetes Mellitus

The results of the study based on table 2 on anxiety levels showed that the most were in the high category, namely as many as 29 people (51.8%). In line with the theory that anxiety is strongly related to feelings of uncertainty and helplessness, here are four levels of golden tan (Suliswati, 2014), namely: light: anxiety is associated with tension experienced daily.

The individual is still alert and his perception expands, sharpening the senses. Can motivate individuals to be able to learn and be able to solve problems effectively and generate growth and creativity. Moderate anxiety: the individual is focused only on the thoughts that concern him, there is a narrowing of the perception field, can still do things with the direction given by others. Severe anxiety: the individual's perception is very narrow. His focus is on a specific analysis and cannot think about other things. All behaviors are meant to reduce anxiety and it takes a lot of command to focus on other areas. Panic: Biocontrol and attention are lost.

Because of the roller cont., it is not able to do anything even with commands. There is a motor increase. Reduced ability to relate to others, deviation of perception and loss of rational mind, inability to function effectively. Usually accompanied by personality disorganization (Suliswati, 2014). Anxiety is an emotional state without a specific object. Anxiety is triggered by the unknown and accompanies all new experiences, such as entering school, starting a new job, or giving birth to a child. Itis this characteristic of anxiety that distinguishes it from fear.

Anxiety is a feeling of fear of something happening caused by the anticipation of danger and is a signal that helps individuals to prepare to act in the face of a threat. The influence of demands, competition, and disasters that occur in life can have an impact on

physical and psychological health. One of the psychological impacts is anxiety or anxiety (Mustafa, 2016).

Researchers assume the level of anxiety is most in the high category because respondents are still less exposed to correct information about Diabetes Mellitus. The dominant feeling of anxiety is caused by guessing with his own fantasies, without knowing more about DM.

The results of the study based on table 3 on fasting blood sugar levels showed that the most were in the high category, which was as many as 32 people (57.1%). Type 2 DM is a metabolic disorder characterized by an increase in blood glucose due to decreased insulin secretion by pancreatic beta cells and / or impaired insulin resistance (Soedijono, 2013). According to the *American Diabetes Association*, the cause of type 2 diabetes is insulin resistance, which is a condition in which the total insulin receptors on the cell surface are reduced so that glucose cannot enter the insulin cells.

Insulin resistance can occur due to several risk factors, namely obesity, lack of physical activity, a diet high in fat and low in carbohydrates, and *a first degree of relative* DM or hereditary factors of DM (Perkeni, 2015). Specifically, common signs that commonly occur are frequent urination at night (*Polyuria*), feeling thirsty and drinking often (*polydipsia*), easily feeling hungry, having eaten a lot (*polyphagia*) and rapid and drastic weight loss.

The assumption of research on fasting blood sugar levels is most in the high category because residents pay less attention to their health. Lack of attention to diet, physical activity, and irregular checking into health services. When symptoms of hypergolic EMI have occurred, then the patient comes to health services, so that the examination of the patient's blood sugar levels is high and becomes a person with Diabetes Mellitus.

The results of bivariate analysis based on table 4 on the relationship of anxiety levels with fasting blood sugar levels showed that the most was high category anxiety levels with high fasting blood sugar levels of 21 people (37.5%). In line with the theory of Diabetes Mellitus (DM) is a metabolic disease due to impaired insulin secretion, impaired insulin work, or both (ADA, 2017). The existence of disorders causes sugar in the blood cannot be used by body cells as energy until finally causing high blood sugar levels hyperglycemia resulting in sufferers feeling anxious, worried to anxiety (IDF, 2019).

Assume the most researchers are high category anxiety levels with high fasting blood sugar levels, because the level of awareness of patients and families has not been so serious about health, still often eat foods that contain high glucose, consume carbohydrates at night and rarely exercise, resulting in increased blood glucose levels. Then the high anxiety comes from the internal and external factors of the patient. internal factors because patients do not get enough information about Type 2 Diabetes Mellitus. While external factors are people around the patient pay less attention and do not provide correct information to him, so that such conditions make patients feel anxious about his disease.

Based on the results of the analysis conducted using the *Chi-Square* test, obtained the value of *value* = 0.01 smaller than the value of α= 0.05 or (0.00<0.05), that means there is a significant relationship between the relationship between anxiety levels and blood sugar levels. This result is in line with Andrean's research, (2020) shows that there is a relationship between anxiety levels and blood sugar levels in type 2 Diabetes Mellitus patients. Similarly, Syari'ati, (2015) shows that there is a relationship between anxiety and blood sugar levels of type 2 DM patients at Salatiga Hospital. That means the higher the anxiety, the higher the blood sugar levels. These results are also in line with Ati's research, (2014) showing a relationship between anxiety and blood sugar levels in Diabetes Mellitus patients at DKT Yogyakarta Hospital.

Researchers assume there is a significant relationship between the relationship between anxiety levels and blood sugar levels, because anxiety can affect the hormonal system in our bodies, interfere with hormone performance and ultimately have an impact on the endocrine that regulates blood sugar levels, namely the pancreas gland. When the system hormone in the pancreas is disrupted, insulin is less effective in regulating blood sugar levels, resulting in hyperglycemia.

Conclusion

The conclusion of the results of this study is that there is a relationship between anxiety levels and blood sugar levels in patients with Type 2 Diabetes Mellitus in the Technical Implementation Unit of the Melak Public Health Center (v*alue* = 0.01).

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