

Anxiety and diet among elderly people suffering from diabetes mellitus in Banda Aceh, Indonesia: A correlational study



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ABSTRACT

Successfully managing diabetes over a long period is challenging and requires close monitoring of one's diet and lifestyle. However, mental health issues such as anxiety can make it difficult to manage diabetes effectively, especially in older people. This study aims to highlight the psychological challenges older people with diabetes face, emphasizing the importance of mental health in managing chronic illnesses. It explores how anxiety affects the eating habits of older individuals with diabetes. The study used a quantitative method and a descriptive correlational research design. It involved older people with diabetes mellitus, with about 300 participants selected through purposive sampling based on certain criteria. The study measured anxiety levels using the GAS questionnaire, which is highly reliable (0.93), and dietary patterns were assessed with the UK-DDQ, which has a reliability of 0.765. The findings show that most participants were female (62%), in their early elderly years (89.7%), and had finished high school (67.7%). Regarding income, 39.3% earned less than Rp. 1,500,000. Over half lived with a partner (51%) and felt sadness and depression (64%). A minority had no family history of diabetes (38.3%), and most were cared for by their children (54.3%). Most participants had been living with diabetes for 2-5 years (54.1%) and did not smoke (85%). In terms of treatment, the majority used metformin (73.7%), and just over half did not use traditional medicine (51.3%). The study found a significant link between anxiety and diet in older adults with diabetes mellitus, with a p-value of 0.006 (alpha = 0.05). It suggests that healthcare providers should consider the whole well-being of older adults with diabetes, recognizing that anxiety can hinder their ability to follow a diet plan. Therefore, it is crucial to understand a patient's mental, emotional, and physical health for effective treatment.

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1. Introduction

The aging population in Indonesia has been steadily increasing over time, a trend attributed to advances in mortality rates and global improvements in life expectancy. As of 2019, the country's elderly population is 2.7 million, accounting for 10% of the total population. This trend is a positive indication of improving quality of life. However, it also means that older people are a vulnerable population, as they are more susceptible to various health problems that can arise due to

declining physiological, cognitive, mental, and social functions (Andri et al., 2019).

One of the most common health issues facing older people is Diabetes Mellitus (DM). DM is a group of metabolic diseases that results in hyperglycemia caused by defects in insulin secretion, insulin action, or both. DM also leads to disturbances in the metabolism of carbohydrates, fats, and proteins due to a deficiency of the hormone insulin (American Diabetes Association, 2014). According to the World Health Organization, in 2014, 8.5% of adults aged 18 years and older had DM, the leading cause of 1.5 million deaths in 2012. Indonesia had around 9.1 million people with DM in 2014, making it the fifth-highest number of cases globally.

Managing DM is an ongoing challenge that requires consistent care and attention. Patients can often experience boredom, anxiety, and frustration throughout the process. Motivation from within and outside is essential to manage this condition

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successfully. Research has shown that DM patients report a 20% higher anxiety level than those without the condition. This anxiety is often linked to hyperglycemia, or high blood sugar levels, in DM patients (Tsenkova et al., 2012). Prolonged hyperglycemia can damage various organs, making it crucial to maintain healthy blood sugar levels and seek medical attention when necessary. As a chronic metabolic disorder, DM poses a significant risk to sufferers due to the inability of their bodies to produce enough insulin or retain the insulin produced (Soewondo and Pramono, 2011). This condition leads to elevated blood sugar levels and the associated risk of complications, often resulting in anxiety and emotional distress among individuals affected by this disorder.

It is important to note that anxiety disorders can worsen the condition of people with DM. Anxiety can stimulate the pituitary hypothalamus to release ACTH hormone, which triggers the adrenal glands to release epinephrine and cortisol (Jeharut et al., 2021). This situation increases blood sugar levels despite efforts to diet, exercise, and take medication (Butcher, 2011). Uncontrolled blood sugar levels can contribute to various complications in DM sufferers, such as diabetic ketoacidosis, non-ketotic hyperosmolar hyperglycemia, vascular disorders, and diabetic neuropathy. Over time, chronic DM can cause dysfunction of various organs, such as the eyes, kidneys, nerves, heart, and blood vessels, eventually leading to death (Ludiana, 2017).

Reduced neurotransmitter function during emotional and mood changes can increase anxiety risk among older individuals (Nurhayati, 2020). Anxiety can manifest as feelings, behaviors, and physiological responses, affecting endocrine functions and harming blood glucose control (Butcher, 2011). For older individuals with DM, managing their condition and fear of the disease process can lead to anxiety disorders. One of the most crucial aspects of diabetes management is diet, but changes in eating habits can cause stress and anxiety, affecting blood sugar level control.

According to recent studies, individuals with DM are prone to experiencing anxiety, with a recorded percentage of 65.7% (Saleh et al., 2020). It happens due to the prolonged high blood sugar levels that can cause damage and complications in the body, leading to anxiety. Anxiety can further elevate blood glucose levels, as found in a separate study. Implementing anxiety management techniques and updating diet habits are vital to prevent increased blood sugar levels (Sitompul and Wulandari, 2021). With these findings in mind, this study aims to explore the connection between anxiety and eating patterns among older adults with DM.

Previous literature searches have yet to produce any research that compares the relationship between anxiety and dietary patterns in DM patients in Aceh province, particularly among older adults. It reveals a critical need to enhance our comprehension of the psychological hurdles that older individuals with diabetes encounter and the

significant role mental health plays in managing chronic illnesses. To bridge this knowledge gap, researchers plan to conduct a comprehensive evaluation to investigate the correlation between anxiety and the dietary patterns of older adults with diabetes. Through this study, they aim to gain deeper insights into how diet may affect anxiety levels in this population. Ultimately, this research may pave the way for more focused interventions to enhance the mental health and well-being of older adults with diabetes.

2. Methodology

The research methodology employed in this study was correlative and descriptive, utilizing the Cross-Sectional Study approach to collect data. Data was collected through guided interviews with elderly respondents residing in the working area of the Primary Health Care (PHC) center located in the Baiturrahman Sub-District of Banda Aceh. In order to conduct a comprehensive study on this issue, the sample size has been calculated using the Slovin formula proposed by Nursalam (2007), which results in a sample size of 300 respondents. As for the health condition of the residents, it has been discovered that many of them suffer from DM. The sampling technique used purposive sampling, with inclusion criteria: Minimum age of 60 years, domiciled in Baiturrahman sub-district, has a Banda Aceh city ID card, and Diagnosed with DM type 2. The objective of these interviews was to gather detailed information about the health conditions of the elderly population in this region. The study aimed to gain a comprehensive understanding of various health-related factors that impact the lives of older people in this area.

After analyzing the correlation coefficients, it was found that all items in the questionnaire had a positive connection with each subscale of the Geriatric Anxiety Scale (GAS). The somatic subscale showed a correlation coefficient of 0.86, the cognitive subscale had a coefficient of 0.91, and the affective subscale had a coefficient of 0.92, all with a p-value of less than 0.1. Additionally, there was a positive correlation between each of these subscales. The UK-Diabetes and Diet Questionnaire (UKDDQ), which consists of 20 questions, has been proven to be valid and demonstrated high reliability with an Intraclass Correlation Coefficient (ICC) of 0.90 (ranging from 0.82 to 0.94) (England et al., 2020).

The data analysis used in this research involved utilizing univariate and bivariate analysis methods, which were used to present the data as a frequency distribution. Univariate analysis is a statistical method used to describe and summarize a single variable, while bivariate analysis examines the relationship between two variables. Before its implementation, the research study underwent a meticulous review process by the Faculty of Nursing Ethics Committee at Syiah Kuala University, referencing number 111120041022. This was done to ensure compliance with all ethical standards and

guidelines governing research in the field, such as informed consent, confidentiality, and privacy. Our team remains committed to upholding ethical values in research and accepts full responsibility for ensuring that the study was conducted fairly, respectfully, and safely for all participants involved.

3. Result

3.1. Demographic data of respondent

The study collected data from 300 respondents, specifically older adults with DM. Of the total participants, 186 respondents (62%) were female. Most participants were 60-70 years old, accounting for 269 respondents (89.7%). Additionally, the study revealed that the participants were generally low educated, with 203 respondents (67.7%) having graduated from high school. For a more detailed analysis of the results, please refer to [Table 1](#).

3.2. Anxiety level of older adults with DM

As the data in [Table 2](#) indicates, a substantial proportion of the study sample is affected by anxiety-related disorders. Specifically, 131 individuals, accounting for 43.7% of the sample, exhibit symptoms of minimal to mild anxiety, while 169 individuals, or 56.3% of the sample, experience moderate to severe anxiety. These results indicate the high prevalence of anxiety-related disorders and warrant further attention and resources towards addressing this issue.

3.3. Diet of older adults with DM

As per the statistical analysis presented in [Table 3](#), it is apparent that a considerable proportion of the participants, amounting to 90% of the total, have been adhering to a healthy eating pattern. This entails consuming a nutritionally balanced diet that caters to all the required nutrients in appropriate quantities. In contrast, a meager 10% of the respondents have been identified with unhealthy eating patterns, which may involve excessive processed or junk food or an unbalanced diet deficient in essential nutrients.

3.4. Correlation between anxiety and diet in older adult DM sufferers

Based on the findings from [Table 4](#), out of the 300 total respondents, 131 experienced minimal to mild anxiety, representing 43.6% of the responses. Of these individuals, 125 reported having a healthy eating pattern, accounting for 41.6%, while only six had an unhealthy one, making up 2%.

In contrast, 169 respondents reported experiencing moderate to severe anxiety, representing 56.3% of the responses. Among those with a healthy diet, 145 had an unhealthy eating pattern, representing 48.3% of the total responses,

while 24 respondents had an unhealthy eating pattern, accounting for 8%.

Table 1: Demographic data of elderly with DM (n= 300)

Data	Frequency	%
Gender		
Male	114	38
Female	186	62
Age		
60-70 years old	269	89.7
>70 years old	31	10.3
Education		
No School	9	3
Elementary School	11	3.7
Junior High School	27	9
Senior High School	203	67.7
College	50	16.7
Socioeconomic		
<Rp.1.500.000	118	39.3
Rp. 1.500.000	107	35.7
Rp. 1.500.000 - 2.500.000	51	17
Rp. 2.500.000 - 3.500.000	24	8
Residence status		
Alone	3	1
Son or Daughter	144	48
Partner	153	51
Sad and depressed		
Yes	192	64
No	108	36
Family history of DM		
None	115	38.3
Father	77	25.7
Mother	40	13.3
Siblings	68	22.7
Primary caregiver		
Couples	137	45.7
Son or Daughter	163	54.3
Long suffering DM		
< 1 year	43	14.3
2-5 years	162	54.1
6-10 years	82	27.3
11-20 years	13	4.3
Smoke		
No	255	85
Yes	45	15
Use of medical drugs		
Metformin	221	73.7
Amylodipine	79	26.3
Traditional medicine		
No	154	51.3
Yes	146	48.7
Use of insulin		
No	284	94.7
Yes	16	5.3

Table 2: Anxiety experienced by older adults with DM (n= 300)

No.	Anxiety level	Frequency	%
1.	Minimal-light	131	43.7
2.	Moderate-severe	169	56.3

Table 3: Diet of older adults with DM (n= 300)

No.	Dietary habit	Frequency	%
1.	Healthy	270	90
2.	Unwell	30	10

4. Discussion

According to the chi-square statistical test results, there is a notable correlation between anxiety and

eating habits in older adults with DM. The p-value of 0.006 ($\alpha = 0.05$) indicates significance. These findings align with Sitompul and Wulandari's (2021) research, which suggests that anxiety significantly impacts an individual's diet. As a result, it is vital to prioritize managing anxiety and diet to prevent blood sugar levels from increasing in DM patients.

Anxiety is commonly characterized by emotional instability, causing tension, fear, shaking, headaches, and high blood pressure (Satsangi and Brugnoli, 2018). Aging can heighten anxiety levels due to declining emotional and psychological functions, resulting in problems such as migraines or headaches.

Table 4: Correlation between anxiety and diet in older adults with DM (n=300)

Anxiety level	Dietary habit				P-value
	Healthy		Unwell		
	Frequency	%	Frequency	%	
Minimal-light	125	41.6	6	2	0.006
Moderate-severe	145	48.3	24	8	
Total	270	90	30	10	

Based on the findings of the GAS instrument research, it was observed that out of 300 respondents, 169 individuals, accounting for 56.3% of the total sample, exhibited moderate to severe anxiety levels. In patients with DM, anxiety can be attributed to several factors such as age, gender, education, socioeconomic status, history of DM, and duration of the disease. Prolonged periods of elevated blood sugar levels can result in severe health complications and organ damage, which may contribute to heightened anxiety levels in DM patients (Giri et al., 2018). Moreover, increased anxiety levels can potentially elevate blood glucose levels, further exacerbating the condition, as a study by Saleh et al. (2020) suggested. Artini's (2019) study provided evidence of the correlation between anxiety and blood glucose levels. Anxiety can seriously impede an individual's ability to manage their daily routine, such as food intake. Furthermore, anxiety can impact carbohydrate metabolism by increasing the release of the hormone epinephrine, leading to the breakdown of glycogen in the liver and causing hyperglycemia.

The prevalence of sadness and depression among patients with diabetes is a significant concern, with approximately 64% of patients experiencing such symptoms. Mental disorders like depression can harm managing the disease, as evidenced in Table 1. This data can reduce patient motivation to adhere to their treatment plan, including dietary restrictions, medications, and exercise routines (Schmidt et al., 2020). Therefore, it is crucial to recognize and address any mental health issues that diabetes patients may face. Stress and emotional distress are closely associated with sadness and depression, and the stress of daily disease management can adversely affect blood sugar levels and overall quality of life (Saleh et al., 2020). As such, special attention must be paid to stress management and emotional support for diabetes patients. Research conducted by Kremic (2020) has shown that depression affects approximately 16.7% of diabetes patients, anxiety around 16.6%, and stress around 23.5%.

Notably, more than half of the patients (51%) had a partner at the time of their diabetes diagnosis. Suggests that having family support may be a critical factor in effectively managing the disease. The

support and encouragement of loved ones can motivate patients to stick to a healthy diet. Studies have shown that educating and supporting a patient's family can help alleviate the anxiety that often comes with dietary restrictions (Schmidt et al., 2020). Patients who live with a partner may experience less stress than those living with their children because they have emotional support and encouragement from their significant other (Schmidt et al., 2020). It is crucial to consider each patient's circumstances, as research by Anjani and Gayatri (2018) has found that family support is crucial for diabetic patients living with a partner. Additionally, over half of the patients (54.1%) had been living with diabetes for 2-5 years, which can impact their knowledge and ability to manage the disease. Patients who have been living with diabetes for an extended period may better understand the importance of a healthy diet, but they may also face challenges such as boredom with the same meal plan over time (Schmidt et al., 2020).

Moreover, it is essential to note that individuals who experience anxiety may have a physical response. Specifically, the hypothalamus-pituitary releases ACTH hormone, which affects the endocrine system. This hormone stimulates the adrenal glands to release hormones like epinephrine and glucocorticoids (cortisol) (Schimmer, 2011). As a result, cortisol and epinephrine levels in the blood increase, leading to processes like gluconeogenesis and glycogenolysis (Jeharut et al., 2021). These processes help to increase the energy required by the body during times of anxiety. Consequently, the liver releases glucose, and glycogen is converted into glucose, which increases blood sugar levels (Ludiana, 2017).

Blood sugar levels can become uncontrolled due to various factors, such as irregular eating habits, medication, frequent exercise, and psychological issues like stress and anxiety (Jeharut et al., 2021). Based on Table 3, most respondents (90%) maintain a healthy eating pattern influenced by gender. As 62% of the respondents are female, they take responsibility for regulating their daily diet. Additionally, 67.7% of respondents have completed high school education (SMA). However, a few respondents still eat unhealthily (10%). As a result, it is crucial to offer health education on managing a

proper and balanced diet to support optimal health, meet nutritional needs, and avoid an increase in blood sugar levels.

DM is a long-term condition that can be worsened by various risk factors such as physical inactivity, obesity, age, hypertension, smoking, alcohol consumption, psychological stress, and anxiety (Isnaini and Ratnasari, 2018). This study's findings are corroborated by expert opinions that suggest older individuals are more vulnerable to anxiety and depression due to their condition. DM will impair neurotransmitter function that regulates emotions, particularly in older adults, according to Nurhayati (2020). Furthermore, studies indicate that DM negatively affects coping mechanisms in some respondents (Jeharut et al., 2021). Older adults, in particular, are more prone to feelings of sadness and depression (64%/Table 1), accompanied by anxiety and stress, as they recognize that DM is a chronic disease and cannot be cured. As a result, they may feel that their lives are no longer meaningful and cannot meet their daily needs (Jeharut et al., 2021).

In addition, DM falls under the category of psychophysiological disorders, in which a physical ailment is intricately linked to a person's cognitive structure. Beyond the medical aspects of the condition, psychological factors also significantly influence the disease and its management. Notably, Madjidzadeh et al. (2017) have highlighted that various factors beyond the illness can impact an individual's overall well-being.

Hyperglycemia, or high blood sugar levels, can occur when the pancreas cannot produce insulin or insulin resistance develops. As a result, glucose cannot enter cells and accumulates in the bloodstream, as noted by Jeharut et al. (2021). Without access to glucose, cells lack energy and must turn to other sources, such as the liver or muscles, for glucose reserves through gluconeogenesis. This process breaks down glucose from fat, not carbohydrates, increasing blood sugar levels (Munir and Asnaniar, 2020).

Finally, it is common for those with chronic illnesses, including DM, to experience anxiety. A wealth of research conducted across various publications has identified several factors contributing to anxiety development among DM patients. These factors include changes in lifestyle, such as a decrease in physical activity or an unhealthy diet, as well as complications like neuropathy, retinopathy, and nephropathy. Notably, studies by Jeharut et al. (2021), Ludiana (2017), Madjidzadeh et al. (2017), and Wati et al. (2019) have each found that these factors can play a crucial role in causing anxiety in DM patients. As such, effective symptom management and complication prevention can be vital in reducing the risk of anxiety among those affected by DM. Individuals with diabetes are at risk of health complications due to their condition. However, effectively managing their diet and emotions can prevent these complications. Anxiety can be managed through various therapies, including medical and non-

medical approaches. Medical management involves anti-anxiety or anti-depressant drugs such as clobazam, diazepam, bromazepam, and oxazolam to alleviate symptoms. Non-medical therapies like support groups, social support, autogenic relaxation, and guided imagery can also help manage anxiety in diabetes patients. A recent study by Jeharut et al. (2021) has shown that these therapies effectively manage anxiety levels and prevent complications in diabetes patients.

5. Conclusion

The analysis of the study's 300 participants showed that most of them - 169 individuals, or 56.3% - were elderly with DM and had moderate to severe anxiety levels. In addition, 270 participants, accounting for 90% of the study's population, exhibited healthy eating habits. The study also revealed a statistically significant correlation (p -value = 0.006) between anxiety and diet for older adults with DM. It is crucial for healthcare providers, specifically nurses, to hone their skills as educators and facilitators to enhance the quality of care and promote better community health. It is particularly vital for those with DM who struggle with anxiety and have difficulty improving their dietary habits - especially elderly clients. Effective management of DM requires a comprehensive treatment plan that involves a team of medical professionals such as doctors, nutritionists, psychologists, and the patient's family members. It is essential to address the emotional impact of the condition, including feelings of sadness, depression, and stress management. It is crucial to educate patients and their families about the significance of maintaining a healthy diet. The treatment plan must be customized to the patient's experience and duration of suffering from DM to achieve better control over the disease and enhance their quality of life.

Compliance with ethical standards

Conflict of interest

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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