



## THE RELATIONSHIP BETWEEN ANXIETY AND EMOTIONAL REGULATION WITH BLOOD GLUCOSE LEVEL STABILITY IN TYPE 2 DIABETES MELLITUS POSYANDU ELDERLY PAGU KEDIRI REGENCY

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Article info	ABSTRACT
<p><b>Corresponding Author:</b> Sutik  <a href="mailto:grace2008sutik@gmail.com">grace2008sutik@gmail.com</a>            STIKES RS Baptis Kediri</p>	<p><i>Type 2 diabetes mellitus is a type of diabetes characterized by high blood sugar (glucose) levels due to persistent disturbances in carbohydrate, fat, and protein metabolism, which can lead to complications if not managed properly. This metabolic disorder is not only related to physiological factors but is also influenced by psychological factors. The purpose of this study was to determine the Relationship Between Anxiety and Emotional Regulation with Blood Glucose Level Stability in Type 2 Diabetes Mellitus Posyandu Elderly Pagu Kediri Regency. The design of this research is correlational analytic research with cross sectional approach. Population was Type 2 Diabetes Mellitus Patiens Posyandu Elderly Pagu Kediri Regency, using Purposive Sampling technique obtained a sample of 38 respondents. The independent variables studied were Anxiety and Regulation Emotion Level, while the dependent variable was Blood Glucose Level Stability in Type 2 Diabetes Mellitus Patiens. The instrument used was observation. The results were analyzed using the Chi square test (<math>\alpha = 0.05</math>)</i></p> <p><i>The results showed that Anxiety level based on the frequency distribution of respondents, almost all of whom had moderate anxiety, namely 18 respondents (47,4%); almost all of whom had moderate regulation emotion level, namely 16 respondents (42,1%); and almost all of whom had high blood glucose level stability, namely 21 respondents (55,2%). Based on data the results of the analysis using the Chi Square Test show that the p- value is less than <math>\alpha (0.05)</math>, because the p-value is <math>&lt;0.05</math>. This shows <math>p \text{ value} = 0.028 \leq \alpha = 0.05</math>, This shows <math>p \text{ value} = 0.017 \leq \alpha = 0.05</math>, so that <math>H_a</math> is accepted, and <math>H_o</math> is rejected. It can be concluded that the Relationship Between Anxiety and Regulation Emotion with Blood Glucose Level Stability in Type 2 Diabetes Mellitus Posyandu Elderly in Pagu Kediri Regency.</i></p> <p><i>The importance of the Several psychological interventions for glucose control, including emotional regulation therapy, have shown effectiveness in reducing HbA1c and diabetes-related distress, indicating that emotional management may be important part of glycemic control in people with Type 2 DM.</i></p> <p><b>Keywords:</b> Anxiety, Regulation Emotion, Blood Glucose, Level Stability, Diabetes Mellitus Type 2</p>
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### INTRODUCTION

Type 2 Diabetes Mellitus is a type of diabetes characterized by high blood sugar (glucose) levels due to persistent disturbances in carbohydrate, fat, and protein metabolism, which can lead to complications if not properly managed [1]. This metabolic disorder is not only related to physiological factors but is also influenced by psychological factors. Stress is

the body's response to certain demands and pressures that can disrupt a person's emotional and physiological state. Anxiety is an excessive and prolonged feeling of worry in response to real or imagined threats. Emotional regulation is an individual's ability to recognize, understand, manage, and adapt their emotional expression. Stable blood glucose levels are the body's ability to maintain glucose levels within a normal range under various physiological and psychological conditions. These three psychological factors have the potential to contribute to glycemic control in people with Type 2 DM [2].

Blood glucose stability in people with Type 2 DM is not solely influenced by biological factors such as insulin resistance or insulin secretion deficiency, but also by the patient's psychological condition [3]. Studies show that stress levels are positively correlated with uncontrolled blood sugar levels in DM patients, where increased stress increases the secretion of the hormone cortisol, which inhibits insulin function and stimulates gluconeogenesis, which increases blood glucose [4].

Anxiety related to uncertainty about disease control has also been reported to cause unstable blood glucose levels in people with Type 2 DM. Furthermore, emotional regulation skills are associated with patients' ability to manage diabetes distress and HbA1c control. Research studies show that weak emotional regulation skills are associated with higher HbA1c levels, suggesting that patients who struggle to regulate their emotions tend to have poor glycemic control [5].

Therefore, it is important to understand how stress, anxiety, and emotional regulation interact and influence blood glucose stability, so that a holistic intervention approach can be developed, including an integrated psychosocial approach and medical care. Increasing prevalence of Type 2 DM. Type 2 Diabetes Mellitus is a global health problem with increasing prevalence every year, including in Indonesia [6], [7]. High blood glucose levels are a key sign of this disease. Psychological factors are often overlooked in the management of this disease. The role of stress on blood glucose levels. Chronic stress is known to activate stress hormone responses, which impact blood glucose metabolism. Cortisol and catecholamines released during periods of chronic stress increase blood glucose levels and contribute to insulin resistance [8]. Anxiety as a psychological factor. High levels of anxiety in people with type 2 diabetes can influence disease management decisions and the body's physiological response to blood glucose levels. Anxiety related to high blood glucose measurements can trigger greater glucose fluctuations [9].

Difficulties in emotional regulation and glycemic control have been linked to diabetes distress, an emotional state specific to diabetes. Poor emotional regulation is associated with poor HbA1c control, which reflects long-term blood glucose stability. Several psychological interventions for glucose control, including emotion regulation therapy, have shown effectiveness in reducing HbA1c and diabetes-related distress, indicating that emotional management can be an important part of glycemic control in people with type 2 diabetes. Based on the above description, it appears that factors that can trigger blood glucose instability in patients with type 2 diabetes mellitus are stress or anxiety and emotion regulation [10]. Therefore, the researcher is interested in raising this issue with the title "The Relationship Between Anxiety and Emotional Regulation with Blood Glucose Level Stability in Type 2 Diabetes Mellitus Posyandu Elderly Pagu Kediri Regency"

## **METHOD**

Based on the objectives of this study, the design used is correlational analysis with a

cross-sectional approach, namely research that aims to determine the relationship between two or more variables with the data collection process that is only carried out once for each research variable. Data analysis uses the Chi-square statistical test, which is a research technique to determine the relationship, namely analyzing "The Relationship Between Anxiety and Emotional Regulation with Blood Glucose Level Stability in Type 2 Diabetes Mellitus Posyandu Elderly Pagu Kediri Regency". The Chi-square statistical test is used to analyze independent and dependent variables. The sampling technique uses non-probability sampling with purposive sampling. The number of samples is 38 respondents who meet the sample criteria, namely type 2 diabetes mellitus patients. This study was conducted at Posyandu Elderly Pagu, Kediri Regency. The researcher chose the title because he wanted to know, understand, analyze and provide knowledge to readers about The Relationship Between Anxiety and Emotional Regulation with Blood Glucose Level Stability in Type 2 Diabetes Mellitus Patients. This research variable Anxiety and Regulation Emotion are independent variables and Blood Glucose Level Stability in Type 2 Diabetes Mellitus as the dependent variable. Data collection using questionnaires and observation sheets [11].

## RESULT AND DISCUSSION

**Table 1 Characteristics of Respondents Based on Age, Gender and Education**

Characteristics	n	%
<b>Age</b>		
50-60 years old	11	29,0
61-70 years old	23	60,0
>70 years old	4	11,0
<b>Gender</b>		
Male	17	45,0
Female	21	55,0
<b>Education</b>		
Elementary, Junior High School	25	66,0
Senior High School	8	21,0
High Education (D3, D4, S1, S2)	5	13,0

Source: Primary data, 2025

Table 1 shows the characteristics of research respondents based on age, gender and education. In the age, gender, and education categories of respondents, the respective results showed that half of all respondents were aged 61-70 years, namely 23 respondents (60%), respondent gender female namely 55 respondents (55%), and for respondent education, half of all respondents had elementary school education, namely 25 respondents (60%).

**Table 2: Frequency Distribution Anxiety Level in Type 2 Diabetes Mellitus Patients**

Anxiety Level	n	%
Mild anxiety	14	36,8
Moderate anxiety	18	47,4
Severe anxiety	6	15,8

Source: Primary data, 2025

Table 2 shows results based on the frequency distribution of respondents, almost all of whom had moderate anxiety, namely 18 respondents (47,4%).

**Table 3 Frequency Distribution Regulation Emotion Level in Type 2 Diabetes Mellitus Patients**

Regulation Emotion	n	%
Mild	12	31,6
Moderate	16	42,1
Severe	10	26,3

Source: Primary data, 2025

Table 3 shows the results based on the frequency distribution of respondents, almost all of whom had moderate regulation emotion level, namely 16 respondents (42,1%).

**Table 4 Frequency Distribution Blood Glucose Level Stability in Type 2 Diabetes Mellitus Patients**

Blood Glucose	n	%
Low	6	15,9
Normal	11	28,9
High	21	55,2

Source: Primary data, 2025

Table 4 shows the results based on the frequency distribution of respondents, almost all of whom had high blood glucose level stability, namely 21 respondents (55,2%).

**Table 5 Analysis results of Chi square with Statistical test**

Chi-Square Tests			
	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	5.807 <sup>a</sup>	2	.028
Likelihood Ratio	6.365	2	.018
Linear-by-Linear Association	6.757	1	.021
N of Valid Cases	38		

a. 2 cells (33.3%) have expected count less than 5. The minimum expected count is .82.

Source: Primary data, 2025

Table 5 The results of the analysis using the Chi Square Test show that the p- value is less than  $\alpha$  (0.05), because the p-value is  $<0.05$ . This shows p value =  $0.028 \leq \alpha = 0.05$ , so that  $H_a$  is accepted, and  $H_o$  is rejected. It can be concluded that the Relationship Between Anxiety with Blood Glucose Level Stability in Type 2 Diabetes Mellitus Posyandu Elderly in Pagu Kediri Regency.

**Table 6 Analysis results of Chi square with Statistical test**

Chi-Square Tests			
	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	6.508 <sup>a</sup>	2	.017
Likelihood Ratio	7.662	2	.028
Linear-by-Linear Association	6.151	1	.019
N of Valid Cases	38		

a. 2 cells (33.3%) have expected count less than 5. The minimum expected count is .82.

Source: Primary data, 2025

Table 6 The results of the analysis using the Chi Square Test show that the p- value is less than  $\alpha$  (0.05), because the p-value is  $<0.05$ . This shows p value =  $0.017 \leq \alpha = 0.05$ , so that  $H_a$  is accepted, and  $H_o$  is rejected. It can be concluded that the Relationship

Between Emotional Regulation With Blood Glucose Level Stability in Type 2 Diabetes Mellitus Posyandu Elderly in Pagu Kediri Regency.

## **Discussion**

### **Anxiety Level in Type 2 Diabetes Mellitus Posyandu Elderly in Pagu Kediri Regency**

Anxiety levels in Type 2 Diabetes Mellitus patients at the Pagu Elderly Integrated Health Post (Posyandu Elderly) in Kediri Regency were found to be moderate, with 18 respondents (47.4%) reporting moderate levels.

According to the Kamus Besar Bahasa Indonesia (KBBI), anxiety is defined as a feeling of restlessness, worry, or fear about something that is unclear or uncertain. Anxiety is a subjective emotional response that generally arises when an individual faces a situation perceived as threatening, whether real or imagined [9]. In the context of health and nursing, anxiety is understood as a psychological reaction that can affect a person's physical condition, behavior, and social functioning. Theoretically, anxiety is viewed as an adaptive mechanism that functions to protect individuals from danger by increasing vigilance. However, if anxiety is excessive, persistent, or disproportionate to the trigger, it can be maladaptive and negatively impact health. Excessive anxiety can interfere with concentration, sleep quality, and an individual's ability to make decisions and carry out daily activities. Physiologically, anxiety is associated with activation of the autonomic nervous system, particularly the sympathetic nervous system, which triggers increased heart rate, blood pressure, and respiratory rate, as well as the release of stress hormones such as cortisol and adrenaline [8]. Prolonged activation can worsen health conditions, especially in individuals with chronic diseases, including metabolic disorders. Meanwhile, psychologically, anxiety is often characterized by feelings of restlessness, irritability, muscle tension, and recurring negative thoughts. In nursing practice, anxiety is a frequently encountered nursing problem and requires holistic intervention. Non-pharmacological approaches, such as health education, relaxation techniques, and emotional support, have been shown to be effective in helping reduce anxiety levels. Therefore, a comprehensive understanding of the concept of anxiety is crucial as a basis for planning and implementing individual-centered nursing care [12].

### **Regulation Emotion Level in Type 2 Diabetes Mellitus Posyandu Elderly Pagu Kediri Regency**

Emotional Regulation in Type 2 Diabetes Mellitus at Posyandu Elderly in Kediri Regency, revealed that the majority of respondents (16 respondents or 42.1%) had moderate emotional regulation.

Emotional regulation is an individual's ability to recognize, manage, and express emotions adaptively according to the demands of the situation. According to the Kamus Besar Bahasa Indonesia (KBBI), regulation is defined as "management," while emotion is an outpouring of feelings that develop and subside within a short period of time. Thus, emotional regulation can be defined as the process of managing outpourings of feelings to maintain them within personally and socially acceptable limits [13].

Theoretically, emotional regulation encompasses a series of conscious and unconscious processes that individuals use to influence the types of emotions they feel, when they arise, and how they are experienced and expressed. Gross (1998) explains that emotional regulation involves strategies that occur before emotions arise (antecedent-focused) and after emotions arise (response-focused). Effective strategies, such as cognitive reappraisal, have been shown to reduce the intensity of negative emotions, while maladaptive strategies, such

as expressive suppression, can increase psychological stress and physiological responses [14]. In a health context, emotion regulation plays a crucial role in an individual's psychological and physiological well-being. Individuals with strong emotion regulation skills tend to have lower levels of stress and anxiety, can make rational decisions, and exhibit adaptive behaviors in the face of stress. Conversely, failures in emotion regulation are often associated with psychological disorders, unhealthy behaviors, and unstable body responses, including changes in physiological parameters such as blood pressure and blood glucose levels. In nursing, emotion regulation is a crucial aspect of a holistic approach to patients. Nurses need to understand their patients' emotion regulation abilities as a basis for providing psychosocial interventions, health education, and adaptive coping support. Thus, emotion regulation not only plays a role in psychological balance but also contributes to maintaining overall health.

### **Blood Glucose Level Stability in Type 2 Diabetes Mellitus Patients Posyandu Elderly Pagu Kediri Regency**

Blood glucose level stability in Type 2 Diabetes Mellitus patients at the Pagu Elderly Health Post (Posyandu Elderly) in Kediri Regency revealed that most respondents had high blood glucose levels, amounting to 21 respondents (55.2%).

Blood glucose stability in Type 2 Diabetes Mellitus (DM) patients is a condition where blood glucose levels consistently remain within the normal range or recommended therapeutic target, both during fasting and postprandial periods. According to the Indonesian Dictionary (KBBI), stable means "constant, unchanging, and steady," so stable blood glucose levels reflect the body's ability to maintain glucose balance through controlled metabolic mechanisms. Type 2 DM is characterized by insulin resistance and relative insulin secretion impairment, which leads to chronically elevated blood glucose levels if not adequately managed. In theory, blood glucose stability is influenced by a complex interaction between nutritional intake, physical activity, adherence to pharmacological therapy, and hormonal and psychological regulation. Insulin plays a primary role in regulating glucose entry into cells, while counter-insulin hormones such as glucagon, cortisol, and adrenaline can increase blood glucose levels. In patients with type 2 diabetes, this hormonal imbalance is often exacerbated by a sedentary lifestyle, unhealthy diet, and psychological stress, which impact blood sugar fluctuations.

Blood glucose stability is also closely related to emotional regulation and stress levels. Chronic stress can activate the sympathetic nervous system and the hypothalamic-pituitary-adrenal axis, which increases cortisol secretion and ultimately raises blood glucose levels [15]. Therefore, type 2 diabetes management focuses not only on medical therapy but also on a holistic approach through education, stress management, and behavioral changes. In the nursing context, stable blood sugar levels are an important indicator of successful nursing care because they are directly related to the prevention of acute and chronic complications, such as hypoglycemia, hyperglycemia, neuropathy, and cardiovascular disease. Therefore, understanding the theory of blood sugar stability serves as a foundation for designing comprehensive, sustainable nursing interventions oriented toward improving the quality of life of patients with type 2 diabetes [16–18].

### **The Relationship Between Anxiety with Blood Glucose Level Stability in Type 2 Diabetes Mellitus Posyandu Elderly in Pagu Kediri Regency**

The results of the analysis using the chi-square test showed a p-value of  $0.028 < \alpha = 0.05$ , thus  $H_0$  was rejected and  $H_1$  was accepted, indicating a relationship between anxiety and blood glucose level stability in Type 2 Diabetes Mellitus at the Pagu Kediri Regency Elderly Posyandu.

According to the Kamus Besar Bahasa Indonesia (KBBI), anxiety is defined as a feeling of restlessness, worry, or anxiety about something unclear or uncertain. In a health context, anxiety is an emotional response that often occurs in individuals facing chronic diseases, including diabetes mellitus (DM) [18]. Diabetes mellitus is a chronic metabolic disease characterized by hyperglycemia due to impaired insulin secretion, insulin action, or both, requiring long-term and continuous management. In patients with diabetes mellitus, anxiety can arise as a reaction to the initial diagnosis, the demands of lifelong treatment, lifestyle changes, and concerns about acute and chronic complications such as hypoglycemia, nephropathy, neuropathy, and cardiovascular disease. This condition is exacerbated by the need for regular blood glucose monitoring, adherence to a diet, and the use of medication or insulin, which can cause prolonged psychological stress. Physiologically, anxiety activates the sympathetic nervous system and increases stress hormones such as cortisol and catecholamines. These hormone increases can trigger gluconeogenesis and insulin resistance, negatively impacting stable blood glucose levels. Therefore, anxiety not only affects the patient's psychological state but also contributes to uncontrolled metabolic status in people with diabetes mellitus. Behaviorally, unmanaged anxiety can reduce patient compliance with treatment regimens, including diet, physical activity, and medication use. Patients with high levels of anxiety tend to experience difficulties in self-care, potentially increasing the risk of complications and reducing quality of life. Therefore, the management of diabetes mellitus requires attention to psychological aspects, particularly anxiety, as an integral part of nursing care and holistic health services. A comprehensive approach involving education, emotional support, and psychosocial-based nursing interventions is expected to reduce anxiety levels and improve glycemic control in patients with diabetes mellitus.

### **The Relationship Between Regulation Emotion with Blood Glucose Level Stability in Type 2 Diabetes Mellitus Posyandu Elderly Pagu Kediri Regency**

The chi-square analysis showed a p-value of  $0.017 < \alpha = 0.05$ . Therefore,  $H_0$  was rejected and  $H_1$  was accepted, indicating a relationship between emotion regulation and blood glucose level stability in Type 2 Diabetes Mellitus Posyandu Elderly at the Pagu Kediri Regency.

Emotional regulation, according to the Kamus Besar Bahasa Indonesia (KBBI), is defined as an individual's ability to control, manage, and adjust emotional responses to remain adaptive to the situation at hand. In patients with diabetes mellitus (DM), emotional regulation is a crucial psychological aspect because the disease is chronic, requires long-term care, and demands high adherence to medication and lifestyle changes. This condition often triggers negative emotional responses such as stress, anxiety, frustration, and feelings of helplessness.

Theoretically, emotional regulation involves recognizing emotions, understanding their triggers, and choosing appropriate strategies to express or control them. Gross explains that emotional regulation can be achieved through various strategies, including cognitive reappraisal (positively reappraising a situation) and emotional suppression (suppressing the expression of negative emotions). In DM patients, the ability to perform cognitive reappraisal plays a crucial role in helping individuals accept their condition, increasing motivation for self-care, and maintaining psychological stability.

Impaired emotional regulation in DM patients can negatively impact glycemic control. Poorly managed negative emotions can trigger activation of the sympathetic nervous system and the release of stress hormones such as cortisol and adrenaline, which contribute to elevated blood glucose levels. Furthermore, the inability to regulate emotions can also decrease

adherence to diet, physical activity, and medication, thus worsening the patient's clinical condition. In the nursing context, emotional regulation is a crucial component of a holistic approach to DM patients. Nurses play a role in helping patients recognize emerging emotions, providing education about the relationship between emotions and blood glucose levels, and practicing adaptive emotional regulation strategies, such as relaxation, deep breathing techniques, and psychosocial support. With good emotional regulation, patients are expected to improve their quality of life, maintain metabolic stability, and prevent long-term complications from DM.

## CONCLUSION

Based on the results of the study conducted through questionnaires and observations through measuring blood sugar stability, the author concluded several things as follows: the level of anxiety shows results based on the frequency distribution of respondents, almost all of whom had moderate anxiety, namely 18 respondents (47.4%); almost all of whom had moderate regulation emotion level, namely 16 respondents (42.1%); and almost all of whom had high blood glucose level stability, namely 21 respondents (55.2%). The results of the analysis using the Chi Square Test show that the p-value is less than  $\alpha$  (0.05), because the p-value is  $<0.05$ . This shows  $p\text{-value} = 0.028 \leq \alpha = 0.05$ , This shows  $p\text{-value} = 0.017 \leq \alpha = 0.05$ , so that  $H_a$  is accepted, and  $H_o$  is rejected. It can be concluded that the Relationship Between Anxiety and Regulation Emotion With Blood Glucose Level Stability in Type 2 Diabetes Mellitus Posyandu Elderly in Pagu Kediri Regency.

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