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# Long Relationship of Suffering with Depression in Patients with Type 2 Diabetes Mellitus at Limboto Health Center

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**ABSTRACT**

Type 2 diabetes mellitus is a chronic disease that continues to increase and requires long-term management because it can cause various complications, including psychological disorders such as depression. Long suffering from the disease is one of the factors that can affect the patient's psychological condition. This study aims to analyze the relationship between the length of suffering and the incidence of depression in patients with type 2 diabetes mellitus at the Limboto Health Center.

The method of this study is quantitative with a correlational analytical design through a cross sectional approach. The population is all patients with type 2 diabetes mellitus which totals 1002 people, and a sample of 91 respondents with purposive sampling techniques. The instrument of this research is the Beck Depression Inventory (BDI-II) questionnaire. The data was analyzed using the Spearman Rank Test.

The results showed that the length of suffering was the most <5 years (54.9%) and the incidence of depression in patients with type 2 diabetes mellitus was categorized as minimal, so there was no relationship between the length of suffering and the incidence of depression. This research is expected to improve health services for patients with type 2 diabetes mellitus by conducting routine monitoring or screening, not only the physical condition but also the psychological condition of the patient.

## INTRODUCTION

Type 2 diabetes mellitus is a metabolic disease caused by insulin resistance and pancreatic beta cell dysfunction. The dominant lifestyle is the trigger of type 2 diabetes mellitus, namely diet and physical activity (Murtiningsih, Pandelaki and Sedli, 2021). Type 2 diabetes mellitus is the most common type of diabetes, accounting for about 90 percent of all registered cases. This type of diabetes is most commonly found in elderly individuals, but it is now increasingly common in children, adolescents, and younger adults. The main causes are increasing obesity rates, lack of physical activity, and an unhealthy diet (Demographics and Knowledge, 2025). Type 2 diabetes mellitus does not stand alone but has a relationship with several factors such as motivational factors, social factors, educational factors, economic factors, access to health services and psychological factors (M. Syahid, 2021)

Based on WHO data in 2025, around 3.4 million deaths are directly caused by diabetes every year. About 853 million people worldwide have diabetes mellitus, 1 in 8 adults are at high risk of developing type 2 diabetes mellitus. Diabetes is still a substantial public health problem. Type 2 diabetes mellitus, which is the leading cause of diabetes cases, is largely preventable and, in some cases, potentially reversible if identified and treated early. The most common is type 2 diabetes mellitus, usually in adults, which occurs when the body becomes resistant to insulin or does not produce enough insulin. In the last 3 decades, the prevalence of type 2 diabetes mellitus has increased dramatically in countries of all income levels, Recent data shows that people with type 2 diabetes mellitus make up more than 90% of all people with diabetes.

Type 2 diabetes mellitus is estimated to affect 463 million adults aged 20–79 years and is projected to reach 578 million people by 2030. Various epidemiological studies show that there is a tendency to increase the

incidence of type 2 diabetes mellitus in various parts of the world. The International Diabetes Federation (IDF) estimates in 2021 that 537 million adults aged 20-79 years worldwide have diabetes; This figure represents 10.5% of the world's population in this age group. The total number of people with type 2 diabetes mellitus is expected to increase to 643 million (11.3%) by 2030 and 783 million (12.2%) by 2045. Indonesia is ranked 5th out of 10 countries in the world with 19.5 million adult diabetics (20-79 years old) in 2021 and is predicted to remain ranked 5th out of 10 countries in the world with 28.6 million adult diabetics (20-79 years old) in 2045 (Soelistijo and Suastika, 2024). Specifically, Gorontalo Province itself experienced a fairly high spike in cases in 2022 with the number of people with diabetes mellitus increasing from 2,384 people to 23,950 people in 2023 (Gorontalo Provincial Health Office, 2025)

Based on a report by the Gorontalo Provincial Health Office in 2025, the highest incidence of diabetes mellitus is in Gorontalo Regency with a percentage of 3,332 cases, followed by Bone Bolango Regency with 1,533 cases, Gorontalo City with 1,097 cases, Boalemo Regency with 652 cases, North Gorontalo Regency with 537 cases, and finally Pohuwato Regency with 378 cases (Gorontalo Provincial Health Office, 2025). Based on this data, it can be seen that Gorontalo Regency has the highest percentage of diabetes mellitus incidence with a distribution of 778 cases at the Limboto Health Center, 482 cases at the Telaga Biru Health Center, 387 cases at the West Limboto Health Center, 299 cases at the Tilango Health Center, and 155 cases at the Telaga Jaya Health Center (Gorontalo Regency Health Office, 2025). Based on the data above, the Limboto Health Center ranks first in diabetes mellitus cases out of 23 health centers in Gorontalo district. The information collected in the medical records of the Limboto Health Center has decreased from 2024 to 2025 by 400 cases, so that there will be 1002 cases in 2025 from January to July with type 2 diabetes mellitus.

Type 2 diabetes mellitus is a chronic disease that has a negative impact on the physical and mental psychological of the sufferer. Physical disorders that occur such as polyuria, polydipsia, polyphagia, complaining of fatigue and drowsiness, besides that can experience blurred vision, weakness and headaches. The psychological impacts that occur include anxiety, anger, grief, shame, guilt, loss of hope, depression, loneliness, helplessness, can also become passive, dependent, feel uncomfortable, confused and feel suffering (Robertus Surjoseto and Devy Sofyanty, 2022)

Psychological problems in people with type 2 diabetes mellitus focus on depressive conditions. Depression is a condition that is often experienced by people with diabetes due to the demands of constant self-care, emotional burden, and adjustments to daily activities and social interactions. Depression is an important psychological problem to pay attention to in patients with type 2 diabetes mellitus because it can affect the overall success of disease management. Epidemiological data show that individuals with depression have a higher risk of developing diabetes than the general population. The two-way relationship between diabetes and depression illustrates that these two conditions affect each other and can worsen each other's circumstances. Depression is known to occur twice as often in people with diabetes, with more severe and recurrent symptoms, causing challenges in managing mental and physical health. Individuals with depression have a 32% higher risk of developing type 2 diabetes mellitus, which can worsen the prognosis as well as lower the patient's quality of life (Elnaem et al., 2025)

There are several signs and symptoms of depression in people with type 2 diabetes mellitus which include changes in several aspects such as cognitive, emotional, motivational, physical and vegetative aspects. From the four aspects above, people with type 2 diabetes mellitus often feel worthless, pessimistic, lose interest, easily sad or angry, and experience sleep and eating disorders. They also tend to be non-compliant with medication and lead unhealthy lifestyles. Biologically, depression is related to insulin resistance, beta cell dysfunction, chronic inflammation, and disorders of the hypothalamic-pituitary-adrenal system that can worsen the condition of diabetes (Firdausy and Amalia, 2024)

Depression in people with type 2 diabetes mellitus when left untreated can increase the risk of complications that are microvascular and macroscuular. Diabetes and depression can reduce a person's quality of life, and if they occur simultaneously it will have a more negative impact. Due to the adverse negative effects on health, the complications increase to reduce depression and better control diabetes. However, cases of depression often go undiagnosed and untreated in diabetic patients. Increasing awareness related to depression in diabetes needs to be increased (Firdausy and Amalia, 2024)

Factors that can affect depression in patients with type 2 diabetes mellitus are age, education, comorbidities, family support, impaired functional ability and long suffering from type 2 diabetes mellitus. Long suffering from type 2 diabetes mellitus is the main factor among several other factors that are important factors because patients who have suffered for a long time tend to ignore treatment, do not monitor blood sugar levels, and no longer adhere to diet and physical activity. People with type 2 diabetes mellitus with a shorter period of time have a lower level of depression than a long period of time. A person suffering from type 2 diabetes mellitus is required to carry out treatment and lifestyle changes. The length of time suffering from type 2 diabetes mellitus is grouped into < 5 years at risk of mild depression, 5-10 years at risk of moderate depression, and > 10 years at risk of severe depression (Nurfadila, Hastuti and Ayuningtyas, 2023)

Long suffering from type 2 diabetes mellitus is related to a chronic hyperglycemia condition that can alter the function and microvascular structure of the central nervous system so that it can cause a decrease in cognitive function. Prolonged suffering from type 2 diabetes mellitus and glycemic control are important in the pathogenesis

of decreased cognitive function in people with diabetes mellitus. Research conducted by Shaikh et al. (2019) on 57 patients with type 2 diabetes mellitus proves that the length of suffering from DM is an important factor in the pathogenesis of cognitive function decline because along with the increase in the duration of damage will also increase (Nugroho, Anggorotomo and Rafie, 2021)

Suffering for a long time can affect a person's level of depression as supported by research conducted at the Tanjung Pinang Health Center in 2022 showing that 2 people with type 2 diabetes mellitus who experienced depression > 5 years, namely 10 people (17.9%) experienced moderate depression and 2 people (3.6%) experienced type 2 diabetes mellitus < 5 years experienced mild to moderate depression. The length of time with diabetes mellitus is grouped into > 5 years with a risk of moderate depression, and < 5 years with a risk of mild depression (Anissa, Artiwi Putri and Mahatma, 2023). This is in line with research conducted at Karangasem Bali Hospital (2022) showing that long suffering can also affect a person's level of depression. People with type 2 diabetes mellitus with a duration of < 5 years have a low level of depression compared to those who experience > 10 years of severe depression (Pradana I putu, 2022)

Based on initial interviews conducted on October 3, 2025, with 5 patients who were treated on the way at the Limboto Health Center, 3 patients said they had suffered for more than 5 years, while 2 other patients had only suffered for less than 2 years. Patients who suffered longer admitted that they often felt bored and hopeless in undergoing treatment, while patients with shorter illness said they could still adapt to their condition. In addition, the two patients said that at the Limboto Health Center, there had never been an initial screening related to the patient's current psychological condition and there had been no special treatment for symptoms related to these psychological symptoms.

Based on some of the facts of the data obtained from the description of the problem above, the researcher is interested in taking the title "The long-term relationship between suffering and the incidence of depression in patients with type 2 diabetes mellitus at the Limboto Health Center"

## RESEARCH METHODS

This research was carried out at the Limboto Health Center on January 8-20, 2026. Types of quantitative research The research design used in this study is quantitative research with a cross sectional approach. Cross sectional research is a type of research that emphasizes the time of measurement/observation of independent and dependent variable data only once at a time. The data collection method in this study was carried out by giving a number of questions and/or written statements to respondents to be answered, with a sample of 91 respondents. This research instrument uses the Beck Depression Inventory (BDI) questionnaire

## RESEARCH RESULTS

### Univariate Results

### Characteristics of Respondents Based on Demographic Data

Table 1. Characteristics of Respondents by Age

| Yes | Age Group (years) | Frequency (n) | Percentage (%) |
|---|---|---|---|
| 1 | Early Adults (20-39) | 20 | 22,0 |
| 2 | Mature (40-59) | 42 | 46,2 |
| 3 | Early Elderly (≥60) | 29 | 31,9 |
| **Total** | | 91 | 100,0 |

Based on the table above, the characteristics of respondents based on age can be seen that most of the respondents are in the age group of 40-59 years, namely 42 respondents (46.2%). Meanwhile, the age group of 20-39 years is the group with the smallest number, namely 20 respondents (22.0%).

Table 2. Respondent Characteristics by Gender

| Yes | Gender | Frequency (n) | Percentage (%) |
|---|---|---|---|
| 1 | Male | 25 | 27,5 |
| 2 | Women | 66 | 72,5 |
| Total | | 91 | 100,0 |

Based on the table above, the characteristics of respondents based on Gender can be seen that the majority of respondents are female, namely 66 respondents (72.5%)

Table 3. Characteristics of Respondents Based on Education Level

| Yes | Education | Frequency (n) | Percentage (%) |
|---|---|---|---|
| 1 | SD | 69 | 75,8 |
| 2 | Junior High School | 9 | 9,9 |
| 3 | High School | 7 | 7,7 |
| 4 | College | 6 | 6,6 |
| **Total** | | 91 | 100,0 |

Based on the table above, the characteristics of respondents based on their last education can be seen that most of the respondents have an elementary school (SD) education level, which is as many as 69 respondents (75.8%). While the smallest is Universities with 6 respondents (6.6%).

Table 4. Characteristics of Respondents Based on Work

| Yes | Jobs | Frequency (n) | Percentage(%) |
|---|---|---|---|
| 1 | Housewives | 66 | 72,5 |
| 2 | Farmer | 21 | 23,1 |
| 3 | Self-employed | 2 | 2,2 |
| 4 | Not Working | 2 | 2,2 |
| **Total** | | 91 | 100,0 |

Based on the table, it can be seen that most of the respondents have jobs as housewives (IRT) as many as 66 respondents (72.5%). Meanwhile, the smallest respondents with self-employed and unemployed jobs amounted to 2 respondents each (2.2%).

Table 5. Characteristics of Respondents Based on Marital Status

| Yes | Marital Status | Frequency (n) | Percentage (%) |
|---|---|---|---|
| 1 | Married | 91 | 100,0 |
| 2 | Not Married | 0 | 0,0 |
| Total | | 91 | 100,0 |

Based on the table above, all respondents in this study had married status as many as 70 respondents (100%).

Table 6. Distribution of respondents based on length of suffering

| Yes | Long Suffering from DM | Frequency (n) | Percentage (%) |
|---|---|---|---|
| 1 | < 5 years | 50 | 54,9 |
| 2 | 5–10 years | 25 | 27,5 |
| 3 | > 10 years | 16 | 17,6 |
| Total | | 91 | 100,0 |

Based on the table, most of the respondents suffered from diabetes mellitus for <5 years, which was 50 respondents (54.9%). Meanwhile, the smallest respondents with a long period of suffering >10 years amounted to 16 respondents (17.6%).

Table 7. Distribution of Respondents Based on Incidence of Depression

| Yes | Incidence of Depression | Frequency (n) | Percentage (%) |
|---|---|---|---|
| 1 | Minimal | 76 | 83,5 |
| 2 | Lightweight | 10 | 11,0 |
| 3 | Medium | 5 | 5,5 |
| 3 | Weight | 0 | 0,0 |
| Total | | 91 | 100,0 |

Based on the table above, most respondents have a minimum depression of 76 (83.5%) and the least have moderate depression as many as 5 respondents (5.5%).

**Bivariate Results**

Table 8. The Long Relationship between Suffering and the Incidence of Depression in Patients with Type 2 Diabetes Mellitus at the Limboto Health Center

| **Long Suffering from DM** | **Minimal** | | **Lightweight** | | **Medium** | | **Total** | | **p-value** |
|---|---|---|---|---|---|---|---|---|---|
| | n | % | n | % | n | % | n | % | |
| < 5 years | 40 | 80,0 | 8 | 16,0 | 2 | 4,0 | 50 | 100 | **0,412** |
| 5–10 years | 22 | 88,0 | 1 | 4,0 | 2 | 8,0 | 25 | 100 | |
| > 10 years | 14 | 87,5 | 1 | 6,3 | 1 | 6,3 | 16 | 100 | |
| **Total** | 76 | 83,5 | 10 | 11,0 | 5 | 5,5 | 91 | 100 | |

Based on the table above, the bivariate analysis of the results of the statistical test using the Spearman Rank test showed a value of p = 0.412 (> 0.05) with a correlation coefficient of rs = -0.087, so it can be concluded that $H_0$ was accepted and $H_1$ was rejected, which means that there was no significant relationship between the length of suffering and the incidence of depression in patients with type 2 diabetes mellitus at the Limboto Health Center. Very weak correlation coefficient values and negative values indicate that length of diabetes mellitus is not meaningfully associated with increased or decreased incidence of depression.

**DISCUSSION**

**Long Suffering with Depression in People with Type 2 Diabetes Mellitus**

Based on the results of the study, it was shown that there was no significant relationship between the length of suffering and the incidence of depression in patients with diabetes mellitus, with a value of p = 0.412 (>0.05) and a correlation coefficient value of rs = -0.087. This shows that the relationship between the two variables is very weak and statistically meaningless. However, to understand the phenomenon that occurs in the field, it is necessary to have a more in-depth discussion based on the distribution of data in each category (per cell), so that it can describe the condition of the respondents more comprehensively.

**Long suffering <5 years**

Based on the results of the study, Lama suffers from type 2 diabetes mellitus at the Limboto Health Center mostly in the <5 year category, namely, as many as 50 respondents (54.9%). The results of the study show that the majority of respondents are still in the early stages of the journey of type 2 diabetes mellitus. This condition indicates that most of the respondents do not have long-term experience in managing their disease. Prolonged illness can affect the level of understanding, attitude, and behavior in the control of type 2 diabetes mellitus, including in terms of medication adherence, dietary regulation, physical activity, and complication prevention efforts. Thus, respondents who have suffered for a long time <5 years require special attention in the form of education and continuous assistance in order to be able to improve self-management skills and prevent complications in the future (Ilham et al., 2020)

According to the theory of disease progressivity put forward by Holman (1997), Type 2 Diabetes Mellitus is chronic and progressive, in which the function of pancreatic beta cells gradually decreases over time. In the early phases of the disease, for example, less than 5 years after diagnosis, the pancreas is still able to produce insulin even though the body begins to experience insulin resistance.

The results of this study are in line with research conducted by Sukarya et al. (2025) Type 2 diabetes mellitus, a phase of less than 5 years since diagnosis is often categorized as an early period of the disease in which metabolic changes such as insulin resistance and pancreatic beta cell dysfunction have begun to occur but clinical complications are not yet dominant. Observational research shows that patients with a duration of < of 5 years tend to have more normal health parameters such as albumin levels than patients with a duration of ≥ 5 years, although statistical differences for initial duration are not always significant. This initial phase is also a period that is more responsive to therapeutic interventions, where the chance of glycemic remission is higher than the longer duration (Sukarya, 2025). It is also supported by research conducted by Kim (2024), involving more than 2 million people with type 2 diabetes mellitus and grouping the duration of diabetes into several categories, including the duration of < 5 years (27.2% of the sample). The study showed that patients with shorter duration of diabetes typically had different clinical characteristics, such as higher fasting sugar levels in the new onset, compared to the longer duration group. These results provide an idea that the duration of < 5 years is an important phase in the clinical development of the disease, especially in response to glycemic control and metabolic status.

**Long suffering 5-10 years**

Based on the results of the study, it is known that respondents with the old category suffer from 5-10 years, namely, as many as 25 respondents (27.5%). These results show that respondents have had sufficient experience in undergoing and managing their illness in an intermediate period. According to Knowler's Theory (2002), it emphasizes that long-term suffering from type 2 diabetes mellitus is an independent risk factor for the appearance of chronic complications. In the 5–10 year phase, patients showed an increased risk of microvascular and macrovascular complications compared to the initial phase (<5 years), although this risk was still lower than that of patients who had suffered from >10 years. This shows that the duration of the disease is an important indicator to assess the progression of clinical conditions and determine the intensity of patient management so that complications can be minimized (Dewitte et al., 2002).

The results showed that patients in the 5–10 year duration group had a higher prevalence and degree of coronary artery disease compared to the <5-year duration, and the risk of cardiovascular complications increased with increasing disease duration. This is reinforced by measures such as coronary calcium scores, atheroma scores, and higher incidence of major adverse cardiac and cerebrovascular events (MACCE) in patients with longer disease duration.

Supported by international clinical research by Ostergaard (2019), the duration of suffering from type 2 diabetes mellitus correlates with an increased risk of complications both in terms of cardiovascular and infection. One study with a division of disease duration (<5 years, 5–10 years, and ≥10 years) showed that patients in the 5–10 year group had a higher prevalence of coronary disease and a heavier cardiac atheroma score than patients with a duration of less than 5 years, as well as an increased incidence of heart complications during long-term follow-up. Another study also found that a disease duration of 5–10 years was associated with a significantly higher risk of infective endocarditis than the shorter duration group. These findings support that the duration of the disease of 5–10 years is an important period in which diabetes complications are more common, especially when glycemic control is less than optimal.

**Long suffering >10 years**

Based on the results of the study, it is known that respondents with the old category suffer from >10 years, namely, as many as 16 respondents (17.6%).m This finding illustrates that some respondents have undergone a long course of illness for a long period of time, so they have the potential to have more experience and mature adjustments to their health conditions. However, a long duration of suffering does not automatically indicate that the management of the disease has been carried out optimally. There is still a possibility that aspects of blood sugar level regulation, adherence in undergoing treatment, the implementation of a proper diet, and the prevention of complications have not been implemented in a disciplined and sustainable manner.

The theory of the long-standing association of type 2 diabetes mellitus with an increased risk of complications was described by Turner et al. in a large UKPDS study published in the BMJ in 2000. According to Turner, prolonged exposure to hyperglycemia will progressively increase the risk of microvascular and macrovascular complications, and the risk is closely related to the length of the duration of the disease. In the analysis of UKPDS 35, it was found that every 1% increase in HbA1c levels was associated with a 35% increased risk of microvascular complications, as well as a 14% increased risk of myocardial infarction. This study confirms that the longer a person suffers from type 2 diabetes mellitus, especially more than 10 years, the greater the accumulation of vascular damage due to chronic glucose exposure, so that the duration of the disease becomes an independent risk factor for the development of long-term complications.

These results are in line with research conducted by Cendi Nurgajayanti et al (2024). This study analyzed the medical record data of 210 patients with type 2 diabetes mellitus and evaluated the relationship between patient characteristics, nutritional status, comorbidities, and length of suffering from diabetes mellitus with HbA1c levels as an indicator of glycemic control. The results showed that the long duration of suffering from type 2 diabetes mellitus correlated with higher HbA1c levels, reflecting poor glycemic control in patients who had lived with the

disease for a longer period of time. This study confirms that the duration of the disease, including those that have lasted more than 10 years, is an important factor in the evaluation of diabetes management and long-term complication risk, hence the need for comprehensive management strategies and individualized therapeutic approaches to lower HbA1c levels and prevent chronic complications.

The results of the research conducted at the Limboto Health Center showed that most of the respondents were still in the early phase of the disease journey, namely <5 years as many as 50 respondents (54.9%). This condition indicates that the majority of respondents are likely still in the process of accepting and adjusting to the diagnosis and lifestyle changes that must be undertaken.

The relatively short duration of suffering can have implications for the level of experience and understanding of respondents in managing the disease, including in terms of adherence to therapy, dietary regulation, physical activity, and regular monitoring of blood sugar levels. Meanwhile, respondents with a long period of 5–10 years and >10 years were less numerous, suggesting that the proportion of sufferers with long-term disease experiences was not dominant in the study. Thus, the researcher assumes that the majority of respondents still need to strengthen education and continuous assistance to improve self-management skills, so that the control of type 2 diabetes mellitus can be carried out more optimally and consistently.

**Incidence of Depression in Patients with Type 2 Diabetes Mellitus**

Based on the results of the research conducted at the Limboto Health Center, it shows that most of the respondents experience minimal depression, which can be seen from the data that out of 91 patients with type 2 Diabetes Mellitus, there were 76 respondents who experienced minimal depression, 10 respondents experienced mild depression and 5 respondents experienced moderate depression. These findings confirm that although the severity of depression in most patients is still mild, this mood disorder remains a significant psychological problem, as it can affect medication adherence, diet, physical activity, and blood sugar control. In addition, mild depression in patients with type 2 diabetes mellitus can also develop into a more serious condition if not received proper attention and intervention, so this study emphasizes the need for regular mental health monitoring, psychological support, and patient education on stress and depression management, to prevent worsening psychological conditions while improving patients' quality of life in the long term.

Based on the results of the study, it can be seen that most of the respondents are in the category of minimal depression, which is as many as 76 respondents (83.5%). This suggests that the majority of respondents do not experience significant depressive symptoms or only experience very mild symptoms. These findings indicate that the psychological condition of the respondents in general is still within normal limits, although there is still a possibility of the appearance of mild emotional symptoms. Minimal depression is usually characterized by feelings of sadness or lack of enthusiasm that appear occasionally, but do not significantly interfere with daily activities. This condition can be influenced by several factors, such as the individual's ability to manage stress, good social support from family and the surrounding environment, and relatively stable physical and psychological health conditions. In addition, the length of time a person suffers from an illness can also affect their psychological state, where individuals who are able to adapt to their illness tend to have lower levels of depression. Thus, the high proportion of respondents with minimal depression in this study shows that most of the respondents have a fairly good coping mechanism and adequate environmental support, thus being able to minimize the appearance of more severe depressive symptoms.

Respondents who experienced mild depression as many as 10 respondents (11.0%), showed that mild depression is a condition of mood disorders with symptoms such as feelings of sadness, loss of interest, and decreased energy, but individuals are still able to carry out daily activities, while respondents who experienced moderate depression as many as 5 respondents (5.5%), this shows that moderate depression is a condition with more severe symptoms, such as concentration disorders, decreased productivity, and disruption of social functions and daily activities. Meanwhile, there were no respondents who experienced severe depression (0.0%). Thus, it can be concluded that the majority of respondents in this study showed that most of the respondents were in the category of minimal depression.

According to Aaron T. Beck's theory, depression arises from a negative mindset known as the cognitive triad, which is a negative view of oneself, the environment, and the future. In people with diabetes mellitus, disease conditions that must be managed throughout life can give rise to negative thoughts such as feeling weak, feeling that their life is limited due to illness, or feeling that the future will worsen due to diabetes complications. Persistent negative mindsets can affect an individual's emotional state and ultimately trigger depression. A negative mindset can be influenced by various factors, one of which is the level of education.

Research conducted by Putri (2024) showed that there was a significant relationship between education level and self-care ability in people with diabetes mellitus ($p < 0.05$). Education level affects an individual's ability to understand health information, including how to manage diabetes. Diabetics with low education often experience limited knowledge about the disease and its treatment, making it more difficult to control the disease and more prone to stress and depression. In contrast, individuals with higher education usually have a better understanding of the disease so that they are able to manage diabetes better.

**Long-Term Relationship of Suffering with the Incidence of Depression in Patients with Type 2 Diabetes Mellitus**

Based on the results of the study on the relationship between long-term suffering and the incidence of depression in patients with type 2 diabetes mellitus conducted at the Limboto Health Center, the results of bivariate analysis of statistical tests using the Spearman Rank test showed a value of p = 0.412 (> 0.05) with a correlation coefficient of rs = -0.087, so it can be concluded that $H_0$ is accepted and $H_1$ is rejected, which means that there is no significant relationship between the length of suffering and the incidence of depression in the patient type 2 diabetes mellitus at the Limboto Health Center.

According to the Diathesis Stress theory, it is explained that depression arises through the interaction between individual vulnerability factors and stress from the environment or conditions faced. According to the concept of diathesis–stress, everyone has a certain level of vulnerability (biological, psychological, or social) to mental disorders, including depression. When individuals face prolonged chronic stressors such as long-term diabetes mellitus that requires ongoing treatment, lifestyle changes, risk of complications, and uncertainty of the prognosis the perceived stress burden will increase and may exceed the coping ability of the individual. If the stressful situation continues without support or effective coping strategies, then that vulnerability can develop into a depressive disorder.

This theory helps explain why the long duration of illnesses, such as diabetes mellitus that lasts for years, can increase the risk of depression in sufferers, as the stress resulting from these chronic conditions builds up over time and affects an individual's emotional balance

Research from Putri (2024), shows that depression is more often found in people with diabetes mellitus with a longer duration of the disease (>10 years) compared to those whose duration of the disease is shorter. In the study involving 122 patients aged 15–45 years, the prevalence of depression was quite high and related factors included low educational status and long-term diabetes. The results showed that patients with a longer duration of illness had higher rates of depression. As for the research conducted by Rinaldi, Martaria Rizky (2023) showed that there was no significant difference in the level of depression symptoms based on the length of time since diabetes diagnosis (t = 1.023; p > 0.05), which means that the duration of suffering from diabetes mellitus was not related to the level of depression in the patients in this sample. These findings are important because they suggest that other factors such as age, other health conditions, social support, or psychosocial factors may have a greater influence on the incidence of depression than the duration of the disease itself in the population of patients with type 2 diabetes mellitus. This study can be used as one of the scientific evidence that the relationship between the length of time suffering from type 2 diabetes mellitus and depression is not always statistically significant in the Indonesian context.

The research is in line with that conducted by Sri Rahayu (2014), The results show that statistically, long-term suffering from type 2 diabetes mellitus does not have a significant relationship with the patient's level of depression, but there is a tendency that patients who have lived longer with this disease tend to show mild to moderate depressive symptoms. These findings confirm that depression in patients with type 2 diabetes mellitus is not only influenced by the duration of the disease, but also by psychosocial factors, the presence of complications, family support, and other health conditions. Thus, this study emphasizes the importance of regular mental health monitoring, psychological interventions, and the provision of social support as part of the comprehensive management of type 2 Diabetes mellitus patients to maintain quality of life and prevent worsening of psychological conditions.

From the results of the research conducted at the Limboto Health Center, it was shown that there was no significant relationship between the length of suffering and the incidence of depression in patients with type 2 diabetes mellitus which was supported by the results of a statistical test using the Spearman Rank test which showed a value of p = 0.412 (> 0.05) with a correlation coefficient of rs = -0.087, so it can be concluded that $H_0$ is accepted and $H_1$ is rejected, which means that there is no significant relationship between the length of suffering and the incidence of depression in patients with type 2 diabetes mellitus at the Limboto Health Center.

Very weak correlation coefficient values and negative values indicate that length of diabetes mellitus is not meaningfully associated with increased or decreased incidence of depression. This indicates that the longer a person suffers from diabetes mellitus, the longer it is not always followed by an increase in the rate of depression. In other words, the length of time a person lives with diabetes mellitus is not the main factor that directly affects the psychological condition of the sufferer, especially in the case of depression.

This condition can occur because each individual has different adaptability and coping mechanisms in dealing with the chronic disease he or she suffers from. Some patients who have suffered from diabetes mellitus for a long time may be familiar with the condition of their disease, so they are able to adjust to lifestyle changes, treatment, and disease management that must be undergone. In addition, social support from family, health workers, and the surrounding environment can also play an important role in helping sufferers manage stress and psychological stress that may arise due to the illness suffered.

Therefore, the incidence of depression in people with diabetes mellitus is not only influenced by the length of time they have been suffering from the disease, but can also be influenced by various other factors such as

general health conditions, level of knowledge about the disease, social support, and the individual's ability to manage stress and emotions.

## CONCLUSION

Long Suffering Type 2 diabetes mellitus patients at Limboto Health Center, <5 years as many as 50 respondents, 5-10 years as many as 25 respondents, and >10 years as many as 16 respondents.

Incidence of Depression in Type 2 Diabetes Mellitus Patients at Limboto Health Center, who experienced depression at least 76 respondents, 10 respondents were mild, and 5 respondents were moderate.

Based on the Spearman Rank test, the value of $p = 0.412$ ($> 0.05$) with a correlation coefficient of $rs = -0.087$, so it can be concluded that $H_0$ is accepted and $H_1$ rejected, which means that there is no significant relationship between the length of suffering and the incidence of depression in patients with type 2 diabetes mellitus at the Limboto Health Center

## ADVICE

The Limboto Health Center is expected to improve health services for patients with type 2 diabetes mellitus by conducting routine monitoring not only of the physical condition, but also of the patient's psychological condition. Regular depression screening needs to be carried out, especially in patients who have been suffering from diabetes mellitus for a long time, so that early detection and treatment of depression can be carried out appropriately.

People with type 2 diabetes mellitus are expected to increase adherence to treatment and disease management, as well as pay more attention to mental health conditions. Patients are encouraged to actively participate in health education, prolaminis activities, and consult with health workers if they experience symptoms of depression so that the quality of life can be maintained.

The researchers were further advised to develop the study by adding other variables related to the incidence of depression in people with diabetes mellitus, such as family support, education level, or disease complications. In addition, the use of research designs and larger sample sizes are expected to provide more comprehensive results.

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