Chapter 16 / Capítulo 16

Health and Professional Practice in Argentina: Applied Research in Patient Care, Workforce Training, and Health Interventions (English Version)
ISBN: 978-9915-704-19-7
DOI: 10.62486/978-9915-704-19-7.ch16
Pages: 163-174

©2025 The authors. This is an open access article distributed under the terms of the Creative Commons Attribution (CC BY) 4.0 License.

Anxiety, depression, and glycemic control in diabetes mellitus / Ansiedad, depresión y control glucémico en diabetes mellitus

Pablo Adrián Feigelmüller[1] ✉, Karina Bustamante Galarza[1] ✉

[1]Facultad de medicina y Ciencias de la salud, Universidad Abierta Interamericana.

ABSTRACT

Type I and II diabetes are disorders caused by excess glucose in the blood, mostly because the body does not secrete enough insulin to meet the demand. One of the consequences of being a chronic disease is that during treatment, mental health disorders such as depression, anxiety, or both coexisting at the same time develop. This is caused by stress, lack of progress in treatment, time, negative emotions, tension, misinformation. In this work, the following variables will be considered: the presence of diabetes with anxiety and/or depression; to analyze the work carried out to obtain results, to assess whether there may be an association between the presence of clinically significant anxiety and worse glycemic control.

Keywords: Anxiety; Diabetes mellitus; Glycemic control; Psychological stress; Adults; Questionnaires.

RESUMEN

La diabetes tipo I y II son un trastorno causado por el exceso de glucosa en la sangre, en su mayoría debido a que el organismo no secreta la suficiente cantidad de insulina para satisfacer la demanda. Una de las consecuencias que se generan por tratarse de una enfermedad crónica, es que durante el tratamiento se desarrollan alteraciones en la salud mental tales como la depresión, ansiedad o ambas coexistiendo a la vez. Esto se genera por estrés, la falta de progreso en el tratamiento, el tiempo, emociones negativas, tensión, la desinformación. En este trabajo se considerarán las siguientes variables: la presencia de diabetes con ansiedad y/o depresión; para analizar en los trabajos realizados para la obtención de resultados, para valorar si puede existir asociación entre la presencia de ansiedad clínicamente significativa y peor control glucémico.

Palabras clave: Ansiedad; Diabetes mellitus; Control glucémico; Estrés psicológico; Adultos; Cuestionarios.

INTRODUCTION

Diabetes is a group of metabolic disorders characterized by increased blood glucose (hyperglycemia) and varying degrees of insulin resistance, increased glucose production, and/or decreased insulin secretion. It is a global health problem associated with millions of deaths each year and is also related to high healthcare costs. The World Health Organization classifies it as a chronic disease, distinguishing between type 1 diabetes mellitus, in which insulin production is deficient, and type 2 diabetes, in which the body lacks sufficient insulin.[(1)]

Various global organizations focus on the proper treatment of diabetes through a healthy diet, physical activity, and medical care.

Type 2 diabetes mellitus is a metabolic disorder characterized by hyperglycemia. It is characterized by a combination of factors, including insulin resistance (the body›s inability to use insulin effectively), reduced insulin secretion by the pancreas, and increased glucose production by the body. Diabetes is a major global health problem. It is a chronic disease because it causes vascular damage from atherosclerosis, ischemic lesions, or cerebral vascular lesions, affecting the microvasculature and damaging target organs, resulting in nephropathy, neuropathy, and diabetic retinopathy. Hyperglycemia causes various metabolic and structural alterations, leading to increased oxidative stress, endothelial dysfunction, and the activation of signals that should not be activated. Ultimately, it reduces life expectancy.[2] Risk factors include obesity, physical inactivity, and family history.[3]

A tool used to control diabetes, in addition to blood glucose, is glycated hemoglobin (HbA1c), an objective marker for diabetes management. Glycosylated hemoglobin is formed when glucose attaches to hemoglobin inside red blood cells. Since red blood cells have a half-life of approximately 3 months, HbA1c reflects glucose control during that time.[4,5,6,7] This characteristic provides a retrospective view of glycemic control, making it an invaluable tool for diagnosing and monitoring diabetes.[8,9,10,11] Maintaining a level below 6,5 % is essential to avoid the risk of developing complications such as cardiovascular and kidney disease, retinopathy, and neuropathy (nerve damage).[12,13,14]

Depression is a psychological disorder that affects patients with chronic diseases and has been highlighted as an obstacle to glycemic control. One of the most characteristic symptoms of depression is the emotional and cognitive stress it causes, called diabetes distress, which originates from the daily management of the disease and complicates the effective control of diabetes treatment.[15]

Anxiety disorders are a group of mental health conditions characterized by excessive and uncontrollable worry and fear, causing alterations in the perception of reality, the environment, and oneself, influencing everything from the ability to think to functioning within society, leading to a loss of functionality and reducing the ability to manage one's comorbidities.[2] The worry is persistent, intense, and challenging to manage. Symptoms can be psychological (irritability, nervousness, difficulty concentrating, constant worry) or physical (palpitations, tremors, difficulty breathing, gastrointestinal problems, insomnia).[12]

The GAD-7 scale is used to detect the presence and severity of Generalized Anxiety Disorder (GAD), although it is also sensitive to other anxiety disorders.[16] It is a brief, widely validated questionnaire consisting of 7 items (each assessing the frequency of anxiety symptoms over the last 2 weeks), with responses scored from 0 to 3. The GAD-7 score is used to classify anxiety levels (0-4 points: minimal or no anxiety; 5-9 points: mild anxiety; 10-14 points: moderate anxiety (clinically significant); 15-21 points: severe anxiety).[12]

The diagnosis of diabetes and adherence to treatment can lead to critical emotional states for the individual, due to the need to modify their lifestyle to adapt to a healthier and unfamiliar one.

People with diabetes may have a significant relationship with disorders such as anxiety. Many

studies show a relationship between anxiety and diabetes, making it more challenging to follow treatment. This highlights the importance of a psychosocial approach to manage the patient's condition better, given the importance of managing emotional disorders within their metabolic disease.[3] Mental health is affected by daily stress, lack of treatment progress, lack of education about nutrition due to misinformation, causing a lack of adherence to treatment due to not having an adequate nutritional treatment plan, and the time and uncertainty regarding their illness lead patients to feel anxious, affecting their mental health.[5]

Research question

In adults with type 2 diabetes undergoing follow-up, can the presence of clinically significant anxiety (defined by a GAD-7 ≥ 10) and/or depression be associated with poorer glycemic control (higher levels of glycosylated hemoglobin, average blood glucose, and/or higher frequency of episodes of hypo/hyperglycemia) compared to those with mild anxiety or no depressive/anxiety disorder?

Justification

Diabetes mellitus represents a global health problem and demonstrates a complex interrelationship with anxiety and depression disorders. It is a set of metabolic disorders characterized by hyperglycemia, associated with millions of deaths annually and high healthcare costs worldwide. The importance of glycemic control, as measured by glycosylated hemoglobin, is affected by emotional states; many studies demonstrate a relationship between emotional states and disorders, making treatment adherence difficult.[5,6,12]

Consequently, the analysis of the articles will focus on exploring and understanding the relationship between them, as diabetes can exacerbate or contribute to these mental health conditions.

It is essential to determine the precise impact of anxiety and depression to develop more effective psychoeducational interventions. By focusing on mental health, these interventions could significantly improve glycated hemoglobin (HbA1c) and therapeutic continuity, thereby reducing diabetes-related complications and, consequently, healthcare costs.[5,6,8,12]

For these reasons, it is necessary to study the subject in depth. This paper will conduct an analysis that quantifies the association between anxiety and depression disorders and metabolic control in this specific population, as well as identify gaps in knowledge, which will help guide future research.

General objectives

To synthesize the available evidence on the association between clinically significant anxiety (defined by a GAD-7 score ≥ 10), depression (diagnostic tests), and glycemic control (HbA1c) in adults aged 18 to 65 years with type 1 or type 2 diabetes mellitus.

Specific objectives

Estimate the mean difference in HbA1c between patients with and without clinical anxiety or depression (according to the GAD-7 ≥ 10, HADS-A ≥ 8, or other validated scales).

Demonstrate how the presence of anxiety/depression favors discontinuity or low adherence to pharmacological treatment.

To analyze whether the type of diabetes (DM 1 vs. DM 2) and gender modify the association between psychological disorders and HbA1c.

METHOD

This study focuses specifically on studies that report on diabetes and present anxiety disorders and/or depression during daily management. Other types of symptoms/disorders mentioned in these studies will not be taken into account.

A narrative review of the literature was conducted, for which an extensive search was conducted across Mendeley, PubMed, LILACS, and Google Scholar. Articles in English, Spanish, and Portuguese were selected.

The study population includes patients with diabetes who monitor their disease daily and are regularly checked by a healthcare professional.

The work will consist of a series of stages: a bibliographic search on the aforementioned site for each work presented, followed by an analysis of the data to interpret the conclusions reached in each citation, for subsequent writing, and, finally, a review.

Finally, after selecting the relevant articles based on the inclusion criteria, a discussion will be held and, ultimately, the conclusions will be presented.

Inclusion criteria

The following criteria will be used:

- Studies that include adults between 18 and 65 years of age diagnosed with type 1 and 2 diabetes mellitus, confirmed by ADA/WHO criteria, and who are followed up on an outpatient and/or inpatient basis.
- Studies that relate diabetes mellitus and depression/anxiety, which will be defined by validated instruments such as GAD-7, the DSM-5 structured interview.
- Studies that include a correlation between clinically significant anxiety and depressive state and HbA1c levels.
- The focus will be on studies that include glycemic control, as measured by at least one objective marker, such as glycosylated hemoglobin.
- Research published in English, Spanish, and Portuguese will be analyzed.
- Articles published within the last 10 years.

Exclusion criteria

- The following are excluded from the study: individuals under 18 years of age, women with gestational or secondary diabetes, and patients over 65 years of age.
- Populations with severe comorbidities that alter HbA1c.
- Non-standardized self-diagnosed anxiety.
- Self-diagnosed depression.
- Populations where other physical and psychological pathologies coexist outside of anxiety and depression.
- Studies based solely on quality of life without reporting glycemic variables with an objective marker.
- Other languages for which no translation is available.
- Previous reviews and meta-analyses.
- Animal or in vitro studies.

- Case series, single cases, letters, comments.

Biases and limitations

- The recruitment or selection process in some studies may introduce selection bias, making the sample less representative of the population of interest.
- Geographic variations in prevalence indicate that cultural, socioeconomic, and health system factors are not always thoroughly analyzed or adjusted for, which may limit the applicability of findings across different regions.
- Heterogeneity of studies: the texts come from studies with different objectives, populations, methodologies (cross-sectional, cohort), sample sizes, and countries. Combining them into a single section of results and discussion may obscure the particularities and validity of each finding.
- Potential for Misinterpretation: an effort was made to maintain the synthesis and consolidation of information from diverse sources, but this carries a small risk of misinterpretation due to disproportionate emphasis on specific findings over others.

RESULTS

In this study, the following articles were analyzed and selected according to the inclusion and exclusion criteria. They examined the relationship between diabetes and anxiety and depression disorders from different perspectives.

Table 1. Bibliographic Summary

Reference	Title	Conclusion
Chaturvedi Santosh K, et al.[6]	More anxious than depressed: prevalence and correlates in a 15-country study of anxiety disorders in people with type 2 diabetes mellitus	A total of 3,170 people internationally (15 countries) with type 2 diabetes were observed, revealing a high prevalence of anxiety disorders (18 %), the most common being generalized anxiety disorder (8,1 %). It was also found that female gender, diabetic complications, longer duration of diabetes, and poor glycemic control are significantly associated with these disorders. Prevalence differs geographically, being higher in Ukraine, Saudi Arabia, and Argentina, and lower in Bangladesh and India. The study concludes that early identification and timely care of psychiatric problems in people with type 2 diabetes is essential.
Francister Medina Aleman, et al.[7]	Association Between Depression and Anxiety and Poor Glycemic Control in Patients with Type 2 Diabetes Mellitus	This study included 188 patients with type 2 diabetes mellitus from the DIABETIMSS program. It was found that 56,9 % of patients had some psychiatric/psychological disorder: 15 % anxiety, 15 % depression, and 26 % a mixed disorder. At the beginning, 86,17 % of participants had poor glycemic control (HbA1c >7 %). Patients with disorders had poorer glycemic control compared to those without. The initial mean serum glucose was 170 mg/dL and the mean HbA1c was 9,08 %. After a period of follow-up, there was an increase in the prevalence of mental health disorders (anxiety rose from 15,4 % to 19,6 %, depression from 15,4 % to 17 %, and mixed disorders from 26,1 % to 27,65 %). Although glucose and HbA1c levels decreased overall (mean glucose to 128 mg/dL, HbA1c). A very significant relationship was found between poor glycemic control and psychological disorders.

Muñoz Monterroza et al.[8]	Anxiety and Depression in Hospitalized Patients with Type 2 Diabetes Mellitus.	A quantitative descriptive approach was used, including 82 hospitalized patients with type 2 diabetes (mostly women, aged 40-59, and with low educational attainment), and found that anxiety disorders (54 %) and depression (65 %) were predominant. Only 16 % reported anxiety and 22 % reported depression. Statistically significant associations were identified between the presence of anxiety and depression and older age, with a stronger association; lower educational attainment was associated with higher levels of anxiety and depression; complications, especially diabetic foot (45 % of patients), were linked to higher levels of anxiety and depression; and longer hospitalization was associated with greater anxiety and depression.
Trief et al.[9]	Psychosocial factors and glycemic control in young adults with type 2 diabetes onset in youth	This cohort study included 348 young adults (average age 26,1 years) with juvenile-onset type 2 diabetes and a mean baseline HbA1c of 9,4 %. It investigated how certain psychological factors influence glycemic control one year later. The results showed that concerns about these medications were associated with a higher probability of having high HbA1c (≥8,0 %) at one year. Specifically, diabetes distress was also linked to higher HbA1c levels. Greater support for self-management and high self-efficacy were associated with a lower likelihood of having high HbA1c. Both belief in the necessity of medications and concerns about them were also associated with a decrease of at least 0,5 % in HbA1c.
Chamseddine ZM et al.[10]	Glycemic indicators and mental health symptoms: results from the Beirut metropolitan area cardiovascular study	This is a cohort study that evaluated the relationship between glycemic indicators (fasting blood glucose - FBG and HbA1c) and symptoms of depression and anxiety in middle-aged adults. I note that 32 % of participants had high levels of depression and 26 % had high levels of anxiety. It also revealed a key finding: only increases in FBG levels above 126 mg/dl (diabetic range) were associated with worsening depression and anxiety. Conversely, FBG levels below 126 mg/dl, and even HbA1c below 6,5 %, were associated with fewer mental health symptoms. This suggests that it is not the gradual increase in glucose that is problematic, but rather entering the pathological range of diabetes. It highlights that patients' mental health could be more affected when they cross the diagnostic threshold for diabetes. This points to the need for early detection and treatment not only of diabetes, but also of mental health conditions. Finally, it suggests that controlled or non-diabetic blood glucose levels may not negatively impact mental health.
Sánchez-Sierra LE et al.[1]	Prevalence and Characterization of Anxiety and Depression Disorders in Patients with Type 2 Diabetes Mellitus	Patients diagnosed with diabetes are more likely to experience mood disorders, such as anxiety and depression, due to the emotional impact of the disease. When a patient is diagnosed with type 2 diabetes, they may go through acute stages of depression and anxiety, but over time they can overcome and learn to control them. They recommend a multidisciplinary approach, especially for newly diagnosed patients.

Pech Puebla D et al.[2]	Anxiety, Depression, Quality of Life, And Tobacco Use in People With Type 2 Diabetes Mellitus	They combined different variables, differentiating between anxiety and depression, associating quality of life with smoking, and collecting information on consumption patterns and tobacco dependence. Smokers who had more symptoms of depression and anxiety were more affected in their quality of life. As a result of the underlying disease (diabetes), the importance of the aforementioned factors in smoking cessation and abstinence interventions should be emphasized.
V Rivas-Acuña et al.[3]	Prevalence of anxiety and depression in people with type 2 diabetes mellitus	A descriptive cross-sectional study was used to identify the levels of anxiety and depression in patients with type 2 diabetes mellitus, using a questionnaire to measure age range, gender, and the relationship between depression and anxiety. The results showed that 43 % of patients with diabetes suffer from these conditions, with the majority of male patients suffering from anxiety, and the level of anxiety and depression in people with diabetes being more frequent in females.

Table 2. Characteristics of the included studies

Author	Year	Design	N	Anxiety/ Depression Scale	HbA1c	Conclusion
Chaturvedi et al.[6]	2019	Multicenter cross-sectional study	3170	GAD-7	Not reported	High prevalence in TAGs associated with poor control
Francister Medina Aleman, et al.[7]	2025	Cohort	188	GAD-7/DSM-5	9,08	Higher HbA1c in patients with anxiety/ depression
Muñoz Monterroza[8]	2020	Descriptive	82	HADS-A/ HADS-D	Not reported	Hospitalization and low educational attainment → ↑ anxiety/depression
Trief et al.[9]	2024	Cohort	348	Diabetes Distress Scale	9,4	Low self-efficacy = high HbA1c
Chamseddine ZM et al.[10]	2024	Cohort	198	PHQ-9/ DSM-4/ GAD-7	5,95 % +/-1,31	Greater increase in glucose, greater negative impact on mental health
V Rivas-Acuña et al.[3]	2018	Cross-sectional descriptive	Not reported	SPSS	Not reported	43 % presented anxiety/depression, with more women than men
Sánchez-Sierra LE et al.[1]	2020	Cross-sectional and descriptive	372	Hamilton Scale	Not reported	More likely to experience anxiety/ depression disorders
Pech Puebla D et al.[2]	2021	Quantitative cross-sectional	44	DSM-4 Depression/ Anxiety Inventory	Not reported	Greater negative impact, increasing anxiety/depression disorders

The various studies analyzed consistently reveal a complex interrelationship between type 2 diabetes mellitus and mental health, particularly depression and anxiety, with significant variations in prevalence and associated factors.

The following table summarizes the evidence from various studies on the relationship between diabetes and anxiety/depression disorders, highlighting the associated factors, prevalence, and measurement tools used.

Factors Associated with Mental Disorders

Glycemic Control

- Cohort studies and the DIABETES study point to a significant association between poor glycemic control (high HbA1c) and a higher probability of mental disorders (anxiety, depression). Patients with disorders had poorer control and, at six months, despite overall improvement, maintained higher glycemic values than patients without disorders.
- One study highlighted that only increases in fasting blood glucose (FBG) above the diabetic threshold (≥126 mg/dl) were associated with worsening depression and anxiety. At the same time, lower levels of FBG or HbA1c were linked to fewer mental health symptoms. This suggests that the problem lies in crossing the threshold for pathology.

Demographic and Clinical Characteristics

The female gender was consistently associated with a higher prevalence of anxiety and depression disorders in most studies.

- The presence of diabetic complications (e.g., diabetic foot) and longer duration of diabetes were significantly associated with anxiety and depression disorders.
- Advanced age, low educational attainment, and more extended hospitalization were also linked to higher levels of anxiety and depression in hospitalized patients.
- Having a stable partner was inversely associated with anxiety and depression, suggesting a protective factor.

Specific Psychological Factors

- Distress about diabetes, beliefs about the need for medication, and concerns about medication were associated with high HbA1c.
- Greater self-management support and higher self-efficacy were associated with a lower probability of high HbA1c.
- Smoking was associated with more symptoms of depression and anxiety and a poorer quality of life in patients with diabetes.

Impact of Mental Disorders on Diabetes Management

- Patients with mental health disorders had a higher risk of not reaching their diabetes control target levels.
- Depression is associated with poorer treatment adherence, influenced by stress, negative emotions, and lack of progress.
- Misinformation and fear of the future also contribute to anxiety and depression.

Potential Interventions

- It is mentioned that functional foods with antioxidant power could significantly reduce anxiety disorders and have positive effects on mental and cognitive regulation.

DISCUSSION

The findings of these studies, coming from diverse contexts and methodologies, converge on the idea that the relationship between type 2 diabetes and mental health is bidirectional and varied. The high prevalence of depression and anxiety in patients with diabetes is a constant in most research, even exceeding pre-pandemic estimates in some regions. This highlights the urgent need for detection and care beyond the purely metabolic management of diabetes.

The association between glycemic control and mental health is remarkably significant. Several studies confirm that poor glycemic control (high HbA1c, FBG in the diabetic range) is strongly linked to worsening psychological symptoms. Critically, it is not the gradual increase in glucose that appears to be most problematic for mental health, but rather the act of crossing the threshold of a diabetes diagnosis or maintaining levels in the pathological range. This has significant implications for prevention and early treatment, suggesting that keeping blood glucose levels within non-diabetic or well-controlled ranges may protect mental health.

Gender differences are also a recurring theme, with women showing greater susceptibility to anxiety and depression in relation to diabetes, which is consistent with patterns observed in the general population and may be influenced by hormonal factors or social roles. In addition, the burden of disease, manifested by diabetic complications and prolonged duration of diabetes, emerges as a considerable stressor that exacerbates mental health problems. The experience of hospitalization, with its inherent stress and uncertainty, also aggravates the situation, especially in prolonged stays.

It is essential to highlight the influence of sociodemographic and psychosocial factors. Low educational attainment is associated with poorer mental health outcomes, possibly due to a lesser understanding of the illness or limited coping resources. On the other hand, having social support, such as a stable partner, offers a protective effect, highlighting the importance of support networks in managing chronic diseases. Expectations regarding medication and self-efficacy also play a crucial role, demonstrating that the patient's perspective on their treatment and their own ability to manage diabetes directly impacts glycemic control and, consequently, their mental health.

Finally, the relationship between mental health and treatment adherence is a key point to highlight. Anxiety and depression can lead to poorer adherence to medical follow-up, which in turn impairs glycemic control and creates a vicious cycle. This highlights the need for a multidisciplinary approach that not only treats diabetes but also actively integrates psychological assessment and support, especially in newly diagnosed patients and those with complications or hospitalizations.

CONCLUSIONS

The combined evidence from the studies analyzed above reinforces that mental health disorders, particularly anxiety and depression, are frequent and clinically relevant comorbidities in people with type 2 diabetes mellitus. Their presence not only implies a significant emotional burden but is also consistently associated with poorer glycemic control and lower therapeutic adherence. Factors such as female gender, the presence of chronic complications, longer disease duration, low educational level, lack of support networks, and prolonged hospitalizations, as well as individual beliefs about the disease and self-care, directly influence this bidirectional relationship between mental health and metabolic control.

One of the most relevant findings indicates that entering the diagnostic range for diabetes can be a turning point for emotional deterioration, which highlights the importance of early diagnosis and maintaining rigorous glycemic control.

Given this scenario, early detection and a comprehensive approach to mental health disorders in people with diabetes are essential. The incorporation of systematic psychological assessments, health education strategies, promotion of self-efficacy, psychosocial support, and an interdisciplinary approach is a key pillar for improving both emotional well-being and metabolic control, as well as the overall quality of life of patients.

Therefore, the clinical management of type 2 diabetes mellitus must consider not only the organic aspects but also the psychological and social determinants that impact the course and prognosis of the disease.

BIBLIOGRAPHIC REFERENCES

1. Sánchez-Sierra LE, Gómez-Medina O, Hernández M, Díaz-Arrazola N, Mejía-Escobar CK, Pastrana MA, et al. Prevalencia y Caracterización de Trastornos de Ansiedad y Depresión en pacientes con Diabetes Mellitus tipo 2, Honduras. Revista Hispanoamericana de Ciencias de la Salud. 2020 Jun 30;6(2):42–52.

2. Pech Puebla D, Lira Mandujano J, Cruz Morales SE, Reynoso Erazo L. ANSIEDAD, DEPRESIÓN, CALIDAD DE VIDA Y CONSUMO DE TABACO EN PERSONAS CON DIABETES MELLITUS TIPO 2. Health and Addictions/Salud y Drogas. 2021 Mar 10;21(1).

3. V Rivas-Acuña, H García-Barjau, A Cruz-León, F Morales-Ramón, Rm Enríquez-Martínez, J Román-Alvarez. Prevalencia de ansiedad y depresión en las personas con diabetes mellitus tipo 2. Mendeley. 2018;17(1-2):30–5. https://www.mendeley.com/catalogue/530697a1-cb83-381d-80f3-6ac7f1a18029/

4. Rodrigo C, Gaibor S, Adrian R, Fabian I, Julissa A. Alimentos funcionales y su efecto en el control de la diabetes. LATAM Revista Latinoamericana de Ciencias Sociales y Humanidades. 2023 Feb 6;4(1).

5. Mayte Bastida-Reyes, Pérez-Jaimes AK, César Uziel Estrada-Reyes. Depression related to adherence to nutritional treatment in patients with type 2 Diabetes Mellitus. Deleted Journal. 2023;6(1):178–83. https://www.mendeley.com/catalogue/06c3c4cd-e849-3a40-8538-1ea3f881cd3f/

6. Chaturvedi, Santosh K, et al. “More Anxious than Depressed: Prevalence and Correlates in a 15-Nation Study of Anxiety Disorders in People with Type 2 Diabetes Mellitus.” General Psychiatry, vol. 32, no. 4, 9 Aug. 2019, p. e100076, www.ncbi.nlm.nih.gov/pmc/articles/PMC6738670/, https://doi.org/10.1136/gpsych-2019-100076.

7. Francister Medina Aleman, et al. “Asociación Entre La Depresión Y La Ansiedad Con El Mal Control Glicémico de Pacientes Con Diabetes Mellitus Tipo 2.” Archivos En Medicina Familiar, vol. 25, no. 5, 31 Oct. 2023, pp. 227–233, www.medigraphic.com/cgi-bin/new/resumen.cgi?IDARTICULO=113226. Accessed 14 July 2025.

8. Muñoz Monterroza, Dennys Isabel, and Aníbal Arteaga Noriega. “Ansiedad Y Depresión En

Pacientes Hospitalizados Con Diabetes Mellitus Tipo 2." Investigación En Enfermería: Imagen Y Desarrollo, vol. 22, 5 Mar. 2021, https://doi.org/10.11144/javeriana.ie22.adph.

9. Trief, Paula M., et al. "Psychosocial Factors and Glycemic Control in Young Adults with Youth-Onset Type 2 Diabetes." JAMA Network Open, vol. 7, no. 4, 8 Apr. 2024, p. e245620, jamanetwork.com/journals/jamanetworkopen/fullarticle/2817292?resultClick=1, https://doi.org/10.1001/jamanetworkopen.2024.5620. Accessed 23 Apr. 2024.

10. Chamseddine ZM, Nasrallah MP, Tamim H, Nasreddine L, Elbejjani M. Glycemic indicators and mental health symptoms: results from the greater Beirut area cardiovascular cohort. Frontiers in Endocrinology. 2024 Oct 16;15.

11. Sidra Qadir MD, Muhammad Hasnain Abbas MD, Awais Aftab MD. Treating Patients With Comorbid Anxiety and Diabetes Mellitus. Psychiatric Times. 2019 Jun 28;36(6). https://www.psychiatrictimes.com/view/treating-patients-comorbid-anxiety-and-diabetes-mellitus

12. Marcelino DB, Carvalho MD de B. Reflexões sobre o diabetes tipo 1 e sua relação com o emocional. Psicologia: Reflexão e Crítica. 2005 Apr;18(1):72–7.

13. O'Brien CL, Ski CF, Thompson DR, Moore G, Mancuso S, Jenkins A, et al. The Mental Health in Diabetes Service (MINDS) to enhance psychosocial health: study protocol for a randomized controlled trial. Trials. 2016 Sep 9;17(1).

14. Fukuda N, Gandhi K, Lim E, Leake A. Validation of the Diabetes Distress Scale in an Asian Pacific Islander Population. Hawai'i Journal of Medicine & Public Health. 2019;78(1):3. https://pmc.ncbi.nlm.nih.gov/articles/PMC6333958/

15. Hong S, Jee Y, Sung YA, Hong YS, Song DK, Jung H, et al. Impact of visit-to-visit glycated hemoglobin variability on diabetes distress and its subscales. Journal of Diabetes and its Complications. 2024 Dec 1;39(1):108924. https://www.sciencedirect.com/science/article/pii/S1056872724002502

16. Almarzooq MA, Almarzoug HA, Alhassan MJ, Mukhtar Ibrahim Alrashed, Alnajjar JS, Noor Abdullah Albejais, et al. Impact of Virtual Clinics on Diabetes Distress and HbA1c Levels Among Patients with Diabetes Mellitus in Saudi Arabia. Medicina. 2025 Jan 28;61(2):234–4. https://www.mdpi.com/1648-9144/61/2/234

FINANCING

None.

CONFLICT OF INTEREST

None.

AUTHORSHIP CONTRIBUTION

Conceptualization: Pablo Adrián Feigelmüller, Karina Bustamante Galarza.
Data curation: Pablo Adrián Feigelmüller, Karina Bustamante Galarza.
Formal analysis: Pablo Adrián Feigelmüller, Karina Bustamante Galarza.
Drafting - original draft: Pablo Adrián Feigelmüller, Karina Bustamante Galarza.
Writing - proofreading and editing: Pablo Adrián Feigelmüller, Karina Bustamante Galarza.