



Review

Mental Health Disorders Associated with Type-2 Diabetes Mellitus and the Importance of its Incorporation into Diabetes Care Protocol: A Narrative Review

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ABSTRACT

Background: Type 2 Diabetes Mellitus (T2DM) is a chronic metabolic disorder that requires lifelong management and is increasingly associated with mental disorders (MD). These psychological conditions adversely affect self-care behaviours, glycaemic control, quality of life, and overall disease outcomes. This review examined the mental health disorders commonly associated with T2DM, their impact on diabetes management, and the importance of integrating mental health support into diabetes care protocols.

Methods: A narrative review methodology was adopted. Literature published between 1990 and 2025 was retrieved from African Journals Online, Google Scholar, PubMed, and ScienceDirect. Additional evidence was obtained from reports of international health organisations and reference lists of relevant studies.

Results: The review identified depression, anxiety disorders, diabetes-related distress, eating disorders, cognitive impairment, sleep disorders, post-traumatic stress disorder, substance use disorders, psychotic disorders, and adjustment disorders as major mental health conditions affecting individuals with T2DM. These disorders were consistently associated with poor medication adherence, unhealthy lifestyle behaviours, inadequate self-management, poor glycaemic control, increased complications, reduced quality of life, and higher healthcare utilisation. Evidence showed that integrating psychological screening, counselling, cognitive behavioural therapy, multidisciplinary care, and psychosocial support into diabetes management improves treatment adherence, emotional well-being, and metabolic outcomes.

Conclusion: Mental health disorders are highly prevalent among individuals with T2DM and significantly influence disease management and outcomes. Comprehensive diabetes care should incorporate routine mental health assessment and intervention. Healthcare systems should implement integrated, multidisciplinary, and patient-centred diabetes care models that include routine psychological screening and mental health support services.

Keywords: Type 2 diabetes mellitus, mental health disorders, depression, anxiety, diabetes distress, glycaemic control, integrated care, psychological support.



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INTRODUCTION

Diabetes mellitus (DM) is a significant global health issue, characterised by sustained hyperglycaemia, or elevated blood glucose. This chronic metabolic condition arises due to inherent issues with insulin, a hormone crucial for the regulation of cellular glucose uptake.¹⁻³ The underlying reasons for DM are either the imperfect secretion of insulin by the pancreas (defects in insulin secretion), the ineffectiveness of the body in utilising the insulin it secretes (defects in insulin action), or most often, their joint impacts. This disturbance in glucose metabolism sets off a cascade of potential complications and makes the early diagnosis and full control even more crucial.¹ Effective T2DM management is a multifaceted task involving a combined effort.⁴ Imperatively, this involves embracing significant lifestyle modifications, such as a nutritional diet, regular physical activity, and proper stress management.^{4,5} Equally crucial is vigilant adherence to medication, which must be used correctly and consistently in accordance with the guidance of a medical practitioner. In addition, regular blood glucose checking is important, providing valuable information to inform treatment alterations and allowing individuals to gain control of their disease, preventing potentially dangerous swings and complications in the long run.⁴ The relentless demands of T2DM control, including constant blood sugar monitoring, pill use, dietary restrictions, and physical activity, place an immense psychological burden on individuals who are afflicted with the disease. It is often an under-estimated burden in the clinical setting and may manifest as diabetes distress, anxiety, depression, and decreased quality of life.⁶ The psychological impact can negatively impact self-care activities, and this creates poorer glycaemic control, risk of complications, and ultimately poorer long-term health outcomes.⁷ This psychological component must be addressed for effective T2DM care and improved patient well-being.

T2DM, a chronic condition requiring continuous monitoring and daily life adjustment, can seriously impair mental health by raising the risk of depression, anxiety, and stress. Conversely, current mental illness may compromise effective T2DM management, leading to poor compliance with medication, diet, and reduced physical activity levels.⁵ Recognition of this two-way interaction is therefore crucial for health professionals to develop integrated care plans that bring together psychosocial care and traditional medical interventions with the objective of improving the physical and mental

well-being outcomes in individuals with T2DM.⁶ The review highlighted the types of MDs affecting T2DM patients, their impacts on disease management, and the need to integrate mental health support into T2DM management.

METHODOLOGY

Study Design: This study employed a narrative review to examine the relationship between mental health disorders and Type 2 Diabetes Mellitus (T2DM), and to highlight the importance of incorporating mental health assessment and management into diabetes care protocols. A narrative review approach was selected because it enables the synthesis of evidence from diverse study designs, including quantitative studies, qualitative studies, systematic reviews, meta-analyses, clinical guidelines, and policy documents.⁵

Search Strategy: A comprehensive literature search was conducted across multiple electronic databases, including African Journals Online, Google Scholar, PubMed, and Science Direct. Additional sources were identified through manual searches of the reference lists of relevant articles and reports from recognised organisations such as the World Health Organisation, the International Diabetes Federation, and the American Diabetes Association. The search was limited to articles published between 1990 and 2025 to ensure that both old and current evidence and clinical recommendations were captured. The search employed combinations of Medical Subject Headings (MeSH) terms and keywords using Boolean operators (AND, OR), such as "diabetes mellitus", "Type-2 diabetes mellitus", "mental disorders", "impact of mental disorders on T2DM patients", "diabetes care protocol", "diabetes distress", "psychological disorders" and "the importance of integrating mental health support into diabetes management" among others.

Eligibility Criteria

Inclusion Criteria: Studies were included in the review if they focused on adults diagnosed with Type 2 Diabetes Mellitus, examined mental health disorders associated with T2DM, investigated the impact of mental health conditions on diabetes outcomes, evaluated mental health interventions or integrated care approaches for diabetes management, were published in peer-reviewed journals and were written in English.

Exclusion Criteria: Studies were excluded if they focused exclusively on Type 1 Diabetes Mellitus or gestational diabetes, did not address mental health

outcomes in relation to T2DM, were duplicate publications, or were published in languages other than English.

Study Selection Process: The study selection process involved several stages. First, titles and abstracts retrieved from the database searches were screened for relevance to the review objectives. Articles that appeared relevant were subjected to full-text review. Full-text articles were then assessed against the predefined inclusion and exclusion criteria. Studies meeting the eligibility criteria were included in the final review. To enhance comprehensiveness, reference lists of selected articles were manually searched to identify additional relevant publications that may not have been captured through database searches.

Data Extraction and Synthesis: Relevant data were extracted from each included study using a standardised data extraction template. Information collected included author(s) and year of publication, study design, and key findings. The findings were synthesized narratively by grouping studies according to emerging themes and patterns related to the review objectives.

Presentation of Findings

Overview of Mental Disorders Associated with T2DM Patients: Some of the most common MDs that are often associated with T2DM care include:

Depression: Depression is one of the most common psychiatric diseases found in individuals with T2DM, with the incidence rates much greater than in the general population. Experiences are universally reported to show that T2DM patients have a significantly greater incidence of depression than the general population. The incidence of depressive disorders among diabetes patients falls within the general category of 10% to 15%, about two times higher than in nondiabetics.^{6,8-11} Ali et al.⁶, established that the occurrence of depression was significantly greater in patients with T2DM compared to non-diabetic patients and in females with diabetes compared to men with diabetes. Similarly, a similar investigation in the United Kingdom also revealed evidence of the co-relationship between scores for depression and T2DM, whether or not this had, or had not, previously been diagnosed.¹² In the same study, there was also a correlation between depression scores and levels of blood glucose and insulin in men without any past diagnosis of diabetes.¹² A study conducted in Botswana found the prevalence of depression among diabetic patients to be 34.0%. From the survey, depression was associated with female gender and

hospitalisation three or more times.¹³ Additionally, the main symptoms of depression that diabetes patients normally present are depressive mood, loss of interest in activities, fatigue, and hopelessness.¹³ This increased susceptibility to depression among patients with diabetes is from a comprehensive interaction of several factors, such as the chronicity of the T2DM treatment, the potential of T2DM complications, and the biological impact of the disease on brain function.¹³ The demands of monitoring blood glucose, administering insulin, and adhering to rigorous diet and exercise regimens constantly can create a persistent feeling of loss of control and burden.⁴ Depression significantly affects T2DM management, and a bidirectional relationship between the two conditions has been demonstrated. Individuals with T2DM are more likely to be depressed, and individuals with depression are more likely to develop type 2 diabetes.¹⁴ Depression exacerbates cognitive and emotional functioning, often expressing itself in negative self-care practices such as poor nutrition, sedentary lifestyle, neglect of medications, and neglect of glucose monitoring.¹⁵ These behaviours directly undermine glycaemic control and increase the risk of diabetes complications.^{2,5} Depression has also been associated with non-adherence to treatment regimens and lack of motivation to attend follow-up appointments with health care providers.¹⁶ This reduced engagement results in higher hospitalisation and mortality rates due to diabetes.¹⁷ Depression can also biologically increase insulin resistance and markers of inflammation, contributing to the physiological challenge of diabetes control.¹⁸

Anxiety Disorders

Anxiety disorders are a group of mental illnesses characterised by an overabundance of worry, fear, or nervousness that has the potential to drastically impact daily functioning.¹ The disorder, including generalised anxiety disorder (GAD), panic disorder, and social anxiety disorder, among others, is increasingly recognised as a comorbidity of patients with T2DM.¹ The stress of managing a long-term illness, worry over developing complications (e.g., hypoglycaemia or long-term vascular damage), and the inconvenience of daily care procedures may all contribute to heightened levels of anxiety.¹ Anxiety and diabetes are intimately connected in a complex and vicious cycle, with one frequently exacerbating the other in a discouraging cycle.^{19,20} The stress hormones released during anxiety can immediately affect blood sugar levels, making

diabetes control immensely challenging. Erratic blood sugar, in turn, can produce physical symptoms such as shakiness, dizziness, and a racing heartbeat, simulating or even precipitating anxiety symptoms and panic attacks. This creates the feedback loop of diabetes control worsened by anxiety and the challenges of diabetes contributing to increased anxiety levels, and so on, leaving people stuck and overwhelmed.²¹ Hypoglycaemic attacks, for instance, may trigger panic attacks or heightened anxiety, further adding to disease complexity. Both conditions must be addressed simultaneously for this cycle to be disrupted and overall well-being to be increased.²¹

Systematic reviews reported a higher incidence and prevalence of anxiety disorders in type 2 diabetes mellitus patients compared to the general population.^{13,22-26} The most frequent anxiety disorders in persons with T2DM are GAD (21%), social phobia (7%), and panic disorder (2.5%).²⁷ An extremely high proportion of persons with diabetes also exhibit elevated subsyndromal anxiety and elevated levels of anxiety symptoms.^{22,28,29} A hospital survey in Zaria, Nigeria, found that 42.2% had anxiety disorders, 46.7% had generalised anxiety disorder, 51.9% had panic disorder, 30.1% had agoraphobia, and 31.4% had co-occurring depression and anxiety disorder.³⁰ Similarly, a study conducted in Sagamu, South-West Nigeria had a significant finding for females on the GHQ-12 and HADS questionnaire to be (29.6 vs. 9.1 $p < 0.05$), HADS for anxiety (18.5 vs. 4.5 $p < .05$).³¹ Similarly, another study in Ibadan reported the rate of anxiety and comorbidity of depression and anxiety to be 16.5% and 4.4%, respectively.³²

Diabetes-Related Stress

Diabetes distress, or diabetes distress syndrome, is a condition where individuals with T2DM experience excessive psychological and emotional burdens caused by their illness.³³ Symptoms are persistent worry about T2DM control, guilt or failure about blood sugar management, avoidance of activities associated with diabetes care (e.g., missing blood glucose or insulin), emotional burnout or exhaustion, irritability, frustration or anger at T2DM, or withdrawal or social isolation.³³ In contrast to clinical depression or anxiety, diabetes distress is specifically associated with the burdens of living with diabetes.³³ Diabetes can lead to a lot of stress in one's life, which is usually referred to as diabetes-related stress or diabetes distress. The stress arises from the constant demands of managing the condition,

including checking blood glucose levels, adhering to a diet, taking medication, and exercising care to prevent complications.³⁴ The constant need to do these tasks may result in feelings of anxiety, frustration, guilt, and burnout. The long-term diabetes health consequences, what it might do to lifestyle, and the treatment cost are issues that can make people stressed. In addition to its behavioural ramifications, diabetes-related stress has been hypothesised to provoke physiological stress responses, such as increased cortisol secretion, to exacerbate insulin resistance and glucose dysregulation.³⁵ Also, health avoidance and reduced communication with the providers are more common among individuals with high diabetes distress, leading to suboptimal clinical outcomes.³⁶ Successful diabetes distress management is critical in improving both physical and mental health in people with diabetes. Evidence indicates that diabetes distress impacts Type 1 and Type 2 diabetes patients.²⁶ Literature suggests that 30-40% of all people with diabetes will suffer from high levels of diabetes distress at some point in their lifetime.³⁷ A study in Egypt, which set the prevalence of diabetes mellitus distress in type-2 DM patients with COVID-19 was 13.4%.³⁸ Another study among adults with DM set the prevalence of diabetes-related distress at 35.4%. The study also found that people who had poor glycaemic control had higher odds of distress.³⁹ Besides, it was documented in a South Indian study that the majority of T2DM patients (70%) experience psychological distress. Higher self-reported distress was the strongest independent predictor of medication non-adherence ($\beta = -0.1145$; $P=0.0002$).⁴⁰ In addition, it was documented by a South-East Nigerian study that 51.9% of the study population had moderate to severe diabetes distress.⁴¹ Causes of diabetes stress include: disease management burden, fear of complications, social and emotional burdens, hypoglycaemia anxiety, and financial burden.⁴²

Eating Disorders

Eating disorders (EDs) are a severe and often unrecognised comorbidity of the T2DM patient group, with much higher prevalence rates than the general population prevalence rates.⁴² A solitary and extreme form, also known as "diabulimia" or insulin omission, involves insulin omission or subcutaneous insulin neutralisation to maintain weight, leading to acute and chronic complications such as diabetes ketoacidosis, retinopathy, and nephropathy.⁴³ Epidemiologically, T2DM patients present with a high ED risk, and binge eating disorder is particularly high, at 10-20% and even

more so related to weight stigma, dieting, and weight-related psychological distress.⁴⁴ Untreated or undiagnosed EDs in T2DM have been linked to poor glycaemic control, more frequent severe T2DM complications, and decreased quality of life, which emphasises the routine screening and concurrent psychological support in the overall care of T2DM.⁴² The prevalence of eating disorders among patients with T2DM is heterogeneous across different populations and studies. According to a systematic review, it has been reported that the prevalence of disordered eating patterns in this group is 10% to 40%, varying depending on the diagnostic parameters used and on the population under investigation.⁴⁵ In Nigeria, not many studies exist, yet they have high rates of eating disorders among T2DM patients, as per existing research. Disordered eating behaviour was found in approximately 15% of Nigerian diabetes patients.⁴⁶ This may complicate glycaemic control and disease outcomes. Routine screening and appropriately designed interventions are therefore indicated in the Nigerian context.

Cognitive Impairment

Type 2 Diabetes Mellitus elevates the risk and hastens the progression of cognitive impairment (CI), one of the greatest comorbidities with extensive implications for both patient quality of life and disease management.^{47,48} Epidemiological studies universally reveal a higher prevalence of both mild cognitive impairment (MCI) and dementia, such as Alzheimer's disease (AD) and vascular dementia (VaD), in individuals with T2DM compared to the general population.⁴⁹ These tend to include Memory loss, difficulty concentrating, and poor judgment. Evidence shows that people with T2DM are at least 1.5 to 2 times more likely to develop cognitive impairments during their lifetime, with some studies showing an increase of three times in risk for some impairment, like executive dysfunction and memory impairment.⁴⁷ Aesthetic variables of major importance influencing this risk include diabetes duration, longstanding hyperglycaemia, recurrent hypoglycaemia, and the presence of diabetes-related microvascular complications like retinopathy and nephropathy.⁵⁰ Further, shared vascular risk factors like hypertension, dyslipidaemia, and overweight, often present in conjunction with diabetes, contribute synergistically to cognitive impairment, which again reflects the multifactorial nature of this global issue.⁵¹ The occurrence of cognitive impairment among diabetes patients is increasingly becoming an issue worldwide.

Globally, there is evidence that individuals with diabetes, especially type 2 diabetes, are at increased risk of developing cognitive decline and impairment.⁵² A meta-analysis indicated that about 20-30% of older individuals with diabetes experience some kind of cognitive impairment, which, if not well managed, can progress to dementia.⁵³ There is increasing research on this topic in Nigeria. Abdullahi et al.⁵⁴, in one study, found that approximately 53.6% of Nigerian adults with T2DM had signs of cognitive impairment, highlighting the public health impact of diabetes complications in Nigeria. Another study from South-East Nigeria found that 44% of patients with T2DM met the criteria for cognitive impairment on the Mini-Mental State Examination (MMSE) (≤ 24).⁵⁵ This calls for the necessity of cognitive assessment and early intervention in diabetes care in Nigerian clinical practice. Older adults with diabetes and cognitive disability are likely to have impaired ability to detect symptoms of hypoglycaemia, threatening severe hypoglycaemic events.⁵⁶ Furthermore, impaired judgment and memory can result in missed insulin doses, over- or under-treatment with insulin, and poor diet control, all of which result in poor glycaemic control and hospitalisation.⁵⁷ Cognitive impairment also results in greater caregiver dependency, placing additional burdens on families and the health care system. It may limit the patient to the enjoyment of benefits under usual diabetes educational programs, stressing the need for minimising treatment plan complexity, caregiver involvement, and regular cognitive testing.⁵⁸

Sleep Disorders

The epidemiologic background reports a drastically heightened rate of sleep disorders in individuals with diabetes, establishing a root comorbidity that affects disease control and the general level of living.⁵⁹ The symptoms include insomnia, excessive daytime somnolence, and irritability.⁶⁰ Obstructive Sleep Apnoea (OSA) is rare, with epidemiological studies reporting prevalence rates of 60% to 80% in type 2 diabetes populations, compared to the population at large.⁶¹ Moreover, a meta-analysis estimated the overall prevalence of sleep disorders in diabetes as 52%, and that of OSA was the highest (60-69%).⁶¹ Insomnia, or difficulty with initiating or sustaining sleep, is also extremely common and affects an estimated 35-50% of diabetes patients,⁶² and is often comorbid with anxiety, nocturia, and neuropathic pain. Another common issue is Restless Legs Syndrome (RLS), particularly in patients with diabetes neuropathy.⁶³ Alongside this, diabetes

complications such as neuropathy, obesity, and cardiovascular disease threaten individuals with sleep disorders, and defective sleep quality in turn exacerbates insulin resistance, systemic inflammation, and glycaemic dysregulation, creating a cycle of viciousness.⁶⁴ Proper identification and treatment of sleep disorders are therefore of the highest value in the management of diabetes in an integrative context because their uncontrolled occurrence results in poorer metabolic control and increased cardiovascular risk. In addition, research has shown that disturbed sleep among people with diabetes is higher than in people without diabetes, where others have reported a 33.7% prevalence in diabetic patients as opposed to 8.2% in controls.⁶⁵ Additionally, a study in Nigeria found that 27% of respondents were high-risk subjects for OSA and 22% for excessive daytime sleepiness.⁶⁶

Post-Traumatic Stress Disorder (PTSD)

PTSD and diabetes mellitus comorbidity is increasingly a significant public health concern, recognising overlapping psychological and physiological vulnerabilities.⁶⁷ Flashback, hyperarousal, and anhedonia are but a few examples of symptoms.⁶⁷ Epidemiological studies indicate that the incidence of PTSD in diabetes patients is much higher in comparison to the population at large.^{67,68} Prevalence rates vary, with some reporting rates in the range of approximately 12% to over 20% in mixed patient populations.^{67,68} That is significantly higher than lifetime prevalence rates of PTSD in the general adult population, typically around 6-8%.⁶⁹ Moreover, the type of diabetes may impact such rates, in that specific patterns have been found in patients with Type 1 as opposed to Type 2 diabetes, although findings may be heterogeneous.⁶⁹ The co-occurrence is critical considering its two-way interrelationship: diabetes control, chronic stress as a trauma, and PTSD undermining self-management behaviours, leading to poor glycaemic control, increased complications, and reduced quality of life.⁷⁰ The overlap in epidemiology acknowledges this and necessitates routine screening for PTSD in diabetes healthcare settings to allow for early identification and combined mental healthcare, improving end-of-patient outcomes.

Substance Use Disorders

Comorbidity between substance use disorder (SUD) and diabetes mellitus is a significant public health issue, interfering with disease management and exacerbating patient outcomes.⁷¹ Over and over again, epidemiological studies establish that SUD occurs more

frequently in diabetes populations than in the general population, with rates varying but typically two to ten times greater, depending on the substance, population, and diagnostic criteria employed.⁷² Symptoms include increased tolerance, withdrawal symptoms, and neglect of responsibility.⁷¹ Such high prevalence is all the more important because SUD can seriously interfere with self-management activities important to glycaemic control, like taking medication, diet conformity, exercise regularly, and checking blood glucose.⁷³ While alcohol use disorder is prevalent, leading to higher rates of hypoglycaemia and diabetic ketoacidosis, other drugs such as opioids, cannabis, and stimulants are also abused and contribute significantly to the burden by causing poorer glycaemic control, more complications, and higher healthcare use.⁷⁴ The multifaceted, often bidirectional, relationship between SUD and diabetes underscores the importance of routine screening, collaborative care models, and simultaneous individualised interventions that treat both disorders to improve health outcomes in this at-risk patient group.⁷⁵

Psychotic Disorders

The comorbidity between psychotic disorders and diabetes mellitus is one of the most important public health issues, and epidemiological surveys have consistently found the prevalence of psychotic spectrum disorders, e.g., schizophrenia and bipolar disorder with psychotic symptoms, to be higher among diabetic patients compared to the general population.^{76,77} The symptoms are hallucinations, delusions, and confused thinking. This augmented co-occurrence is typically bidirectional, where metabolic dysregulation results in susceptibility to mental illness and certain psychotropic drugs, particularly second-generation antipsychotics, resulting in metabolic syndrome and, finally, diabetes.⁷⁹ There is a two- to three-fold estimated risk of developing a psychotic disorder for diabetic patients, with reference to shared pathophysiological processes like chronic inflammation, oxidative stress, and neuroendocrine disturbance.⁷⁹ The presence of psychotic symptoms has a profound impact on diabetes self-care and leads to poorer glycaemic control, greater complications, and increased mortality in this vulnerable subgroup.⁸⁰ Thus, it is crucial to understand this complex association for the construction of practical models of combined care that work to address both physical and mental health.⁸⁰ Nigerian research showed that only 31.0% of the T2DM patients presented psychiatric symptoms of generalised anxiety (6%) and mild depressive disorder (4%).⁸¹

Adjustment Disorders

Adjustment disorders (ADs) are a relatively under-recognised but significant mental health comorbidity in diabetes, mirroring the long-term psychological stress of living with a chronic illness.⁸² Epidemiological findings show a high rate of ADs in people with diabetes, up to 15%, even as high as 30-40% in some populations, significantly higher than that experienced in the general population.⁸³ This heightened vulnerability is attributed to the day-to-day self-care demands, the ongoing threat of micro- and macrovascular complications, and also the

emotional strain of glycaemic oscillations and the chronic nature of the condition.⁸⁴ Facilitating factors for heightened risk are recent diagnosis, development of diabetes complications, poor glycaemic control, and prior-existing psychosocial vulnerabilities.⁸² Co-existence of ADs has been found to have negative impacts on metabolic control, quality of life, and self-management adherence, and therefore highlights the need for regular screening and inclusion of mental health care in diabetes care.⁸³

Summary of the studies on Mental Disorders among T2DM patients

Types of MD	Authors	Location	Study Design
Depression	Ali et al. ⁶ , Anderson et al. ¹⁰ , Holt et al. ¹² , Moshomo et al. ¹³ ,	Global ^{6,10} , United Kingdom ¹² , Botswana ¹³	Systematic Review ⁶ , Meta-analysis ¹⁰ , Cross-sectional ^{12,13}
Anxiety Disorders	Deschênes et al. ¹⁹ , Chien & Lin ²⁰ , Kalra et al. ²¹ , Smith et al. ²² , Carroll et al. ²⁴ , Mohammed et al. ³⁰ , Odunsan et al. ³¹ , Ilori et al. ³²	Canada ¹⁹ , Taiwan ²⁰ , Global ^{21,22} , Vietnam ²⁴ , Nigeria ³⁰⁻³²	Cross-sectional ^{19,20,24,30,31,32} , Review ²¹ , Systematic Review ²²
Diabetes Related Stress	Sayed Ahmed et al. ³⁸ , Alwani et al. ³⁹ , Akshatha & Nayak Uday ⁴⁰ , Onyenekwe et al. ⁴¹	Egypt ³⁸ , India ^{39,40} , Nigeria ⁴¹	Cross-sectional ^{38,39,40,41} ,
Eating Disorders	Young et al. ⁴³ , Pinhas-Hamiel & Levy-Shraga et al. ⁴⁴ , Akinrinoye et al. ⁴⁶	Global ⁴³ , Isreal ⁴⁴ , Nigeria ⁴⁶	Systematic Review ⁴³ , Cross-sectional ^{44,46}
Cognitive Impairment	Abba et al. ⁴⁸ , Bornstein et al. ⁴⁹ , Das et al. ⁵⁰ , Mavrodaris et al. ⁵¹ , Zilliox et al. ⁵² , Abdullahi et al. ⁵⁴ , Eze et al. ⁵⁵ , Munshi et al. ⁵⁷	Cameron ⁴⁸ , Global ^{49,52} , India ⁵⁰ , Sub-Saharan Africa ⁵¹ , Nigeria ^{54,55} , USA ⁵⁷	Cross-sectional ^{48,54,55,57} , Review ⁴⁹ , Epidemiological study ⁵⁰ , Systematic review ⁵¹ , Review ⁵²
Sleep Disorders	Ogilvie et al. ⁵⁹ , Wondie ⁶⁰ , Khalil et al. ⁶¹ , Chen et al. ⁶² , Cho ⁶⁴ , Sridhar et al. ⁶⁵ , Obaseki et al. ⁶⁶	Global ^{59,61,62,64} , Ethiopia ⁶⁰ , India ⁶⁵ , Nigeria ⁶⁶	Review ^{59,64} , Cross-sectional ^{60,65,66} , Systematic review ^{61,62}
PSTD	Roberts et al. ⁶⁷ , Aronson ⁶⁸ , Spottswood ⁶⁹ ,	USA ^{67,68} , Global ⁶⁹	Longitudinal ⁶⁷ , Community-based participatory ⁶⁸ , Systematic review ⁶⁹
Substance use disorder	Wu et al. ⁷¹ , Alhassan ⁷² , Horigian et al. ⁷³ , Walter et al. ⁷⁴	USA ^{71,73} , UAE ⁷² , Global ⁷⁴	Risk prevalence study ⁷¹ , Review ^{72,74} , Retrospective analysis ⁷³ ,
Psychotic disorders	Charles et al. ⁷⁷ , Rabie ⁷⁸ , Akhaury et al. ⁷⁹ , Kalra et al. ⁸⁰ , Coker ⁸¹	Global ^{77,78,79,80} , Nigeria ⁸¹	Systematic Literature review ⁷⁷ , Review ^{78,79,80} , Comparison study ⁸¹

Integration of Mental Health Support into T2DM Management Protocols

The incorporation of mental health care into T2DM management is increasingly being realised as central to improving both psychological and physical well-being.⁸⁵ People with T2DM are significantly more at risk for developing comorbid mental health conditions such as depression, anxiety, diabetes distress, and eating disorders.⁸⁶ These co-morbidities negatively affect self-management practices, glycaemic control, and quality of life.¹⁵ The mental health treatment of T2DM requires inclusion of routine psychological screening, availability of mental health professionals, and team-based models of care that address affective as well as metabolic needs. Integration of behavioural health services such as cognitive-behavioural therapy (CBT), motivational interviewing, and stress management has been shown to enhance medication adherence, improve self-management abilities, and reduce the risk of complications from diabetes.⁸⁷ Clinical practice guidelines now recommend systematic screening for depression and diabetes distress with standardised instruments like the PHQ-9 and the Diabetes Distress Scale.²⁶

Multidisciplinary team management by primary care physicians, endocrinologists, diabetes educators, psychologists, and social workers is essential in providing comprehensive and patient-centered care.^{5,88} Education of providers, stigma reduction, and improved referral processes between medical and mental health care should also be included in effective integration. Digital health technologies and telemedicine platforms can also enhance access to mental health care, especially in at-risk groups.⁸⁹

Importance of Integrating Mental Support into Diabetes Management Protocols

1. **Bidirectional Relationship:** The diabetes-mental illness relationship is extremely bidirectional in that each significantly contributes to and exacerbates the other.^{10,90} In the first place, having diabetes automatically exposes one to developing mental disorders such as depression and anxiety.⁸⁶ This heightened vulnerability is brought about by the constant weight of suffering from a chronic ailment: the constant checking of blood sugar, stringent dietary limitations, the need for constant exercise, and strict medication adherence can become exhausting and suffocating.²⁶

The possibility of serious long-term damage like blindness, nerve impairment, kidney failure,

cardiovascular disease, or amputation adds an extra layer of constant anxiety and tension, casting a shadow over life.⁹¹ This long-term conflict can create a specific form of emotional distress known as "diabetes distress," where one feels frustrated, defeated, and overwhelmed by diabetes, which, if left untreated, will escalate to clinical depression or anxiety disorder.^{15,26} The biochemical changes in diabetes, such as inflammation and glucose variability, can even directly affect brain chemistry, which is responsible for mood variations.⁹² On the other hand, people who are already struggling with mental illness have significant difficulty keeping up with their diabetes.⁸⁷ Depression symptoms, including loss of energy, lack of motivation, disinterest, forgetfulness, and concentration problems, can directly hinder following complicated diabetes regimens.⁹³ It is more difficult to regularly check blood sugar, prepare nutritious meals, exercise, and remember medication. Anxiety may at times manifest as panic attacks that disrupt normality or lead to avoidance of visits to the doctor by provoking fear or debilitating stress.¹ Furthermore, some psychiatric drugs may impact metabolism or lead to weight gain, making glycaemic control a problem.⁹⁴ When mental well-being is lost, self-discipline and strictness necessary for optimal diabetes control give way, and blood glucose control is poor, acute episodes (e.g., hypoglycaemia or hyperglycaemia) are increased, and the rate of development of long-term complications is more rapid.¹⁷ This creates a cycle of violence in which poor physical health exacerbates mental illness, and vice versa, underlining the need for an urgent, joined-up, holistic solution that addresses both disease states simultaneously.

2. **Enhanced Adherence to Treatment:** A key initiative towards the optimisation of patient results is the building of much enhanced treatment adherence. This frequently depends on successfully responding to the intricate network of psychological obstacles that too often subvert patients' best efforts.⁴² Illnesses such as diabetes create a condition of chronic anxiety, fear, and frustration concerning disease control, typically resulting in the experience of being overwhelmed, hopeless, or angry, and burnout, the emotional and physical exhaustion caused by the chronic daily demands of self-care, are extremely detrimental.²⁶ Such pervasive psychological problems directly erode a patient's internal motivation and sense of self-efficacy.⁹⁵ When patients feel depleted, defeated, or emotionally burdened, the wish and

capacity to go on forever with the arduous regimen of diabetes care necessarily lag.¹⁵

By taking action early and proactively to meet these emotional burdens, employing strategies such as counselling, cognitive behavioural therapy, support groups, stress-reduction skills, or empathic and compassionate clinical communication, healthcare providers can remove the overwhelming burden of long-term disease care.⁹⁶ Not only does this rekindle hope and strengthen patients, producing a renewed sense of control and meaning, but it also crucially enhances their own intrinsic motivation to participate actively in their care.⁹⁷

Consequently, this enhanced psychological health is conveyed directly into highly tangible improvements in adherence in all phases of treatment that are essential.⁸⁷ Patients become more compliant with medication therapies (e.g., taking insulin at the appropriate times, remembering tablets), more diligent at preparing and sustaining the dietary modifications (e.g., portion control, counting carbohydrate, healthy eating), and more committed to adhering to and sustaining important way-of-life changes like regular exercise, adequate sleep, and effective stress management strategies.⁹⁸ Lastly, this integrated strategy not only maximises day-to-day control but also substantially contributes to better long-term health and increased quality of life.

3. **Enhanced Glycaemic Control:** The association between improved blood sugar control and mental health care can be attributed to numerous reasons.¹⁵ By integrating therapy and counselling within the management of T2DM patients, clinicians can facilitate patients to develop enhanced self-care behaviours.²⁶ Enhanced self-care behaviours include adherence to medication schedules, consuming a balanced diet, and engaging in regular physical exercise.³⁶ In addition, mental health care allows for stress management, which is significant among people with diabetes.⁹⁹ Stress raises blood glucose levels by triggering the release of stress hormones, such as cortisol and adrenaline.¹⁰⁰ These hormones tell the liver to release additional glucose, which will exacerbate existing imbalances in blood sugar.

Moreover, patients can be taught how to manage stress better through coping methods aided by counselling and therapy.⁹⁶ These can include relaxation techniques, mindfulness exercises, or cognitive-behavioural therapy

to assist in countering adverse thought patterns.¹⁰¹ In doing so, by addressing the mental health of individuals with diabetes, healthcare providers can help them better manage their condition and achieve better glycaemic control. In addition to maximising blood glucose levels, mental health treatment can also ensure overall quality of life for individuals with diabetes.⁸⁹ By addressing the psychological and emotional impacts of managing a chronic illness, counselling and therapy can empower patients and enable them to manage their health.⁸⁷ This, in turn, can lead to improved treatment compliance and better long-term outcomes.

4. **Holistic Patient Care:** Holistic patient care is a revolutionary paradigm shift that transcends the traditional disease-focused model, essentially paying tribute to the intricate web of a human's existence rather than treating isolated symptoms or a specific diagnosis.¹⁰² This holistic model ensures that patients are treated as complete, multi-dimensional individuals, understanding that their physical ailments inextricably weave together with their mental, emotional, social, and even spiritual aspects of well-being.¹⁰³

Furthermore, for those who struggle with the day-to-day challenges of a chronic condition, the experience extends far beyond medication regimens and doctors' appointments. There is a profound and often invisible emotional toll: the everyday tension of symptom management, the fear of decline, the anger of restriction, the grief for lost function or former selves, and the constant concern for the future.¹⁰⁴ A holistically complete model provides speciality support for these mental impacts, with access to mental healthcare providers such as therapists or counsellors, the opportunity to participate in support groups where patients can share experiences and coping strategies, and access to stress reduction and mindfulness resources that work to enhance resilience and support emotional stability.¹⁰⁵ Ultimately, the aim is to promote overall wellness, not just physical health, with good medical care, personalised nutritional counselling, pain management, and personalised exercise instruction, but also psychological equilibrium, social engagement, and spiritual peace.¹⁰⁶ By addressing every area of a patient's life, this comprehensive method aims to enhance their quality of life, allow them to be active participants in their care, enhance adherence to treatment routines, and give them the skills necessary to thrive despite their condition, not merely endure it.¹⁰⁷ It establishes a healing

relationship between the patient and a team of multidisciplinary health professionals to ensure every dimension of their health is addressed and taken care of.¹⁰⁸

5. **Healthcare Burden Reduced:** One of the primary benefits of putting mental health first is the significant reduction in the overall burden on healthcare systems.¹⁰⁹ By recognising warning signs of risk and intervening early to treat the initial stages of mental illness, doctors can prevent disorders from developing into more debilitating, chronic, and complex conditions.¹¹⁰ This proactive approach significantly decreases the need for high-acuity treatment, which leads to fewer costly emergency department visits, fewer long-term inpatient psychiatric admissions, and fewer readmissions.¹¹¹ When appropriate and timely care is offered, prevention of developing co-occurring illnesses such as substance abuse or deterioration of physical health problems, often compounded with neglected mental health care, can also be prevented.¹¹² In the end, this has a direct correlation to important fiscal savings in the long term, not just in direct medical expenses (meds, therapy sessions, specialist appointments), but also by avoiding the massive indirect costs of untreated mental illness, like lost productivity due to disability or absenteeism, for a more sustainable and economically sound healthcare system.¹¹³

Implications of the findings for diabetes management and future research and practice

The findings of this narrative review carry profound implications for diabetes management, future research, and clinical practice, fundamentally arguing that Type 2 Diabetes Mellitus (T2DM) cannot be effectively managed through a purely biomedical lens but rather demands an integrated biopsychosocial model. For diabetes management, there is an urgent need to restructure care protocols to mandate routine mental health screening using validated tools such as the PHQ-9 for depression, GAD-7 for anxiety, and the Diabetes Distress Scale at diagnosis and regular intervals. This shift from reactive to proactive care would enable early identification of psychological burden and diabetes burnout before they evolve into full blown disorders. Furthermore, adoption of multidisciplinary collaborative care models including psychologists, counsellors, and social workers within diabetes teams is essential, particularly in low-resource settings like Nigeria.

Enhanced self-management support, incorporating psychologically informed education such as cognitive-behavioural therapy principles and motivational interviewing, can directly improve medication adherence, glycaemic control, and reduce complications. From a research perspective, significant gaps exist in epidemiological data from low- and middle-income countries, necessitating large-scale studies on the prevalence of eating disorders, PTSD, and adjustment disorders among T2DM patients in sub-Saharan Africa. Future research must prioritise implementation science to evaluate how best to integrate mental health screening into routine care, comparative effectiveness trials of different integrated models, and cultural adaptation of screening instruments and interventions for African populations. For clinicians, adopting a holistic, patient-centred approach that inquires about mood, sleep, and distress as routinely as blood glucose levels is critical. Policymakers must develop and fund national guidelines mandating mental health integration, train primary care providers, and establish sustainable referral systems to reduce overall healthcare burden and improve patient outcomes.

Recommendations

The findings of this review underscore the urgent need for a more integrated approach to the management of Type 2 Diabetes Mellitus (T2DM), one that recognises and addresses the substantial burden of mental health disorders experienced by individuals living with the condition. To achieve this, routine mental health screening should be incorporated into standard diabetes care protocols. Validated screening instruments such as the Patient Health Questionnaire-9 (PHQ-9), Generalised Anxiety Disorder-7 (GAD-7), and the Diabetes Distress Scale (DDS) should be administered during regular clinical encounters to facilitate the early identification of depression, anxiety, and diabetes-related distress. Early recognition of these conditions can promote timely intervention, reduce the severity of psychological symptoms, and minimise their negative impact on glycaemic control, treatment adherence, and overall quality of life. In addition, mental health professionals should be formally integrated into multidisciplinary diabetes care teams. Psychologists, psychiatrists, counsellors, and other behavioural health specialists can play a critical role in providing psychological assessments, counselling services, coping skills training, and evidence-based therapeutic

interventions. Their collaboration with physicians, nurses, dietitians, and other healthcare providers would ensure a holistic approach to patient management that addresses both the physical and psychological aspects of diabetes care. Efforts should also be directed toward strengthening psychoeducation and social support mechanisms for individuals with T2DM and their families. Structured psychoeducational programmes can improve understanding of the disease, enhance self-management capabilities, and increase awareness of the relationship between mental health and diabetes outcomes. Similarly, peer support groups can provide emotional support, reduce feelings of isolation, encourage the sharing of experiences, and foster resilience among patients. These interventions should be standardised, accessible, and incorporated into routine clinical pathways to maximise their effectiveness. Furthermore, healthcare providers should adopt culturally sensitive and patient-centred models of care. Diabetes management strategies should be tailored to accommodate patients' cultural beliefs, language preferences, health perceptions, and socioeconomic circumstances. Involving patients in shared decision-making and individualised care planning can enhance engagement, improve adherence to treatment recommendations, and ultimately lead to better health outcomes. Such approaches recognise the unique needs and experiences of each patient and promote more equitable healthcare delivery. The increasing availability of digital health technologies presents another opportunity to improve access to mental health services among individuals with T2DM. Telemedicine platforms, mobile health applications, and online counselling services can provide convenient, affordable, and scalable mental health support, particularly for patients living in rural or underserved areas where specialist services may be limited. Expanding the use of these technologies can help bridge existing gaps in care and improve continuity of support. At the system level, policymakers and healthcare administrators should address barriers to integrating mental and physical healthcare services. Sustainable funding mechanisms, workforce training, effective referral pathways, interoperable health information systems, and supportive policies are essential for the successful implementation of integrated care models. Finally, healthcare systems should embrace a preventive and holistic model of diabetes care that prioritises emotional well-being, resilience, and patient empowerment alongside disease management. Such an

approach has the potential to improve patient outcomes, reduce complications, enhance quality of life, and lower healthcare costs over the long term.

Conclusion

Mental illness is very prevalent in individuals with T2DM, contributing significantly to the challenge of disease management and worsening health outcomes. Depression, anxiety disorders, diabetes-specific distress, eating disorders, cognitive impairment, sleep disorders, PTSD, substance abuse disorders, psychotic disorders, and adjustment disorders are all well in excess of those in the general population. Such comorbidities are the consequence of a complex interplay of biological, psychological, and social processes, including the chronic stress of diabetes self-management, fear of complications, metabolic instability, and the psychological burden of a lifetime illness. The bidirectionality of diabetes and mental illness suggests a vicious cycle: impaired mental health impairs diabetes self-care, and impaired diabetes control worsens psychological well-being, with a final common pathway of elevated risk for complications, hospitalisations, and death. Traditional disease-focused care models tend to overlook these psychological factors, resulting in fragmented and ineffective treatment strategies. However, there is robust evidence for the integration of mental healthcare into diabetes treatment as a central component for improvement of adherence, glycaemic control, and overall quality of life.

Declarations

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