**DIABETES AND MENTAL HEALTH: A RISING CONCERN**

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**ABSTRACT**

By 2030, the World Health Organisation predicts that there will be more than 350 million people with diabetes globally, more than tripling from the year 2000. The negative effects of this chronic condition and its consequences are being amplified globally by rising diabetes incidence among younger age groups. The capacity of about one-third of diabetics to self-manage their diabetes is hampered by psychological and/or social issues. Early detection and treatment of co-morbid mental health issues will be possible by identifying specific signs that point to a high likelihood of such issues. It would be beneficial to the persons' health to ensure that any mental health issues are handled and social requirements are satisfied. Reducing the burden of diabetes and its consequences on both the individual and the larger health system can be accomplished by addressing the mental and psychological obstacles to maintaining excellent glucose control.

Keywords: diabetes, mental health, anxiety, exercise

**INTRODUCTION**

By 2030, the World Health Organisation predicts that there will be more than 350 million people with diabetes globally, more than tripling from the year 2000. The negative effects of this chronic condition and its consequences are being amplified globally by rising diabetes incidence among younger age groups [1]. Beyond individual impairment and increased mortality, diabetes has social consequences such as lost production and higher healthcare expenses [2]. Research has progressively demonstrated a connection between diabetes and a number of mental health conditions. These include psychological conditions that can be diagnosed as well as additional issues unique to having diabetes. "Diabetes distress" refers to the unfavourable feelings and self-management burden associated with having diabetes. This phrase refers to the depression and mental anguish that are uniquely associated with having diabetes, including the requirement for ongoing care and medication, ongoing worries about complications, and the possible damage to relationships with family, friends, and coworkers. Reluctance or unwillingness to begin insulin therapy, which may cause a temporary delay in the initiation of required treatment, is referred to as "psychological insulin resistance" [3]. Another typical worry related to diabetes is the fear of hypoglycemia. Reduced engagement in self-management activities is linked to the prevalence of mental and diabetes-specific psychosocial disorders, which might lower quality of life. Diabetes complications and early death are more likely in those with psychiatric illnesses [4].

Recent research suggests that anxiety problems in adults with diabetes may also be linked to less favourable glycemic management. 40% of diabetic patients who took part in clinical investigations had higher anxiety symptoms, according to a comprehensive study. Up to 14% of diabetic individuals have been observed to have generalised anxiety disorder [5], a prevalent anxiety condition. Estimates of the size of the relationship between diabetes and depression in population-based research vary, with estimates ranging from small changes to a two-fold increase in risk [6]. The sample size, diabetes and depression case identification procedures, sample characteristics, and use of a prospective or cross-sectional design were among the methodological variations between these research. Of course, chance variation in estimates of the degree of connection might also play a role in explaining why some research differs from others [7].

**EPIDEMIOLOGY**

Over the past 13 years, the volume of research supporting the link between diabetes and mental illness has grown. Rustad et al. have shed light on the bi-directional pathophysiological relationship between diabetes and depression, but other important proposed aetiologies include the activation of the innate immune system and increased activity of the hypothalamic-pituitary axis [8]. The correlations between non-adherence to treatment, poor glycemic control, and increased complications (such as diabetic retinopathy, nephropathy, neuropathy, macrovascular issues, and sexual dysfunction) highlight the significance of a dual diagnosis of diabetes and depression. The odds ratio (OR) for anxiety disorder was 1.20 (1.10-1.31) and for anxiety symptoms was 1.48 (1.02-1.93) in a meta-analysis by Smith et al. in 2012, whereas the pooled OR was 1.25 (1.10-1.39). It has also been demonstrated that anxiety disorders identified by diagnostic interviews are highly related to inadequate glycemic control. [9]

**PSYCHOLOGICAL EFFECTS OF DIABETES**

DIABETES DISTRESS- It consists of four interrelated domains: the emotional toll of having diabetes; the stress associated with diabetes self-management; the anxiety associated with social interactions; and the stress involved with the relationship between the patient and the physician. High glycated haemoglobin (A1C levels), higher diastolic blood pressure (BP), and higher levels of low-density lipoprotein cholesterol (LDL-C) are all linked to diabetes discomfort [10]. Additionally, people with greater levels of diabetic distress were shown to have worse quality of life, a 1.8-fold higher death rate, and a 1.7-fold higher risk of cardiovascular disease (CV) illness [11].

FEAR OF HYPOGLYCEMIA-It happens frequently. Both the person experiencing the hypoglycemia and their family members may suffer from traumatic effects, particularly if the episode is severe or occurs at night. Compensatory hyperglycemia, where people either maintain a higher blood glucose (BG) level as a preventative measure or treat hypoglycemia in response to perceived somatic symptoms without objective confirmation by capillary blood glucose concentrations, is a common tactic to reduce fears of hypoglycemia. Leaving this maladaptive process unchecked over time can have detrimental effects on diabetes management, raise the risk of cardiovascular problems, and lower quality of life [12].

MAJOR DEPRESSIVE DISORDER-About 30% of persons with diabetes report having clinically significant depression symptoms. About 10% of persons have MDD, twice as common as those without a chronic medical condition. The length of time a person has diabetes raises the risk of MDD [13]. Contrary to undiagnosed diabetes, clinically recognised diabetes was not linked to a rise in antidepressant prescriptions, supporting the idea that diabetes management-related variables may play a role in the association between diabetes and depression. Type 2 diabetes is more likely to develop in those who have depression by 40% to 60% [14].

BIPOLAR DISORDER-According to one study, poor glucose metabolism was detected in more than 50% of bipolar disorder patients, which was proven to exacerbate several important elements of mood illness's progression. Impaired glucose tolerance (IGT) was identified as an etiologic component in the development of bipolar illness in the same investigation (80). Diabetes and metabolic syndrome are believed to be twice as common in people with bipolar illness as they are in the general population [15].

SCHIZOPHRENIA SPECTRUM DISORDER-Diabetes risk may be independently attributed to schizophrenia and other psychotic diseases. Prior to the development of antipsychotic medications, people with psychotic illnesses were reportedly more likely to have insulin resistance or glucose intolerance, however, this claim is still debatable. Metabolic syndrome was almost twice as common as the overall population [16].

PERSONALITY TRAIT DISORDER-Type 2 diabetes risk has been reported to rise with personality characteristics or illnesses that cause persons to be hostile or in frequent confrontations with others. People with social inhibition and persistent, severely negative mood states were less likely to maintain a healthy diet or seek medical help if issues arose with their diabetes treatment. They detail increased obstacles to taking medications, diabetes-specific social anxiety, loneliness, and depressive and anxious symptoms [17].

ANXIETY-Depressive symptoms frequently coexist with anxiety. According to one study, 14% of people with diabetes had a generalised anxiety disorder, double this number had a subclinical anxiety disorder, and three times this number had at least some anxiety symptoms. One-third of persons with severe mental diseases and type 2 diabetes had anxiety problems, which were linked to worsening depressive symptoms and reduced levels of function. An increased risk of type 2 diabetes has been linked to persistent worry [18].

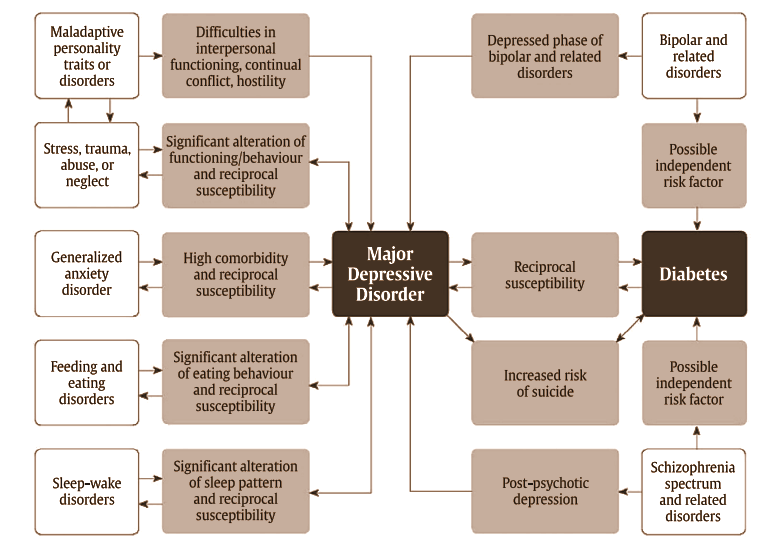


Figure 1- Interplay between diabetes and psychiatric conditions

**REHABILITATION TREATMENT**

Efforts to promote well-being to mitigate distress should be incorporated into diabetes management for all individuals. Motivational interventions, coping skills, self-efficacy enhancement, stress management and family interventions all have been shown to be helpful [19].

Among adults with type 2 diabetes and subclinical depression, Cognitive behaviour therapy (CBT) resulted in reductions in diabetes distress and depressive symptoms compared to controls (190). Lower diabetes regimen distress (produced by an intervention combining education, problem-solving and support for accountability) led to improvements in medication adherence, physical activity and decreased A1C over 1 year .. Recent research suggests that CBT can be used to address psychological insulin resistance by specifically addressing the beliefs that underlie it [20]. Many people who exercise claim to do so for its beneficial effects on their mental health. The findings of Gillison et al.'s meta-analysis lend credence to this assertion. They discovered that exercise improves a healthy person's self-reported quality of life [21]. The evidence for an improvement in patients' self-reported quality of life has, however, been scant or contradictory, as Reid et al pointed out [22]. A moderate-intensity aerobic exercise programme, according to Dixit et al [23] increased the quality of life for individuals with peripheral neuropathy and type 2 diabetes. According to Nicolucci et al [24], there is a correlation between changes in quality-of-life metrics linked to physical and mental health and the amount of exercise or physical activity undertaken. They also stated that under supervision, fitness training appeared to enhance these advantages [25]. Exercise has recognised impacts on disorders, such as major depressive disorder, that are expected to be comorbid in patients with diabetes mellitus (DM), regardless of what findings are made in the future DM-specific study [26]. Exercise can help DM patients develop self-control behaviours that will improve their adherence to treatment plans. Additionally, weight reduction and improvements in body composition and appearance that follow from exercise might improve patients' self-images of their bodies.

**CONCLUSION**

A person's behaviour and psychological well-being are both impacted by diabetes mellitus. From the very beginning of the condition, patients with diabetes mellitus need early psychosocial therapy in addition to medications and exercise in order to reduce co-morbidities.

**REFERENCES**

1. Wild S, Roglic G, Green A, Sicree R, King H. Global prevalence of diabetes: estimates for the year 2000 and projections for 2030. Diabetes Care 2004;27:1047–53.
2. Pinhas-Hamiel O, Zeitler P. The global spread of type 2 diabetes mellitus in children and adolescents. J Pediatr 2005;146:693–700
3. Polonsky WH, Hajos TR, Dain MP, et al. Are patients with type 2 diabetes reluctant to start insulin therapy? An examination of the scope and underpinnings of psychological insulin resistance in a large, international population. Curr Med Res Opin 2011;27:1169–74.
4. Egede LE, Nietert PJ, Zheng D. Depression and all-cause and coronary heart disease mortality among adults with and without diabetes. Diabetes Care 2005;28:1339–45
5. Grigsby AB, Anderson RJ, Freedland KE, Clouse RE, Lustman PJ. Prevalence of anxiety in adults with diabetes: a systematic review. J Psychosom Res 2002;53:1053–60.
6. Zhang J, Markides KS, Lee DJ. Health status of diabetic Mexican Americans: results from the Hispanic HANES. Ethn Dis 1991;1: 273–9.
7. Wells KB, Golding JM, Burnam MA. Chronic medical conditions in a sample of the general population with anxiety, affective, and substance use disorders. Am J Psychiatry 1989;146:1440–6
8. Rustad JK, Musselman DL, Nemeroff CB. The relationship of depression and diabetes: pathophysiological and treatment implications. Psychoneuroendocrinology 2011;36:1276–86.
9. Gonzalez JS, Peyrot M, McCarl LA et al. Depression and diabetes treatment nonadherence: a meta-analysis. Diabetes Care 2008;31:2398–403.
10. Winchester RJ, Williams JS, Wolfman TE, et al. Depressive symptoms, serious psychological distress, diabetes distress and cardiovascular risk factor control in patients with type 2 diabetes. J Diabetes Complications 2016;30:312–17.
11. Carper MM, Traeger L, Gonzalez JS, et al. The differential associations of depression and diabetes distress with quality of life domains in type 2 diabetes. J Behav Med 2014;37:501–10.
12. Hendrieckx C, Halliday JA, Bowden JP, et al. Severe hypoglycaemia and its association with psychological well-being in Australian adults with type 1 diabetes attending specialist tertiary clinics. Diabetes Res Clin Pract 2014;103: 430–6.
13. Anderson RJ, Freedland KE, Clouse RE, et al. The prevalence of comorbid depression in adults with diabetes: A meta-analysis. Diabetes Care 2001;24:1069– 78
14. Mezuk B, Johnson-Lawrence V, Lee H, et al. Is ignorance bliss? Depression, antidepressants, and the diagnosis of prediabetes and type 2 diabetes. Health Psychol 2013;32:254–63.
15. Mansur RB, Rizzo LB, Santos CM, et al. Impaired glucose metabolism moderates the course of illness in bipolar disorder. J Affect Disord 2016;195:57–62
16. McEvoy JP, Meyer JM, Goff DC, et al. Prevalence of the metabolic syndrome in patients with schizophrenia: Baseline results from the Clinical Antipsychotic Trials of Intervention Effectiveness (CATIE) schizophrenia trial and comparison with national estimates from NHANES III. Schizophr Res 2005;80:19–32.
17. Nefs G, Speight J, Pouwer F, et al. Type D personality, suboptimal health behaviors and emotional distress in adults with diabetes: Results from Diabetes MILESThe Netherlands. Diabetes Res Clin Pract 2015;108:94–105.
18. Hasan SS, Clavarino AM, Mamun AA, et al. Anxiety symptoms and the risk of diabetes mellitus in Australian women: Evidence from 21-year follow-up. Public Health 2016;130:21–8.
19. Armour TA, Norris SL, Jack L Jr, et al. The effectiveness of family interventions in people with diabetes mellitus: A systematic review. Diabet Med 2005;22:1295–305.
20. Barnard K, Thomas S, Royle P, et al. Fear of hypoglycaemia in parents of young children with type 1 diabetes: A systematic review. BMC Pediatr 2010;10: 50
21. Gillison FB, Skevington SM, Sato A, Standage M, Evangelidou S. The effects of exercise interventions on quality of life in clinical and healthy populations: a meta-analysis. Soc Sci Med 68:1700–1710, 2009.
22. Reid RD, Tulloch HE, Sigal RJ, Kenny GP, Fortier M, McDonnell L, Wells GA, Boule NG, Phillips P, Coyle D. Effects of aerobic exercise, resistance exercise or both, on patient-reported health status and well-being in type 2 diabetes mellitus: a randomised trial. Diabetologia 53:632–640, 2010.
23. Dixit S, Maiya A, Shastry B. Effect of aerobic exercise on quality of life in population with diabetic peripheral neuropathy in type 2 diabetes: a single-blind, randomized controlled trial. Qual Life Res 23:1629–1640, 2014.
24. Nicolucci A, Balducci S, Cardelli P, Cavallo S, Fallucca S, Bazuro A, Simonelli P, Iacobini C, Zanuso S, Pugliese G; Italian Diabetes and Exercise Study. Relationship of exercise volume to improvements of quality of life with supervised exercise training in patients with type 2 diabetes in a randomised controlled trial: the Italian Diabetes and Exercise Study (IDES). Diabetologia 55:579–588, 2012.
25. Blumenthal JA, Babyak MA, Doraiswamy PM, Watkins L, Hoffman BM, Barbour KA, Herman S, Craighead WE, Brosse AL, Waugh R, Hinderliter A, Sherwood A. Exercise and pharmacotherapy in the treatment of major depressive disorder. Psychosom Med 69:587–596, 2007.
26. Zhao GX, Ford ES, Li CY, Balluz LS. Physical activity in U.S. older adults with diabetes mellitus: prevalence and correlates of meeting physical activity recommendations. J Am Geriatr Soc 59:132–137, 2011.