

Silent Struggles: Suicidal Behaviors and Depression in Type-1 Diabetes

Mahum Tanveer¹, Erum Ghafoor², Nazish Imran³

SUMMARY

This review article focuses on the existing literature on suicidal thoughts and behavior among individuals with type 1 diabetes and guides about the interventions present to reduce the suicide risk in this population. The review shows that people struggling with type 1 diabetes are particularly susceptible to depression and suicidal ideation as compared with their peers without diabetes. Several recent studies showed heightened rates of suicidal ideation, suicidal attempts and completed suicides among persons with type 1 diabetes and financial drain and burden of illness are found to be major aggravating factors. This review stresses the importance of reliable identification of individuals with suicidal tendencies and integration of mental health screening to mitigate the risk.

INTRODUCTION

Suicide, one of the leading causes of deaths worldwide, is the biggest dilemma faced by mental health professionals. According to WHO, suicide is the contributing factor of 700,000 deaths worldwide annually for all age groups whereas among individuals aged 15-29 years, it is the fourth leading cause of death.¹ The overall suicide rate has increased 30% from 2000 to 2020.² One of the major causative factors in development of suicidal ideation is chronic health conditions due to the major mental burden associated with them.³ One such chronic health condition is type 1 diabetes.

Type 1 diabetes is a chronic, autoimmune type of diabetes mellitus, characterized by beta cell destruction, resulting in insulin deficiency and resulting hyperglycemia.⁴ Living with type 1 diabetes is a daily balancing act due to its constant mental strain, poor quality of life and burden of care.⁵ As a consequence, patients with type 1 diabetes are at greater risk of depression, suicidal ideation and suicidal attempts as compared to general population or type 2 diabetics.⁶

The Link Between Depression, Suicidal Behaviors & Type 1 Diabetes

Suicidal ideation could be traced back to high prevalence of depression among patients with diabetes. The relation between depression and diabetes is complex, multifaceted and bidirectional. Both conditions often coexist and there has been a lot of research done to investigate the etiology behind this phenomenon. Patients with type 1 diabetes are more likely to have depression and more likely to be on antidepressant medications than nondiabetic individuals.⁷ In a study conducted in adolescents with type 1 diabetes aged 10 to 17 in Jordan, 46% showed significant depressive symptoms.⁸

There are multiple shared pathways elicited between depression and diabetes. Chronic stress stimulates the sympathetic nervous system and hypothalamic-pituitary-adrenal axis, resulting in increased cortisol and adrenaline production that can trigger depression or diabetes and both.⁹ Certain inflammatory mediators also contribute to development of depression in diabetic population.¹⁰ A study pointed towards the role of tryptophan. Tryptophan levels were decreased in diabetics, contributing to decreased serotonin

Address for Correspondence: Nazish Imran, MBBS; FRCPsych(London); MRCPsych (London); MHPE; PhD Professor, Child & Family Psychiatry Department. King Edward Medical University/ Mayo Hospital, Lahore, Pakistan. E mail: nazishimrandr@gmail.com.

Submitted: August 09, 2024 **Revision Received:** September 13, 2024

Accepted for Publication: November 19, 2024

Access this Article Online

URL:
<https://jpes.org.pk/index.php/jpes/article/view/24>

How to cite this: Tanveer M, Ghafoor E, Imran N. Silent Struggles: Suicidal Behaviors and Depression in Type-1 Diabetes. JPES. 2024;1(2):83-86.

This is an open access article distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/3.0>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

production and resulting depression.¹¹ There is also a direct link between depressive symptoms and HbA1C levels, depicting role of mood disorders in adherence with treatment in diabetic patients.¹²

Prevalence Of Suicidal Behaviors In Type 1 Diabetes

Research paints a grim picture of incidence of suicide among diabetics, particularly type 1 diabetics. Literature shows that type 1 diabetes was associated with higher risk of suicidal ideation and suicidal attempts. Pompili et al. conducted a systematic review of 20 studies and concluded that patients with type 1 diabetes were at higher risk of suicide than general population although level of increased risk was not defined.¹³

A meta-analysis of 54 studies showed that the relative risk of suicide in type 1 diabetics was 2.25. The proportion of deaths due to suicide was found to be 7.7% in type 1 DM as compared to 1.3% in type 2 DM patients.¹⁴ During a suicide risk assessment interview conducted by Majidi et al. 9% of youth and young individuals had suicidal ideation and half the individuals reported that they have experienced suicidal ideation in the past two weeks. 16% of the youths with suicidal ideation have previously attempted to commit suicide, with one youth making multiple attempts.¹⁵ Data from a regionally representative sample obtained from the Canadian Community Health Survey conducted by Statistics Canada showed that the lifetime prevalence of suicidal ideation was 15% in type 1 diabetics as compared to 9% in those without diabetes.¹⁶

Children and adolescents were particularly sensitive to the mental toll of disease. A study showed that out of 473 adolescents aged 13-17 years with type 1 diabetes, 27% exhibited moderate to high risk depression and 8% endorsed suicidal ideation.¹⁷ A cohort study conducted on children with type 1 diabetes born in Sweden between 1973 and 2009 showed that children with type 1 diabetes were 1.7 times more likely to attempt suicide than the control subjects.¹⁸ In Canada, 3544 adolescents with type 1 diabetes aged 15 were followed till 25 years of age. Contrary to their control counterparts, these adolescents were 1.33 times more likely to suffer from a mood disorder and 3.25 times more likely to attempt suicide.¹⁹

Psychological And Social Factors Influencing Suicide Risk

Type 1 diabetes is a challenging and burdensome disease that requires continuous care by the youth and his/her family members. The daily management to ensure a positive long term outlook is time-consuming. The youth have to balance diet, exercise and meticulous use of insulin to ensure better quality of life and it can impact the functioning over time as well as serving as a causative agent of various conflicts within the family.²⁰ Interpersonal-psychological theory of suicide

(IPTS) proposes that the desire for death results from the presence of two proximal risk factors: thwarted belongingness and perceived burdensomeness. Thwarted belongingness is a chronic feeling of loneliness and perceived burdensomeness is the perception of being a financial drain on family and parents. Individuals with type 1 DM experience both these phenomena.²¹

Another factor to consider is the financial drain associated with diabetes. The cost of Insulin is soaring high and to add to the injury, the patient needs lifetime access to monitoring devices. One in four individuals ration their insulin use which can further lead to complications that requires visits to hospitals and undergoing various investigations and procedures.²²

Diabetics have access to lethal doses of insulin that can be used in potentially harmful manners. The resulting hypoglycemia could lead to brain injury, coma and even death if not treated promptly. Self-administration of Insulin is one of the most common methods of suicide in diabetics and the risk increases in type 1 Diabetes Mellitus owing to sole dependency on injectables.⁹ A study showed that insulin was used as a method to commit suicide in half of the type 1 diabetics committing suicide while the number was significantly lower in type 2 diabetics. Alcohol was also a contributory factor in those suicides as half of the suicide victims in type 1 diabetes were under effect of alcohol at the time of committing suicide.²³ A review of fatal insulin overdoses in South Australia over a 20-year period showed that 72% of the cases were suicides while the rest were accidental or of undetermined intent.²⁴

Diabetes And Suicidal Behaviors in Pakistani Population

The estimate of the Pakistani population suffering from diabetes is alarmingly high and the rate is increasing with each passing year. The reason might be the high prevalence of central and generalized obesity, processed food and sedentary lifestyle.²⁵ According to the International Diabetes Federation, in 2022, 26.7% of adults in Pakistan are affected by diabetes making the total number of cases approximately 33 million.²⁶ The prevalence of type 1 diabetes is lower compared to type 2 diabetes, which is more common in the adult population.

However, the exact prevalence can vary, and obtaining accurate statistics can be challenging due to factors such as underreporting and limited access to healthcare in some regions.

Despite the huge number, the literature related to prevalence of suicidal ideation in youth is scarce, with the information related to type 1 diabetes almost non-existent. Suicidal ideation was elicited in 30% individuals with type 2 diabetics in a study conducted in Karachi, Pakistan²⁷ but there is no work done presently for type 1 diabetics. A study conducted in tertiary care hospital of Lahore; Pakistan showed elevated levels of distress among individuals with type 1 diabetes, but the question of suicidal ideation was not targeted.²⁸

Psychosocial Interventions

Psychosocial support and mental health interventions are essential components of comprehensive diabetes care to address the underlying emotional and psychological challenges that increase the risk of suicide.

Early identification and treatment of mental health issues in individuals with Type 1 Diabetes are critical for reducing suicide risk and improving overall quality of life. Reliable identification of individuals with suicidal tendencies is crucial given the high prevalence of suicide among youth with type 1 diabetes and easy access to lethal means. Depression screeners could be used to identify high risk individuals before they develop suicidal behaviors and direct them towards appropriate behavioral services. There are multiple depression screeners used by professionals i.e. PHQ-2, PHQ-9 and C-SSRS. Although there is evidence that these screeners under identify youth with suicidal ideation, they can provide a preliminary basis for the identification.²⁹

Furthermore, following strategies have been used in youths for suicide prevention: Education-based universal prevention programs, brief safety-focused interventions (e.g., means safety interventions, safety planning, crisis response planning), and psychosocial interventions (e.g., The Collaborative Assessment and Management of Suicidality, dialectical behavior therapy, cognitive behavioral therapy.²¹ Means safety intervention targets to limit the access of an individual to items that can be used for suicide. Counseling on Access to Lethal Means (CALM) is an intervention that teaches professionals to identify high risk individuals and work efficiently to reduce their access to lethal means when they experience suicidal ideations.³⁰

CONCLUSION

Chronic illnesses like diabetes increase the risk of suicide in individuals. The prevalence of suicidal ideation among individuals, especially youth, suffering from type 1 diabetes is particularly alarming. This could be due to underlying depression, the psychosocial factors, mental burden associated with the disease and the easy access to fatal doses of Insulin. The risk of suicide in developing countries like Pakistan is especially high, where one-fourth of the total population is suffering from diabetes however the risk has yet to be estimated quantitatively. There are a lot of preventive strategies that can help an individual harboring suicidal ideation before it could lead them towards a suicide attempt. Those strategies target the access of lethal means by the individual and find means to identify high risk individuals to lead them towards professionals. With a multidisciplinary approach, we can look forwards to a future where our youth wouldn't have to deal with these negative feelings and stigma associated with diabetes alone and the risk of

self-harm would be minimal. The integration of mental health screening and diabetes management could provide a more holistic approach to care, potentially mitigating the heightened suicide risk observed in this population.

Grant Support & Financial Disclosures: None.

REFERENCES

1. Suicide [Internet]. Who.int. [cited 2024 Apr 14]. Available from: <https://www.who.int/news-room/fact-sheets/detail/suicide>
2. Garnett MF, Curtin SC, Stone DM. Suicide mortality in the United States, 2000-2020. NCHS Data Brief. 2022;(433):1-8.
3. Gürhan N, Beşer NG, Polat Ü, Koç M. Suicide risk and depression in individuals with chronic illness. Community Ment Health J [Internet]. 2019;55(5):840-8. Available from: <http://dx.doi.org/10.1007/s10597-019-00388-7>
4. DiMeglio LA, Evans-Molina C, Oram RA. Type 1 diabetes. Lancet [Internet]. 2018;391(10138):2449-62. Available from: [http://dx.doi.org/10.1016/s0140-6736\(18\)31320-5](http://dx.doi.org/10.1016/s0140-6736(18)31320-5)
5. Barnard-Kelly KD, Naranjo D, Majidi S, Akturk HK, Breton M, Courtet P, et al. Suicide and self-inflicted injury in diabetes: A balancing act. J Diabetes Sci Technol [Internet]. 2020;14(6):1010-6. Available from: <http://dx.doi.org/10.1177/1932296819891136>
6. Sarkar S, Balhara YPS. Diabetes mellitus and suicide. Indian J Endocrinol Metab [Internet]. 2014;18(4):468-74. Available from: <http://dx.doi.org/10.4103/2230-8210.137487>
7. Gendelman N, Snell-Bergeon JK, McFann K, Kinney G, Paul Wadwa R, Bishop F, et al. Prevalence and correlates of depression in individuals with and without type 1 diabetes. Diabetes Care [Internet]. 2009;32(4):575-9. Available from: <http://dx.doi.org/10.2337/dc08-1835>
8. Alassaf A, Gharaibeh L, Zurikat RO, Farkouh A, Ibrahim S, Zayed AA, et al. Prevalence of depression in patients with type 1 diabetes between 10 and 17 years of age in Jordan. J Diabetes Res [Internet]. 2023;2023:3542780. Available from: <http://dx.doi.org/10.1155/2023/3542780>
9. Abdelmageed RM, Mohammed Hussein SM. Risk of depression and suicide in diabetic patients. Cureus [Internet]. 2022;14(1):e20860. Available from: <http://dx.doi.org/10.7759/cureus.20860>
10. Moulton CD, Pickup JC, Ismail K. The link between depression and diabetes: the search for shared mechanisms. Lancet Diabetes Endocrinol [Internet]. 2015;3(6):461-71. Available from: [http://dx.doi.org/10.1016/S2213-8587\(15\)00134-5](http://dx.doi.org/10.1016/S2213-8587(15)00134-5)
11. Haider S. Greater prevalence of depression in type I diabetic patients: Correlation with decreased plasma tryptophan. IOSR J Pharm [Internet]. 2012;2(1):57-61. Available from: <http://dx.doi.org/10.9790/3013-021005761>
12. Wigglesworth KRS, Vigers T, Pyle L, Youngkin EM, Fay-Itzkowitz E, Tilden J, et al. Follow-up mental health care in youth and young adults with type 1 diabetes after positive depression screen and/or suicidal ideation. Clin Diabetes [Internet]. 2022 Autumn;40(4):449-57. Available from: <http://dx.doi.org/10.2337/cd21-0128>
13. Pompili M, Forte A, Lester D, Erbuto D, Rovedi F, Innamorati M, et al. Suicide risk in type 1 diabetes mellitus: A systematic review. J Psychosom Res [Internet]. 2014;76(5):352-60. Available from: <http://dx.doi.org/10.1016/j.jpsychores.2014.02.009>
14. Wang B, An X, Shi X, Zhang J-A. MANAGEMENT OF ENDOCRINE DISEASE: Suicide risk in patients with diabetes: a systematic review and meta-analysis. Eur J Endocrinol [Internet]. 2017;177(4):R169-81. Available from: <http://dx.doi.org/10.1530/EJE-16-0952>
15. Majidi S, O'Donnell HK, Stanek K, Youngkin E, Gomer T, Driscoll KA. Suicide risk assessment in youth and young adults with type 1 diabetes. Diabetes Care [Internet]. 2020;43(2):343-8. Available from: <http://dx.doi.org/10.2337/dc19-0831>
16. Fuller-Thomson E, Sawyer J-L. Lifetime prevalence of suicidal ideation in a representative sample of Canadians with type 1 diabetes. Diabetes Res Clin Pract [Internet]. 2009;83(1):e9-11. Available from: <http://dx.doi.org/10.1016/j.diabetes.2008.10.004>

17. Matlock KA, Yayah Jones N-H, Corathers SD, Kichler JC. Clinical and psychosocial factors associated with suicidal ideation in adolescents with type 1 diabetes. *J Adolesc Health* [Internet]. 2017;61(4):471–7. Available from: <http://dx.doi.org/10.1016/j.jadohealth.2017.05.004>
18. Butwickia A, Frisén L, Almqvist C, Zethelius B, Lichtenstein P. Risks of psychiatric disorders and suicide attempts in children and adolescents with type 1 diabetes: a population-based cohort study. *Diabetes Care* [Internet]. 2015;38(3):453–9. Available from: <http://dx.doi.org/10.2337/dc14-0262>
19. Robinson M-E, Simard M, Larocque I, Shah J, Nakhla M, Rahme E. Risk of psychiatric disorders and suicide attempts in emerging adults with diabetes. *Diabetes Care* [Internet]. 2020;43(2):484–6. Available from: <http://dx.doi.org/10.2337/dc19-1487>
20. Bollepalli S, Smith LB, Vasquez A, Rodriguez H, Vehik K. Addressing the burdens of Type 1 diabetes in youth. *Clin Pract (Lond)* [Internet]. 2012;9(4):409–24. Available from: <http://dx.doi.org/10.2217/cpr.12.33>
21. Hill RM, Gallagher KAS, Eshtehardi SS, Uysal S, Hilliard ME. Suicide risk in youth and young adults with type 1 diabetes: A review of the literature and clinical recommendations for prevention. *Curr Diab Rep* [Internet]. 2021;21(12):51. Available from: <http://dx.doi.org/10.1007/s11892-021-01427-y>
22. Grigorian EG, Litchman ML, Porter ME, Blanchette JE, Allen NA. Financial barriers in emerging adults with type 1 diabetes: A qualitative analysis. *Diabetes Spectr* [Internet]. 2022 Spring;35(2):190–7. Available from: <http://dx.doi.org/10.2337/ds21-0038>
23. Conti C, Mennitto C, Di Francesco G, Fraticelli F, Vitacolonna E, Fulcheri M. Clinical characteristics of diabetes mellitus and suicide risk. *Front Psychiatry* [Internet]. 2017;8:40. Available from: <http://dx.doi.org/10.3389/fpsy.2017.00040>
24. Stephenson L, van den Heuvel C, Humphries M, Byard RW. Characteristics of fatal insulin overdoses. *Forensic Sci Med Pathol* [Internet]. 2022;18(4):429–41. Available from: <http://dx.doi.org/10.1007/s12024-022-00511-3>
25. Azeem S, Khan U, Liaquat A. The increasing rate of diabetes in Pakistan: A silent killer. *Ann Med Surg (Lond)* [Internet]. 2022;79(103901):103901. Available from: <http://dx.doi.org/10.1016/j.amsu.2022.103901>
26. Pakistan [Internet]. International Diabetes Federation. 2023 [cited 2024 Apr 14]. Available from: <https://idf.org/our-network/regions-and-members/middle-east-and-north-africa/members/pakistan/>
27. Sharif H, Jan SS, Sharif S, Seemi T, Naeem H, Jawed Z. Depression and suicidal ideation among individuals with type-2 diabetes mellitus, a cross-sectional study from an urban slum area of Karachi, Pakistan. *Front Public Health* [Internet]. 2023;11:1135964. Available from: <http://dx.doi.org/10.3389/fpubh.2023.1135964>
28. Jabeen Z, Baig AM, Khawaja KI, Shabbir S, Afzal Z. Diabetes distress among type 1 diabetic adolescents in a tertiary care hospital in Pakistan. *Cureus* [Internet]. 2022;14(12):e32392. Available from: <http://dx.doi.org/10.7759/cureus.32392>
29. Moss AC, Roberts AJ, Yi-Frazier JP, Read KL, Taplin CE, Weaver KW, et al. Identifying suicide risk in adolescents and young adults with type 1 diabetes: Are depression screeners sufficient? *Diabetes Care* [Internet]. 2022;45(5):1288–91. Available from: <http://dx.doi.org/10.2337/dc21-1553>
30. Sale E, Hendricks M, Weil V, Miller C, Perkins S, McCudden S. Counseling on access to Lethal Means (CALM): An evaluation of a suicide prevention means restriction training program for mental health providers. *Community Ment Health J* [Internet]. 2018;54(3):293–301. Available from: <http://dx.doi.org/10.1007/s10597-017-0190-z>

Author's Contribution:

All authors contributed in conceiving the idea, literature search and drafting the manuscript.

AUTHORS:

1. Dr. Mahum Tanveer
Post graduate Resident
Academic Dept of Psychiatry & Behavioral Sciences
KEMU/MHL, Pakistan.
2. Ms. Erum Ghafoor
Baqai Institute of Diabetes & Endocrinology
Karachi - Pakistan.
3. Prof. Nazish Imran
MBBS; FRCPsych(London); MRCPsych (London); MHPE; PhD
Professor,
Child & Family Psychiatry Department.
King Edward Medical University/Mayo Hospital
Lahore, Pakistan.