Cureus
Part of SPRINGER NATURE

Open Access Original Article

The Hidden Struggle: Exploring Diabetes-Related Distress in a Hospital-Based Cross-Sectional Study

Abhinav Jayant Karajgi [1], B Nidhi Reddy Chepyala [1], Pidakala Mary Moses [2]

1. General Medicine, Mamata Academy of Medical Sciences, Hyderabad, IND 2. Community Medicine, Mamata Academy of Medical Sciences, Hyderabad, IND

Corresponding author: Abhinav Jayant Karajgi, abkarajgi@gmail.com

Review began 10/11/2026
Review ended 11/03/2026
Published 11/08/2026

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DOI: 10.7759/cureus.119329

Abstract

Background

Diabetes distress can be defined as the emotional and psychological burden associated with living with and managing diabetes. It is shown to be associated with higher HbA1c levels, along with other factors such as a lack of psychological and emotional support from family, friends and physicians. Despite this, it is often neglected in standard treatment regimens of diabetes. Recognising the psychological aspect of diabetes and addressing it will lead to an increase in overall clinical outcomes among patients.

Objectives

This study aims to assess the prevalence and impact of diabetes-related distress using the Diabetes Distress Scale (DDS-17). This study also aims to find the relationship between duration of diabetes, HbA1c levels, presence of comorbidities, gender, educational status and treatment regimens with the levels of distress experienced.

Methods

A cross-sectional study was conducted over six months at a tertiary care hospital, involving 235 confirmed patients with T2DM aged over 18 years. Data were collected using a pre-designed semi-structured questionnaire through face-to-face interviews, covering sociodemographic details, clinical history and HbA1c levels. Diabetes distress was measured using the DDS-17. Ethical clearance was obtained, and informed consent was collected. Statistical analysis was performed using IBM SPSS Statistics software, version 21.0 (IBM Corp., Armonk, NY), with significance set at $p<0.05$.

Results

A total of 235 participants were included in this study, of which 77% had clinically significant distress. The duration of diabetes, one or more comorbidities, poor glycaemic index and treatment-related challenges were the main contributing factors to distress. Patients with diabetes duration over 10 years had a significant distress percentage of 23.4% compared with 17.3% in patients with a duration of less than five years.

Conclusion

These particular findings emphasise the need to integrate routine psychological screening into diabetes care using the DDS-17. Physicians must focus on the psychological aspects of diabetes and subsequently improve communication with patients for a more holistic management approach.

Categories: Psychiatry, Public Health, Endocrinology/Diabetes/Metabolism
Keywords: diabetes distress, diabetes distress scale-17, glycaemic control, psychological aspect, type 2 diabetes mellitus

Introduction

Diabetes is a chronic condition that contributes to both morbidity and mortality, particularly observed in developing countries [1]. In India, there has been a steady increase in the prevalence of diabetes. The age-adjusted prevalence increased from 9% in 2011 to 10.8% by 2045 [1]. Diabetes now ranks among the top 10 causes of death nationwide [2]. A recent national survey reported that India has 101 million individuals living with diabetes and 136 million pre-diabetic individuals [3].

Despite significant progress made in the treatment of diabetes and glycaemic control strategies, the emotional and psychological burden of living with diabetes is often neglected. Such an unrecognised issue is diabetic distress, defined as the emotional distress caused by the daily demands of diabetes self-care [4]. Various factors lead to diabetes distress in patients with diabetes such as feelings of frustration, burnout and

exhaustion due to chronic self-care, restriction on diet and lack of empathy from family [4]. Unlike depression, diabetes distress is disease-specific and is linked to improper adherence to treatment, poor glycaemic control and development of long-term complications [5]. This emotional distress is often unrecognised by both patients and physicians and further results in low health-related quality of life (HRQoL) [6].

A recent systematic review conducted in India estimates that 33% of individuals with type 2 diabetes mellitus (T2DM) are affected by diabetes distress [7]. The management of diabetes distress in India is challenged by cultural stigma and limited resources surrounding mental health, and major differences in diabetes education across various regions [8]. To address these challenges, this study aims to assess the prevalence and contributing factors leading to diabetic distress among patients with diabetes in India. This study highlights the importance of integrating mental health screening in routine diabetic care, thereby promoting a patient-centred approach to disease management.

Materials And Methods

Study design

This was a hospital-based, cross-sectional, prospective observational study conducted over a period of six months at a tertiary care hospital. The study was carried out among patients diagnosed with T2DM attending the outpatient department during the study period. Participant recruitment was conducted from 03/02/2025 to 09/08/2025 at the outpatient department of the tertiary care hospital.

Study population and sampling

A total of 235 patients with T2DM were included in the study.

Sample Size Calculation

The required sample size (n) was calculated to estimate the prevalence of diabetes-related distress among patients with T2DM. Using a previously reported prevalence of 17.69% (p=0.1769) from a study by Purushottaman et al. [9], a 95% confidence level (Z=1.96), and an absolute precision of 5% (e=0.05), the minimum sample size was calculated using the formula:

$$n = \frac{Z^2 \cdot p \cdot (1-p)}{e^2}$$

$$n = \frac{1.96^2 \cdot 0.1769 \cdot (1-0.1769)}{0.05^2} \approx 224$$

Considering potential non-response, the final sample size was increased to 235 participants, ensuring adequate power to detect statistically significant associations. A consecutive sampling technique was used, in which all the eligible patients attending the outpatient clinic during the study period were approached and invited to participate until the required sample size was achieved.

Eligibility criteria

Inclusion Criteria

Adults aged ⩾18 years with a confirmed diagnosis of T2DM for at least one year and willingness to participate in a face-to-face interview were included in the study.

Exclusion Criteria

Pregnant or lactating women, patients with severe psychiatric disorders such as depression, psychosis or substance use disorders, and patients with terminal illnesses (e.g., chronic liver disease, advanced kidney disease or neurological illnesses requiring palliative care) were excluded.

Data collection

Data were collected using a pre-designed, semi-structured questionnaire through face-to -face interviews. The questionnaire included: sociodemographic details: age, gender, education and income; clinical history:

duration of diabetes, treatment regimen, presence of comorbidities and recent glycemic control as assessed by HbA1c levels; and psychological assessment: measurement of diabetes-related distress using the Diabetes Distress Scale (DDS-17) [6,10]. Although the DDS-17 questionnaire is originally in English, the questions were translated verbally into the participants' preferred language (Telugu) to ensure response accuracy.

Measurement of diabetes distress

The DDS-17 is a validated 17-item instrument that assesses diabetes-related emotional distress across four domains: 1. Emotional burden, 2. physician-related distress, 3. regimen-related distress and 4. interpersonal distress. Responses are scored on a six-point Likert scale ranging from 1 (“not a problem”) to 6 (“a very serious problem”). In this study, distress levels were categorised as follows: <2.0: little or no distress, 2.0-2.9: moderate distress and ⩾3.0: high distress [11]. Diabetes duration, HbA1c level, comorbidities, sex, educational level, and treatment regimen were recorded as demographic and clinical variables. The categorisation of these variables followed the definitions and categories used in the study data collection and analysis.

Statistical analysis

Data were entered and analysed using IBM SPSS Statistics software, version 21.0 (IBM Corp., Armonk, NY). Inferential statistics, including Chi-square tests and binary logistic regression, were performed to study the associations between diabetes distress levels and sociodemographic or clinical variables. A p-value <0.05 was considered statistically significant.

Ethical considerations

Ethical approval was obtained on 10/09/25 from the Institutional Ethical Committee of Mamata Academy of Medical Sciences (IEC/MAMS/2025/178) for a retrospective study.

Results

Out of the 235 participants in this study, as shown in Table *1*, 143 (60.9%) participants were male, and 92 (39.1%) were female. Forty-eight (20.4%) participants were under the age of 45 years, 52 (22.1%) participants were between the ages of 45 and 55, and 135 (57.4%) participants were above 55 years. In terms of education, the majority were graduates (43.4%) and postgraduates (30.2%), while illiterates accounted for only 1.3%. Based on the criteria of monthly income, 46.4% of participants earned more than ₱1 lakh per month, whereas 11.9% earned less than ₱10,000. The majority, 41.7%, of patients had diabetes for less than five years, 27.7% for 10-15 years, and 12.3% for more than 15 years. A positive family history was found in 62.6% of patients.

Variable		Frequency (%)
Age	<45 years	48 (20.4%)
	45-55 years	52 (22.1%)
	>55 years	135 (57.4%)
Gender	Male	143 (60.9%)
	Female	92 (39.1)
Education	Illiterate	3 (1.3%)
	Primary school	11 (4.7%)
	High school	18 (7.7%)
	Intermediate	30 (12.8%)
	Graduate	102 (43.4%)
	Postgraduate	71 (30.2%)
Monthly income	<₹10,000	28 (11.9%)
	₹10,000- ₹40,000	40 (17%)
	₹40,000-₹1 lakh	58 (24.7%)
	>₹1 lakh	109 (46.4)
Duration of diabetes	<5 years	98 (41.7%)
	5-10 years	43 (18.3%)
	10-15 years	65 (27.7%)
	>15 years	29 (12.3%)
Family history of diabetes	Yes	147 (62.6%)
	No	88 (37.4%)

TABLE 1: Sociodemographic and Clinical Characteristics of Study Participants (N=235)

Distribution of sociodemographic and clinical characteristics among 235 study participants. Data are presented as numbers of participants and percentages of the total (N=235) for each subgroup. Income is presented in Indian Rupees (₹).

Table *2* summarises the lifestyle factors, comorbidities, clinical parameters and diabetes distress levels among participants. According to the treatment regimens used, 66.8% were on oral hypoglycaemic agents (OHA), 19.1% on insulin and 14% on a combination of insulin and OHA. HbA1c levels showed 79.6% of participants were in the diabetic range, 17% pre-diabetic and only 3.4% within the normal range. Sedentary lifestyle was observed in 49.8%, while 12.3% had at least 30 minutes of daily activity. A total of 31.1% and 53.2% of participants were smokers and alcoholics, respectively. Among the comorbid conditions, hypertension at 18.7% and obesity at 8.5% were the most common. Common comorbidities included hypertension (18.7%), obesity (8.5%), cardiovascular disease (8.1%), ocular complications (7.7%), and diabetic foot ulcers (7.2%). While 36.2% reported no comorbid conditions. Height ranged mostly between 161 and 170 cm (41.3%) and weight between 66 and 75 kg (40.9%). Based on BMI, 62.1% of participants had normal weight (18.5-24.9), 34.5% were overweight (25-29.9), and 2.6% were obese (BMI >30). After total analysis, 77% had clinically significant diabetic distress. Among them, 23% experienced mild to no distress, 56.6% moderate distress and 20.4% severe distress. Emotional distress: Moderate distress was reported in 47.7%, and severe in 17%. Physician-related distress: 37.4% reported moderate distress, while 27.7% experienced severe distress. Regimen-related distress: 43% of participants had moderate distress, and 37.4% reported severe distress. Interpersonal distress: Severe interpersonal distress was observed in 38.7% of patients, followed by mild or no distress in 38.3%. Table *3* summarises the association between variables and levels of psychological distress among the participants. As shown in Table *4*, diabetes duration was the only factor significantly associated with diabetes-related distress in the adjusted analysis (p=0.001). Participants with a diabetes duration of 5-10 years had significantly higher odds of distress (adjusted odds ratio=9.687; 95% CI: 2.033-46.154; p=0.004). All other factors showed no statistically significant associations.

Variable		Frequency (%)
Smoking	Yes	73 (31.1%)
	No	162 (68.9%)
Physical activity per day	Sedentary lifestyle	117 (49.8%)
	1-15 minutes	43 (18.3%)
	16-30 minutes	46 (19.6%)
	31 minutes to 1 hour	29 (12.3%)
Alcohol consumption	Yes	125 (53.2%)
	No	110 (46.8%)
Associated comorbid conditions	Hypertension	44 (18.7%)
	Obesity	20 (8.5%)
	Severe hypoglycaemia	4 (1.7%)
	Chronic liver disease	13 (5.5%)
	Chronic renal disease	7 (3%)
	Tuberculosis	8 (3.4%)
	Cardiovascular	19 (8.1%)
	Ocular	18 (7.7%)
	Diabetic foot ulcer	17 (7.2%)
	None	85 (36.2%)
HbA1c	Normal	8 (3.4%)
	Pre-diabetic	40 (17%)
	Diabetic	187 (79.6%)
Treatment regimen	OHA	157 (66.8%)
	Insulin	45 (19.1%)
	Oral + insulin	33 (14%)
BMI	<18.5	2 (0.9%)
	18.5-24.9	146 (62.1%)
	25-29.9	81 (34.5%)
	>30	6 (2.6%)
Total distress	No or mild distress	54 (23.0%)
	Moderate distress	133 (56.6%)
	Severe distress	48 (20.4%)
Emotional distress	No or mild distress	83 (35.3%)
	Moderate distress	112 (47.7%)
	Severe distress	40 (17%)
Physician-related distress	No or mild distress	82 (34.9%)
	Moderate distress	88 (37.4%)
	Severe distress	65 (27.7%)
	No or mild distress	46 (19.6%)

Regimen-related distress	Moderate distress	101 (43%)
	Severe distress	88 (37.4%)
Interpersonal distress	No or mild distress	90 (38.3%)
	Moderate distress	54 (23%)
	Severe distress	91 (38.7%)

TABLE 2: Lifestyle Factors, Comorbidities, Clinical Parameters and Diabetes Distress Levels Among Participants (N=235)

Distribution of lifestyle factors, comorbidities, clinical parameters and diabetes distress levels among 235 participants. Frequencies and percentages are reported for each subgroup. Diabetes distress was categorised using a validated distress scale.

BMI, body mass index; HbA1c, glycated haemoglobin; OHA, oral hypoglycaemic agent.

Variable		No or mild distress	Moderate distress	Severe distress	Chi-square/p-value
Age	<45 years	9	28	11	1.0466/0.9026
	45-55 years	11	30	11	
	>55 years	34	75	26	
Gender	Male	31	84	28	0.694/0.707
	Female	23	49	20	
	Illiterate	0	3	0	
Education	Primary school	3	5	3	9.680/0.469
	High school	3	12	3	
	Intermediate	5	14	11	
	Graduate	24	60	18	
	Postgraduate	19	39	13	
Duration of diabetes	<5 years	31	50	17	18.016/0.006
	5-10 years	3	31	9	
	10-15 years	9	40	16	
	>15 years	11	12	6	
Family history	Yes	32	85	30	0.355/0.837
	No	22	48	18	
Smoking	Yes	16	44	13	0.660/0.719
	No	38	89	35	
Physical activity per day	Sedentary lifestyle	26	70	21	7.517/0.276
	1-15 minutes	10	24	9	
	16-30 minutes	9	29	8	
	31 minutes to 1 hour	9	10	10	
Alcohol consumption	Yes	24	78	23	3.785/0.151
	No	30	55	25	

Associated comorbid conditions	Hypertension	10	23	11	16.342/0.564
	Obesity	7	12	1	
	Severe hypoglycaemia	1	3	0	
	Chronic liver disease	3	6	4	
	Chronic renal disease	0	6	1	
	Tuberculosis	1	6	1	
	Cardiovascular	3	13	3	
	Retinopathy	2	11	5	
	Diabetic foot ulcer	7	7	3	
	None	20	46	19	
HbA1c	Normal	4	2	2	8.531/ 0.074
	Pre-diabetic	6	29	5	
	Diabetic	44	102	41	
Treatment regimen	Oral hypoglycaemic agents	33	91	33	2.025/ 0.731
	Insulin	12	26	7	
	Oral + insulin	9	16	8	

TABLE 3: Association Between Variables and Levels of Psychological Distress

Association between demographic, clinical and behavioural variables and levels of psychological distress among 235 participants. Distress levels are categorised as no/mild, moderate and severe based on standardised criteria. A chi-square test was used for statistical analysis; p-values are provided for each subgroup comparison, indicating the level of association between variables and psychological distress. $p<0.05$ was considered statistically significant.

HbA1c, glycated haemoglobin.

Variable	Reference category	Adjusted OR (95% CI)	p-value
Age (years)	>55 years reference		0.190*
	<45 years	2.470 (0.868-7.028)	0.090
	45-55 years	1.739 (0.714-4.238)	0.223
Gender	Male vs female	1.757 (0.722-4.272)	0.214
Duration of diabetes	>15 years reference		0.001*
	<5 years	0.777 (0.241-2.504)	0.673
	5-10 years	9.687 (2.033-46.154)	0.004
	10-15 years	3.162 (0.934-10.704)	0.064
Family history of diabetes	Yes/no	1.246 (0.620-2.507)	0.537
Smoking	Yes/no	0.381 (0.141-1.026)	0.056
Physical activity/day	Sedentary/active	1.738 (0.629-4.800)	0.286
Alcohol consumption	Yes/no	1.618 (0.676-3.873)	0.279
Associated comorbidities	No/Yes	1.243 (0.550-2.813)	0.601
Treatment regimen	Both		0.267*
	Oral hypoglycaemic drugs	1.689 (0.588-4.848)	0.330
	Insulin	0.794 (0.257-2.454)	0.689
Educational status	Graduate/postgraduate		0.661*
	Illiterate/primary school vs graduate/postgraduate	1.521 (0.331-6.997)	0.590
	High school/intermediate vs graduate/postgraduate	1.462 (0.574-3.724)	0.426

TABLE 4: Multivariable Binary Logistic Regression Analysis of Factors Associated With Diabetes-Related Distress Among Study Participants (N=235)

Diabetes duration was the only factor significantly associated with diabetes-related distress in the adjusted analysis (overall p=0.001). Participants with a diabetes duration of 5-10 years had significantly higher adjusted odds of moderate-to-severe distress than those with a duration of more than 15 years (AOR=9.687; 95% CI: 2.033-46.154; p=0.004). Age, gender, family history, lifestyle factors, comorbidities, treatment regimen and educational status showed no statistically significant associations with distress after adjustment.

OR, odds ratio.

Discussion

Diabetes distress is an emotional and psychological response to the burden of living and managing diabetes. It consists of feelings such as burnout, powerlessness, fear and frustration, which are closely linked to self-care demands, complications and interpersonal aspects of the illness [4]. Unlike clinical depression, diabetes distress is specific to diabetes and is associated with medication adherence, glycaemic control and overall quality of life [5,6]. Despite its clinical importance, diabetes distress still remains unrecognised, mostly in developing nations where psychological screening is not yet included in routine diabetic care. In this study of 235 individuals in India, 77% experienced clinically significant diabetes distress; 56.6% of them experienced moderate distress, and 20.4% reported severe distress. These results are congruent with other Indian studies, such as a hospital-based study from Eastern India, which reported diabetes distress of 77% (n=152) [12]. A study in rural Haryana found that 38% of adults showed moderate or high distress using the DDS-17 scale [13]. Another study based in Northeast India found a distress prevalence of 43% [14]. The higher rate in the current study may be related to broader inclusion criteria and the presence of complex treatment regimens and comorbidities.

In this study, regimen-related distress (37.4%) and interpersonal distress (38.7%) emerged as the most severe domains of diabetes-related distress. These findings are in line with those of Patra et al., who reported notably higher rates of regimen-related (70.4%) and interpersonal distress (63%) among patients with type 2 diabetes in Eastern India [15]. This research indicates that physician-related distress (27.7%) remains to be a

burden, showing gaps in healthcare communication, which is similar to findings from both Indian and global literature, which show the significance of empathy in reducing distress [16,17]. In this study, 75% of females and 78.3% of males were shown to have clinically significant diabetic distress. Unlike various other studies that found higher distress levels in females, this study suggests a slightly higher prevalence of distress among men, although both genders are shown to have high rates of distress. Kalra et al. and Mahala et al. highlighted the greater emotional burden among women due to factors such as caregiving roles, stigma and lack of psychosocial support [12,17]. This contrasting finding emphasises the critical differences between men and women, such as varying health-seeking behaviours, higher psychosocial support to women, or the higher external social expectations experienced by men. Males have a higher chance of facing internalised pressure to manage the condition independently, potentially associated with higher rates of distress. This current research indicates that the gender of the patient is of less significance, which shows the importance of individualised psychosocial screening within diabetes care.

Using the DDS-17 scale, this study found a significant association between diabetes duration and distress ($p<0.05$). Among participants with diabetes for over 10 years, 23.4% had severe distress compared with 17.3% who had diabetes for less than five years. This proves that the longer the duration of diabetes, the higher the levels of distress. These findings also align with other existing studies, such as Alwani et al. from Delhi [18]. Notably, 73.6% of participants in our study, despite being graduates and above, had high diabetic distress levels. This contrasts with the common assumption that education is known to reduce the number of instances of psychological distresses as brought to light by a study by Gahlan et al. in Rohtak, Haryana [19]. Other factors reported in previous studies to be associated with diabetes-related distress include sedentary lifestyles, poor glycaemic control, and comorbidities such as hypertension and cardiovascular conditions [7]. Overall, diabetes distress is a prevalent and challenging issue among the diabetic population in India. In our study, diabetes duration was significantly associated with distress, whereas no statistically significant associations were observed with HbA1c levels or comorbidities.

These particular findings emphasise the need to integrate routine psychological screening into diabetes care using the DDS-17. A review performed on interventions to treat diabetes distress showed the following techniques to be helpful: enhancing emotional support through effective listening and individualised one-on-one sessions for self-empowerment [20]. Recent researches looking into the use of technology-based conversational agents have proven to reduce diabetes distress and improve HRQoL [21,22].

Overall, this study highlights the high prevalence of diabetes-related distress and its association with diabetes duration. No statistically significant association was observed with glycaemic control. The high rates of distress observed in patients with diabetes signifies the need to focus more on the psychological aspect of the disease rather than just the clinical aspect such as glycaemic control. Utilising psychological assessment tools such as DDS-17 into routine care may significantly improve both the emotional well-being and the diabetes outcomes in patients.

Strengths

This study benefits from a clear sample size with a broad inclusion criteria, enabling the inclusion of patients from diverse backgrounds. Use of the DDS-17 scale allowed a standardised assessment. Face-to-face interviews using the local language allowed for an accurate and detailed assessment.

Limitations

Being a cross-sectional study, this research is unable to establish causal relationships. Data were collected from a single community, which may limit the generalisability of the findings to the broader diabetic population. Self-reported data may introduce recall and social desirability biases. The DDS-17 questionnaire was administered through verbal translation into Telugu, as an officially validated Telugu version was not available.

Conclusions

This study demonstrates a high prevalence of diabetes-related distress among Indian patients with type 2 diabetes, with 77% of participants experiencing clinically significant distress. Diabetes duration was significantly associated with diabetes-related distress, whereas HbA1c levels, comorbidities and treatment regimen were not statistically significantly associated with distress in the reported analysis. These findings highlight the importance of incorporating routine psychological screening into diabetes care using tools such as the DDS-17. This study reinforces the need to educate patients, guide healthcare providers and develop holistic healthcare programmes that prioritise emotional well-being alongside physical health to improve overall patient outcomes.

Additional Information

Author Contributions

All authors have reviewed the final version to be published and agreed to be accountable for all aspects of the work.

Concept and design: Abhinav Jayant Karajgi , B Nidhi Reddy Chepyala, Pidakala Mary Moses

Acquisition, analysis, or interpretation of data: Abhinav Jayant Karajgi , B Nidhi Reddy Chepyala, Pidakala Mary Moses

Drafting of the manuscript: Abhinav Jayant Karajgi , B Nidhi Reddy Chepyala, Pidakala Mary Moses

Critical review of the manuscript for important intellectual content: Abhinav Jayant Karajgi , B Nidhi Reddy Chepyala, Pidakala Mary Moses

Supervision: Abhinav Jayant Karajgi , B Nidhi Reddy Chepyala, Pidakala Mary Moses

Disclosures

Human subjects: Informed consent for treatment and open access publication was obtained or waived by all participants in this study. Institutional Ethics Committee - Mamata Academy of Medical Sciences issued approval IEC/MAMS/2025/178. **Animal subjects:** All authors have confirmed that this study did not involve animal subjects or tissue. **Conflicts of interest:** In compliance with the ICMJE uniform disclosure form, all authors declare the following: **Payment/services info:** All authors have declared that no financial support was received from any organization for the submitted work. **Financial relationships:** All authors have declared that they have no financial relationships at present or within the previous three years with any organizations that might have an interest in the submitted work. **Other relationships:** All authors have declared that there are no other relationships or activities that could appear to have influenced the submitted work.

Acknowledgements

Abhinav Jayant Karajgi and B Nidhi Reddy Chepyala contributed equally to this study and should be considered co-first authors.

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