

Original Research Article

Prevalence and association of various socio-clinical variables with diabetes distress in a rural diabetic population of Jammu District, India

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ABSTRACT

Background: Diabetes mellitus, a chronic metabolic disorder, affects both the physical and mental health of a diabetic patient. Diabetic distress includes feelings of worry, fear, guilt and frustration regarding the complexity and management of diabetes. The study aimed to assess the prevalence of diabetes distress and the association of socio-clinical variables with diabetes distress in rural diabetic patients.

Methods: This cross-sectional study was conducted among diabetic patients aged 20 years and above in the R.S. Pura block, which is a field practice area of the PG department of Community Medicine, Government Medical College Jammu. After collecting socio-demographic and clinical data, the diabetes distress scale (DDS-17) was administered to assess the diabetic distress among the participants. Chi-Square was the test of significance used.

Results: The prevalence of diabetes distress in this rural diabetic population was found to be 32.68%. Among the socio-demographic variables, gender, age, religion, literacy levels, family history of diabetes, etc., were significantly associated with diabetes distress ($p < 0.05$). The clinical variables significantly associated with diabetes distress were BMI, presence of co-morbidities, duration of diabetes and treatment modality ($p < 0.05$).

Conclusions: Almost one-third of this rural diabetic study population was suffering from diabetes distress, which clearly reflects that, irrespective of place of residence, diabetes distress is increasingly becoming a cause of concern. So, early screening of diabetic patients for distress is advised to take remedial steps at the incipient stages.

Keywords: Diabetes distress, Diabetes mellitus, Rural

INTRODUCTION

According to the INDIAB17 study, conducted nationwide, Diabetes mellitus (DM) is a growing challenge in India, as the current prevalence in India stands at 11.4%.¹ The number of the diabetic population is expected to increase to 124 million by 2045 due to the ageing population, economic development, increasing urbanization, sedentary lifestyles, and greater

consumption of unhealthy food.² Type 2 Diabetes Mellitus (T2DM) diagnosis puts a burden on the affected person to comply with specific lifestyle changes, give up some likes, be affected by the financial cost of care, and the social stigma of being diabetic. This can variably affect the person, leading to distress specific to the diabetic state. Diabetes distress (DD) has twin effect on health and psychology of the patient and generally results in poor health outcomes but also affects a patient's health

and is associated with poor health outcomes.³ Diabetes distress remains persistent over time and is found to be distinct from clinical depression.⁴ It is associated with fewer self-care behaviours, suboptimal glycaemic control, lower quality of life, and adverse disease outcomes. In a study conducted in Malaysia, authors reported that DD has a negative association with health-related QoL, and the association is more significant in diabetic patients who do not have supportive family or friends, as well as in patients with multiple comorbidities.⁵

Determining the prevalence of diabetes distress in the Indian population and its associated socio-clinical variables is crucial as it may help to develop novel treatments in the future. Review of literature reveals that few studies have been conducted to assess the prevalence of diabetes distress in the developed world and in India also but there is a paucity of data in Northern zone of our country with only limited studies conducted in North India; hence, this study was conducted to estimate the prevalence of Diabetes distress in patients with T2DM and to determine the various socio-clinical variables associated with Diabetes distress in the rural diabetic patients of Jammu district.

METHODS

This observational cross-sectional study was conducted at the General Medicine OPD in the Sub-district Hospital, R.S. Pura Block (field practice area of the Post Graduate department of Community Medicine, GMC Jammu) in Jammu District, Jammu and Kashmir, over two months from 15th of April till 14th of June, 2025, after seeking due permission from the Institutional Ethics Committee (IEC), Government Medical College, Jammu. The study population consisted of 250 patients with Type 2 Diabetes Mellitus, residing in the rural area of R.S. Pura, who attended the General Medicine OPD in the Sub-district Hospital, R.S. Pura, Jammu. Consecutive sampling method was used to recruit the subjects into the study to estimate the prevalence of Diabetes distress in patients with T2DM and to determine the various socio-clinical variables associated with Diabetes distress.

Inclusion criteria

Patients, aged 20 and above, with T2DM (disease diagnosis duration of >3 months), those who are willing to participate in the study were included.

Exclusion criteria

Patients having diabetes other than T2DM such as type-1 diabetes mellitus or gestational diabetes mellitus, patients with any known case of psychiatric illness, stage 4/5 chronic kidney disease or child pugh class-C chronic liver disease or cardiac ailment with severely reduced ejection fraction <30%, and those who are unwilling to participate in the study were excluded.

Study procedure

After obtaining approval from the IEC, GMC, Jammu, permission to conduct the study was sought from the Block Medical Officer, Sub-district Hospital R.S. Pura Block in Jammu District before commencing the study. The investigator used to visit the General Medicine OPD in Sub-district Hospital R.S. Pura, Jammu and each eligible participant, fulfilling the inclusion criteria, was explained in their local dialect by the investigator about the purpose of the study. The study subjects were assured that all the information gathered would be kept confidential. Thereafter, informed written consent was taken from the study subjects, and only those who consented to participate in the study were included in the study and interviewed, and data were collected. On average, 5 to 6 patients were interviewed daily during the study period. The interview was conducted following a predesigned, semi-structured study proforma containing information about various socio-demographic variables and clinical variables, which was followed by screening each eligible participant using the Diabetes Distress Scale-17 (DDS-17).⁶ Based on the DDS-17 scale, a score was assigned to the study subjects, and they were classified into little or no distress, moderate distress, and high distress.

Study tools

Questionnaire on socio-demographic and clinical variables

Diabetes Distress Scale-17⁶: DDS-17, developed by Polonsky et al., consists of 17 questions. It is used to measure diabetes distress among various domains: Emotional burden (5 items), Physician-related distress (4 items), Regimen-related distress (5 items), and Interpersonal distress (3 items). The response to each item is based on a 6-point Likert scale, rated from 1 (not a problem) to 6 (a very serious problem) concerning diabetes over the past one month; thus, higher values indicate greater distress. Based on the mean item score, the patients are classified into 3 groups: (i) Little or no distress (Score <2), (ii) Moderate distress (Score 2 to 2.9), (iii) High distress (Score > 3).

Statistical analysis

The data collected were entered into a Microsoft Excel sheet and analyzed using SPSS, version 27.0. The association of socio-clinical variables with Diabetes distress was evaluated and its statistical significance was assessed using chi-square. A p-value of < 0.05 was taken as significant, and all p-values reported were two-tailed.

RESULTS

The study population consisted of 250 diabetic rural adults, and the majority (55.20%) were males. Slightly more than half (50.4%) of the respondents were in the 41-

60 year age group, and Hinduism was the predominant religion. Almost 60% of the respondents had a literacy level at higher secondary or above, and one-third belonged to the service class based on their occupation. A family history of diabetes was present in 42%

respondents. Two-thirds of respondents had a BMI in the normal range, 52 % had the presence of co-morbid conditions, and almost 60 % had >5 years duration of disease (T2DM). The majority (84 %) of them were on oral hypoglycemic agents (Table 1).

Table 1: Distribution of socio-demographic and clinical variables in the study subjects.

Variables	Frequency (n=250)	Percentage (%)
Gender		
Male	138	55.20
Female	112	44.80
Age (years)		
<40	44	17.60
41-60	126	50.40
>61	80	32.00
Religion		
Hindu	182	72.80
Muslim	38	15.20
Sikhs	30	12.00
Literacy levels		
Illiterate	32	12.80
Middle school	72	28.80
Higher secondary	98	39.20
Graduate and above	48	19.20
Occupation		
Homemaker	98	39.20
Self employed	52	20.80
Service class	82	32.80
Retired	18	07.20
Marital status		
Married	232	92.80
Unmarried	18	07.20
Family history of diabetes		
Present	105	42.00
Absent	145	58.00
BMI (kg/m²)		
<18.5	12	04.80
18.5-24.99	168	67.20
25-29.99	53	21.20
>30	17	06.80
Smoking status		
Yes	82	32.80
No	168	67.20
Co-morbidities		
Yes	155	62.00
No	95	38.00
Duration of diabetes		
<5 years	102	40.80
> 5 years	148	59.20
Treatment modality		
Oral	212	84.80
Insulin	12	04.80
Oral + Insulin	26	10.40

Table 2: Distribution of diabetes distress domains based on gender.

	Emotional burden			Physician-related distress			Regime-related distress			Interpersonal distress		
	Mild N (%)	Mod. N (%)	Severe N (%)	Mild N (%)	Mod. N (%)	Severe N (%)	Mild N (%)	Mod. N (%)	Severe N (%)	Mild N (%)	Mod. N (%)	Severe N (%)
Male	108 (63.53)	24 (46.15)	06 (21.43)	96 (50)	34 (70.83)	08 (80)	104 (53.06)	30 (71.43)	04 (33.33)	130 (56.03)	06 (50)	02 (33.33)
Female	62 (36.47)	28 (53.85)	22 (78.57)	96 (50)	14 (29.17)	02 (20)	92 (46.94)	12 (28.57)	08 (66.66)	102 (43.97)	06 (50)	04 (66.66)
Total	170	52	28	192	48	10	196	42	12	232	12	06

Table 3: Association of diabetes distress with socio-demographic and clinical variables.

Variables	Total, N	Mild distress N (%)	Moderate distress N (%)	Severe distress N (%)	P value
Gender					
Male	138	96 (69.56)	30 (21.74)	12 (8.70)	<0.0001
Female	112	72 (64.29)	13 (11.61)	27 (24.10)	
Age in years					
<40	44	38 (86.36)	04 (9.10)	02 (4.55)	<0.001
41-60	126	100 (79.36)	21 (16.67)	05 (3.97)	
>61	80	30 (37.5)	18 (22.5)	32 (40)	
Religion					
Hindu	182	140 (76.92)	22 (12.09)	20 (10.99)	<0.0001
Muslim	38	09 (23.68)	16 (42.11)	13 (34.21)	
Sikhs	30	19 (63.33)	05 (16.66)	06 (20)	
Literacy levels					
Illiterate	32	16 (50)	08 (25)	08 (25)	0.0003
Middle	72	50 (69.45)	06 (8.33)	16 (22.22)	
Higher secondary	98	78 (79.59)	16 (16.33)	04 (4.08)	
Graduate and above	48	24 (50)	13 (27.08)	11 (22.92)	
Occupation					
Homemaker	98	66 (67.35)	23 (23.47)	09 (9.18)	<0.0001
Self employed	52	40 (76.93)	04 (7.69)	08 (15.38)	
Service class	82	60 (73.17)	10 (12.20)	12 (14.63)	
Retired	18	02 (11.11)	6 (33.33)	10(55.56)	
Marital status					
Married	232	158 (68.10)	40 (17.24)	34 (14.66)	0.32
Unmarried	18	10 (55.55)	03 (16.67)	05 (27.78)	
Family history of diabetes					
Present	105	48 (45.71)	33 (31.43)	24 (22.86)	<0.0001
Absent	145	120 (82.76)	10 (6.90)	15 (10.34)	
BMI					
<18.5	12	08 (66.66)	02 (16.67)	02 (16.67)	<0.0001
18.5-24.99	168	142 (84.52)	13 (7.74)	13 (7.74)	
25-29.99	53	15 (28.30)	22 (41.51)	16 (30.19)	
>30	17	03 (17.65)	06 (35.29)	08 (47.06)	
Smoking status					
Yes	82	51 (62.19)	18 (21.96)	13 (15.85)	0.35
No	168	117 (69.64)	25 (14.88)	26 (15.48)	
Co morbidities					
Yes	160	93 (58.12)	31 (19.37)	36 (22.5)	0.001
No	90	70 (77.78)	12 (13.33)	08 (8.89)	

Continued.

Variables	Total, N	Mild distress N (%)	Moderate distress N (%)	Severe distress N (%)	P value
Duration of diabetes					
<5 years	102	83 (81.37)	12 (11.77)	07 (6.86)	0.0002
>5 years	148	85 (57.43)	31 (20.95)	32 (21.62)	
Treatment modality					
Oral	195	156 (80)	24 (12.31)	15 (7.69)	<0.00001
Insulin	16	02 (12.5)	06 (37.5)	08 (50)	
Oral and insulin	39	10 (25.64)	13 (33.33)	16 (41.03)	

The prevalence of diabetes distress in this rural diabetic population was found to be 32.68% with mild distress seen in 67.2%, moderate distress in 17.2% and severe distress in 15.6%. The gender-based distribution of distress domains revealed that emotional distress was more prevalent in female patients, while physician-related and regimen-related distress was predominant in male patients. As far as interpersonal distress was concerned, it was slightly higher in female participants than in their male counterparts. Details are presented in Table 2.

The socio-demographic variables like gender, age, religion, literacy level, occupation, and family history of diabetes were significantly associated with diabetes distress ($p<0.05$). Among the clinical variables, BMI, presence of co-morbidities, duration of diabetes, and treatment modality were found to be significantly associated with diabetes distress. Details are presented in Table 3.

DISCUSSION

Among the many complications of diabetes, diabetes distress has caught the attention of researchers of late. The condition is sometimes mistaken as depression due to the overlapping nature of both these entities. Hence, it becomes important for physicians to conduct mental health assessments of diabetic patients to rule out depression.

The results of the present study revealed that the prevalence of diabetes distress was 32.8% among the participants. The results are in agreement with those reported in a systematic review and meta-analysis using established cut-off scores in T2DM patients.⁷ Higher prevalence rates of 37%, 42% and 58% have been reported in other Indian studies.⁸⁻¹⁰ In contrast, a lower prevalence rate of 17.69% was reported in a study conducted in study conducted in suburban Mumbai by Purushottaman et al.¹¹ Although the present study was conducted in a rural population, the higher levels of diabetic distress prevalence clearly reflect that people in hinterlands are also undoing the zone of epidemiological transition.

The analysis of the results in the present study showed that among the socio-demographic variables, gender, age, religion, literacy levels, occupation, and family history of diabetes were found to be significantly associated with

diabetes distress ($p<0.05$). In contrast, Purushottaman et al.¹¹ found no significant association of diabetic distress with variables like religion, marital status, education and occupation. Previous studies have stated high levels of distress among illiterates but no significant association was found with the rest of the socio-demographic variables.^{10,12} Illiteracy leads to poor knowledge about the disease, with resultant poor medication compliance and non-adherence to follow-up visits.

Among the clinical variables, BMI, presence of co-morbidities, duration of diabetes, and treatment modality were found to be significantly associated with diabetic distress ($p<0.05$). In this context, Purushottaman et al noted that smoking status, treatment modality, hypothyroidism and hypertension were significantly associated with diabetic distress.¹¹ Another Indian study from south India noted that diabetic distress was high among patients on insulin, smokers, those with shorter duration of disease and with glycemic control.¹²

The present results also elucidated that emotional distress was more prevalent among female diabetics, while physician-related and regimen-related distress was more prevalent among male diabetics. These results are consistent with those reported by Aliuaid et al and Hemavathi et al.^{13,14} Few authors have reported that the use of technology-based conversational agents reduces diabetic distress and improves health-related quality of life.¹⁵⁻¹⁷

This study has few limitations. Small sample size, a single centre study and cross-sectional design are among the limitations of this study.

CONCLUSION

The results have shown high levels of diabetic distress (32.8%) in rural diabetic patients, which is indeed a cause for concern. The role of counseling to manage distress among diabetic patients cannot be overemphasized. Further research to identify the burden and predictors of diabetes distress is the need of the hour.

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Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee of Government Medical College, Jammu, J&K, India

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