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Original Research Article

Prevalence of diabetes distress and its psychosocial determinants among Indian population with type II diabetes

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ABSTRACT

Background: Diabetes distress (DD) refers to the negative emotional or affective experience resulting from the challenge of living with the demands of diabetes, regardless of the type of diabetes. In addition to the chronic treatment of diabetes, patients with type 2 diabetes mellitus (T2DM) often experience psychosocial difficulties which can go unnoticed. Hence, it is necessary to identify DD at an early stage to prevent its effect on the patients' long-term self-care and management plan. This study was conducted to assess the prevalence of DD and its psychosocial determinants among T2DM at a tertiary care centre.
Methods: This was a cross sectional, observational study which included patients of either gender, who were between 18-65 years of age with T2DM for more than 3 months to 12 years. DD was assessed using the diabetes distress scale (DDS17) scale. In addition, association between the level of DD with the sociodemographic and clinical characteristics of the patients was assessed.
Results: The prevalence of DD in type II diabetic patients in suburban population was found to be 17.69%. The psychosocial determinants which influence DD were found to be age, treatment modality, hypothyroidism, hypertension, and smoking.
Conclusions: This study signifies the importance of identifying DD by the primary care physician which often remain unrecognized in clinical practice and to implement the interventions at early stages to improve the quality of life of diabetic patients.

Keywords: Type II diabetes mellitus, Diabetes distress, DDS17 scale, Depression

INTRODUCTION

Diabetes mellitus (DM) is a growing challenge in India as current prevalence in India stands at 11.4% as per the recent nationwide ICMR-INDIAB17 study published in Lancet.[1] The number of 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]

T2DM diagnosis puts a burden on affected person to comply with specific lifestyle, give up some likes, being affected by financial cost of care and the social stigma of being diabetic. And this can variably affect the person leading to distress specific to diabetic state.[6] DD was a term first coined by a group of psychiatrists and psychologists in Joslin Diabetes Centre in 1955 referring to the psychosocial challenges faced by the people living with diabetes. It refers to the unique and hidden emotional burdens that are part of the spectrum of the patient

experiences, when managing a severe, demanding chronic disease like diabetes.[3] DD 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.

DD is mainly an effective response to diabetes which includes the feeling of worry, fear, guilt and frustration regarding the complexity and management of diabetes specifically. In contrast, depression involves a broad range of other reactions different from the affective response and includes cognitive, affective, social, motivational, vegetative, and interpersonal disturbances, not focused specifically to any disease.[5] Patients of diabetes mellitus experience psychological difficulties which often remain unrecognized.[6] Hence, identifying and supporting such patients with psychosocial problems in early stages of diabetes is important as it may affect their ability to adjust or take adequate responsibility for self-care in long term treatment plan.

DDS17 scale is one such scale which is used to assess diabetes-related distress serving as a valuable measure for use in research and clinical practice. It is a 17-item scale developed by Polonsky et al based on four distress-related domains: emotional burden, physician-related distress, regimen-related distress, and diabetes-related interpersonal distress.[7,8]

It is important to determine the burden of DD in Indian population and determine its psychosocial determinants which could also lead to developing new interventions in future. Few studies have been carried out in India to assess the prevalence of DD.[9-13] with only limited studies conducted in Western parts of India.[15]

Hence, this study was designed to collect more robust data to assess the prevalence of DD in Western India population with type II diabetes mellitus and assess the psychosocial determinants of DD.

METHODS

This observational, cross-sectional study was conducted at outpatient department in Bhaktivedanta Hospital and Research institute in suburban Mumbai over a period of 23 months from August 2019 to June 2021 after obtaining approval from the institutional ethics committee of the hospital. A total of 130 consecutive consenting people with T2DM were enrolled in the study which included participants of all genders and within age group of 18 to 65 years who had type II diabetes mellitus between 3 months to 12 years. Patients having diabetes other than type II diabetes mellitus such as type I diabetes mellitus or gestational diabetes mellitus, patients with any known case of psychiatric illness, patients having severe comorbidities like stage 4-5 chronic kidney disease or Child Pugh class-C chronic liver disease or cardiac ailment with severely reduced ejection fraction < 30% were excluded.

Eligible patients were explained about the study in detail in their language and a written informed consent was obtained. They were surveyed using a self-administered questionnaire known as DDS-17 scale (DD scale). It consists of 17 questions with each response recorded in a 6-point Linkert scale grading and used to measure DD among various domains: emotional burden, physician-related distress, regimen-related distress, interpersonal distress. Study subjects with a total score of <2.0 were considered to have little or no distress, those with a score between 2.0 and 2.9 were considered to have moderate distress, and those with ≥3.0 were considered to have high distress. Information such as height, weight, treatment modality, comorbidities, laboratory investigations like HbA1C and other data from medical records were also obtained. The numeric data and categorical data were summarized by descriptive statistics like, n, mean, frequency count and percentage. Normality test was performed before applying any statistical test. A p value less than 0.05 was considered statistically significance.

RESULTS

There were a total of 130 participants in the study, out of which 53.08% (n=69) patients were male, while 46.92% (n=61) patients were female. The mean age of the patients in this study was 53.72 years. The socio-demographic and clinical parameters of the study participants are as shown in Table 1.

Out of the total 130 patients included in the study, the prevalence of patients with DD using the DDS17 scale was 17.69% (n=23). Out of 130 patients, 82.30% (n=107) had mild distress, 14.61% (n=19) patients had moderate distress and 3.07% (n=4) patients had severe distress. In our study, there was no significant influence of gender on the total distress (p=0.858), including the four distress-related domains like emotional burden (p=0.139), physician distress (p=0.828), regimen distress(p=0.327), and interpersonal distress(p=0.584) using DDS17 scale. However, there was a significant influence of age on the total distress (p=0.0003), emotional distress (p=0.046) and regimen distress (p=0.014) using the DDS17 scale as depicted in Table 2.

Among the sociodemographic characteristics of the patients, we found no significant influence of religion, marital status, education and occupation on the level of distress (p>0.05). However, we found a significant influence of the treatment modality (p=0.02), smoking status (p=0.036), hypothyroidism (p=0.022) and hypertension (p=0.018) on the level of distress as shown in Table 3.

Table 1: Sociodemographic and clinical parameters of the study participants.

Variables	Frequency (n)	Percentage
Gender		
Male	69	53.08
Female	61	46.92
Age (years)		
<40	20	15.40
41-50	26	20.00
51-60	36	27.70
>61	48	36.90
Religion		
Hindu	109	83.84
Muslim	14	10.76
Christian	7	05.38
Marital status		
Married	126	96.92
Unmarried	4	03.07
Education		
Middle school	3	02.30
High school	14	10.76
Intermediate	20	15.38
Graduate	49	37.69
Postgraduate	27	20.76
Professional	17	13.07
Occupation		
Employed	52	40.00
Retired	18	13.84
Homemaker	44	33.84
Unemployed	16	12.30
Body mass index (kg/m^2)		
<18.5	2	01.53
18.5-24.9	57	43.84
25-29.9	47	36.15
>30	24	18.46
Smoking status		
Smoker	34	26.15
Non-smoker	96	73.84
Comorbidities		
Hypertension	62	47.69
Ischemic heart disease	12	09.23
Hypothyroidism	13	10.00
Chronic kidney disease	10	07.69
None	33	25.38
Duration of diabetes (years)		
>10	108	83.07
<10	22	16.92
Treatment modality		
OHA (oral hypoglycemic agent)	102	78.46
OHA+ insulin	28	21.53
Level of glycaemic control (HbA1C level)		
<7	51	39.23
7 to 8	34	26.15
>8	45	34.61

Table 2: Age and gender wise distribution of DD by DDS17 scale.

Varia-bles	Total distress			Emotional distress			Physician related distress			Regimen related distress			Interpersonal related distress		
Gender wise distribution of domains of DD by DDS17 scale															
Gend-er	**Mi-ld**	**Mod-erate**	**Sev-ere**	**Mi-ld**	**Mod-erate**	**Sev-ere**	**Mi-ld**	**Mod-erate**	**Sev-ere**	**Mi-ld**	**Mod-erate**	**Sev-ere**	**Mi-ld**	**Mod-erate**	**Sev-ere**
Fe-male	49	10	2	30	20	11	54	6	1	47	10	4	56	2	3
Male	58	9	2	45	18	6	60	6	3	49	18	2	65	3	1
Total	107	19	4	75	38	17	114	12	4	96	28	6	121	5	4
P value	0.858			0.139			0.828			0.327			0.584		
Age wise distribution of domains of DD by DDS17 scale (years)															
<40	11	8	1	8	6	6	17	3	0	11	8	1	18	1	1
41-50	18	6	2	15	7	4	20	3	3	15	8	3	23	1	2
51-60	32	3	1	19	11	6	32	3	1	29	5	2	32	3	1
>60	46	2	0	33	14	1	45	3	0	41	7	0	48	0	0
P value	0.0003*			0.046*			0.168			0.014*			0.085		

*Statistically significant

Table 3: Association of sociodemographic and clinical variables with total DD by DDS17 scale.

Variables	Mild	Moderate	Severe	P value
Religion				
Hindu	87	19	3	0.121
Muslim	14	0	0	
Christian	6	0	1	
Marital status				
Married	105	17	4	0.21
Unmarried	2	2	0	
Education				
Middle school	3	0	0	0.156
High school	12	2	0	
Intermediate	18	2	0	
Graduate	43	5	1	
Post graduate	21	6	0	
Professional	10	4	3	
Occupation				
Employed	39	10	3	0.35
Retired	18	0	0	
Homemaker	36	7	1	
Unemployed	14	2	0	
Duration of diabetes (years)				
<10	86	18	4	0.3
>10	21	1	0	
Treatment modality				
OHA	88	13	1	0.02*
OHA+Insulin	19	6	3	
Smoking status				
Smoker	24	7	3	0.036*
Non smoker	83	12	1	
Body mass index (BMI)				
<18.5	1	1	0	0.529
18.5-24.9	50	1	0	

Continued.

Variables	Mild	Moderate	Severe	P value
25-29.9	36	4	1	
>30	20	4	0	
Level of glycemic control (HbA1C level)				
<7	46	4	1	0.159
7 to 8	27	7	0	
>8	34	8	3	
Hypothyroidism				
Present	11	0	2	0.022*
Absent	96	19	2	
Chronic kidney disease				
Present	9	1	0	1
Absent	98	18	4	
Hypertension				
Present	55	4	3	0.018*
Absent	52	15	1	
Ischemic heart disease				
Present	11	1	0	0.792
Absent	96	18	4	

*Statistically significant

DISCUSSION

Even though there are many known complications of diabetes, DD is a relatively new concept being researched in the past few decades.[3] Over the years, there has been an increase in research on DD, yet it is important to distinguish it from clinical depression as DD can be misdiagnosed as depression.[4] Depression is a generic feeling of depressed affect which is not specific to any disease. DD implies the feeling of guilt, fear or worry specifically due to the chronic nature of diabetes mellitus. DD is content related where different sources of distress can be recognized, and specific interventions can be initiated.[5] Hence, due to their overlapping nature, it is necessary that healthcare professions conduct mental health assessments in clinical practice to rule out depression and screen DD in all diabetics to prevent any further complications. In our study, the prevalence of DD by DDS17 scale was found to be 17.69%. Other Indian studies had prevalence of DD as 58%, 37% and 42% respectively.[9-11] A systematic review and meta-analysis on DD showed that the overall prevalence of DD using established cut-off scores in people with Type 2 diabetes was 36%.[17]

In our study, we found no significant influence of gender on the total distress using DDS17 including the four distress-related domains (emotional burden, physician distress, regimen distress, and interpersonal distress) ($p>0.05$) which was congruent with the findings of a similar study done in suburban Mumbai.[15] However, few cross-sectional studies in South India as well as a meta-analysis showed that DD was associated with gender, particularly women.[9,12,17]

Using the DDS17 scale we found a significant influence of age on the total distress, emotional burden and regimen distress ($p<0.05$). Another study from South India found that as age increases, DD decreases which could be due to the gradual adjustment of the diabetic lifestyle causing reduced distress over the years.[12] Emotional distress maybe due to the feeling of being overwhelmed by living life with diabetes, whereas regimen related distress might be related to feeling incompetent to check blood sugar regularly. It is proven that type 2 diabetes mellitus patients report more regimen-related distress whereas type 1 diabetes mellitus patients report concerns about the burnout and hypoglycemia events. Both types of patients worry about the future complications of diabetes especially in young patients that have been diagnosed recently.[17]

Amongst the sociodemographic characteristics of the patients, we found no significant influence of religion, marital status, education, and occupation on the level of distress using DDS17 scale ($p>0.05$). There are few studies which state that level of distress is high among the illiterates, but no significant association was found with other sociodemographic characteristics.[9,11,13] Among the clinical characteristics of the patients there was a significant influence of the treatment modality, smoking status, hypothyroidism, and hypertension on the level of distress ($p<0.05$). Similarly, a cross sectional study in South India also found DD to be high among patients on insulin, smokers, and those with shorter duration of disease.[13] There was no significant influence of HbA1c level with DD in our study. Similar findings were reported in another study conducted in 700 Asian type 2 DM patients wherein HbA1c and DD had no significant relation.[25] In contrast, findings of a few studies showcased significant association of distress with glycemic control.[13,14] The association of DD with comorbidities such as hypothyroidism and hypertension were not seen in any other Indian studies.[9-13]

The knowledge of the higher prevalence of DD in India necessitates the need for the primary care physicians to assess and identify DD amongst the patients in the early stage using DDS17 scale in their clinical practice. Implementing validated screening instruments or diabetes self-management education in their practice can help clinicians to address the mental health needs of their patients.[18] A systemic review done on interventions to treat the DD demonstrated following techniques to be beneficial: enhancing emotional support (through effective listening and responding), individualized 1:1 motivational interviewing and empowerment, behavioral empathy demonstrated through acknowledgement and pursuit.[19] The patients can be introduced to websites dedicated for diabetes or even self-help books.[20,21] Recently there are few studies exploring the use of technology-based-conversational agents which have proven to reduce DD and improve health related quality of life.[22-24]

Limitations

This study was a single center study performed in a tertiary care center in suburban Mumbai. Hence the study population might not be representative of the general population. A larger sample size from a heterogenous population could have been more reliable. Due to the cross-sectional nature of the study, the long term effects of DD on monitoring, treatment and outcome of diabetes could not be assessed.

CONCLUSION

The findings of our study suggested that DD is a significant health issue that affects people with type 2 diabetes in India. Through the knowledge and understanding of prevalence of DD in patients with diabetes, clinicians will be able to adjust the choice of treatment modality accordingly and additionally, patient counselling can be done to manage distress caused by diabetes. Understanding more about DD with the help of DDS-17 scale will enable the treating doctor to address the diabetic stress factors which in turn would help in managing diabetes better. Further long-term studies are required to evaluate additional factors which influence DD in Indian population.

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