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A cross-sectional study on Diabetes Distress among Type II Diabetes patients attending a Diabetes and Nutrition clinic in a Tertiary Government Hospital, Tripura, India

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ABSTRACT

Background

Prevalence of diabetes is rapidly increasing worldwide and due to its chronicity, it poses a significant psychological burden on the patients, in the form of diabetes distress. However, this distress can be prevented by approaching it with early detection and proper counseling. The present study aims to find out the proportion of distress among diabetes patients, attending the Diabetes and Nutrition Clinics of Agartala Government Medical College, in Tripura.

Materials & methods

This descriptive cross-sectional hospital-based study was conducted in West Tripura district during the year 2018-2020, including a total of 300 diabetics. Diabetes Distress Scale-17 was used to assess the distress. Data was analysed in statistical package for social sciences (SPSS) version 21.0.

Results

In the present study, mean age of the study participants was 53.48 years(± SD 10.33 years). 55% of the subjects were female, 57.67% were from urban areas, 80.33% married, 48.33% housewives, 27% were illiterate, and 30.67% were from middle socio-economic status (SES).The proportion of high, moderate and little or no diabetes related distress among the subjects were 17.33%, 40.34% & 42.33% respectively. The factors significantly associated with moderate to high diabetes distress were sex (female, p= 0.003) community (Other Backward Classes, p= 0.023), education (illiterates, p= 0.003), occupation (housewives, p=0.000) and marital status (married, p= 0.019). On multiple regression analysis only occupation (housewives, p=0.005) was found to have significant effect.

Conclusion: This study indicates the need for routine screening and timely diagnosis of diabetes distress so that psychological counseling can be effective.

Keywords: Diabetes Distress, DDS-17, Type II diabetes.

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INTRODUCTION

World Health Organisation has defined diabetes as a state of chronic hyperglycemia resulting from decrease in insulin production (type I) or decreased insulin uptake by cells (type II) leading to a multitude of complications, ranging from disease of the small vessels of the kidney and retina, peripheral neuropathy, and coronary artery disease.[1] It is one of the most important public health concerns.[2] The prevalence of diabetes is increasing rapidly worldwide and thus it is anticipated to be the 7th leading cause of death by 2030.[3,4]Due to the notorious nature of chronicity, diabetes poses a significant physical as well as psychological burden on the patient. Diabetes distress (DD) can be defined as an affective disorder, a syndrome comprised of a multidimensional component, such as worry, conflict, frustration, and discouragement that can accompany living with diabetes.[5] Symptoms of DD include feeling mentally and physically drained as well as changes in an individual's problem- solving skills. This could lead to inadequate diabetic self-care practices which could ultimately lead to poorer glycemic control. [6] 1 out of 5 people with type II DM suffer from high diabetes distress.[7,8]The Diabetes Distress Scale (DDS) measures this distress as well as four distinct dimensions of distress: 1) emotional burden, 2) physician-related distress, 3) regimen-related distress and 4) interpersonal distress. The emotional burden involves the negative mental and emotional aspects of living with diabetes. This may include feeling negative emotions like despair, conflict or fear- induced anger that result from feeling overwhelmed by demands of diabetes. Physician-related distress includes concerns about access to health care and quality of care received, including concerns whether recommendations provided by health care professionals are complete and appropriate enough. Thirdly, regimen related distress involves concerns and discouragement that patients perceive and/or encounter while self-managing their disease. Finally, there is interpersonal distress, usually resulting from day-to-day interactions with close or significant people in a patient's life, or the lack thereof. This interpersonal distress can often limit emotional support which makes it more difficult to maintain a healthy lifestyle, thus contributing to diabetes distress.[5,9,10]Diabetes distress is preventable with early detection and proper counseling, formulation and implementation of remedial measures, thereby improving diabetes self-care and decreasing the multi-morbidities of diabetes, both physical as well as psychological.[11] This in turn would also reduce the burden on families living with a diabetic, and the overall public health burden. Thus, this study was conducted to find out the proportion of distress among type II diabetic patients attending a Diabetes and Nutrition Clinic in Agartala Government Medical College and Govind Ballabh Pant Hospital (AGMC and GBPH), and to assess the factors associated with distress.

Materials and Methods

This is a hospital based cross sectional study conducted in the Diabetes and Nutrition clinic in Agartala Government Medical College, West Tripura, from 1st May 2019 to 31st October 2020, for a duration of eighteen months. Known cases of type II diabetics attending the clinic who are more than 18 years old and under treatment for at least 6 months were included whereas, those who required immediate admission and who did not provide consent for the study, were xcluded. The sample size has been calculated using the following formula for calculating sample size in observational studies measuring proportions, $n = [(Z_{1-\alpha/2})^2 PQ\} \div l^2]$,[12] considering the proportion of diabetes distress is 24.8% (P)[13], at 5% level of significance. An absolute error of 5% was considered and thus the sample size of 300 (rounded up) was calculated. Considering that minimum 30 patients could come to the Nutrition and Diabetes clinic (an out-patient department), AGMC & GBPH, every working day, as evident from past years' records, on each day of data collection, the 3 numbers ≤ 30 were chosen freshly from the random number table, and then recruited as study subjects by enrolling with those serial numbers on that day(registration number on day-basis), keeping the inclusion and exclusion criteria in mind. Written informed consent for participation in this study was obtained from the participants. Data was collected through a face to face interview with a pre-designed, pretested, structured interview schedule which consists of 2 parts, namely; socio-demographic characteristics and the diabetes distress scale[9].The diabetic distress was measured by the Diabetes Distress scale[9,14] consisting of 17 items where each item response was recorded using a 6-point scale.

The patients' responses to the items were added and then divided by 17 for the distress score. Participants 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 ≥3.0 were considered to have high distress. The socio-economic classification of the respondents has been done according to the modified BG Prasad scale (2018), which uses per capita monthly income to determine the socio-economic classes and can be applied for individuals from both urban and rural areas [15]. The collected data is compiled and analyzed using Statistical Package for Social Sciences (SPSS) version 21.0. Descriptive statistics such as percentage, mean and standard deviation were calculated for the quantitative data. Inferential statistics like Chi-square test and Fisher's exact test were applied to study the association between qualitative variables. P value < 0.05 will be considered as significant. The Institutional Ethics Committee of Agartala Government Medical College has approved this study, and confidentiality was maintained throughout the process of data management.

Table-1 Diabetes Distress in subjects by their socio-demographic factors (n=300)

Characteristics		Little or no distress	High to Moderate distress	χ^2 value	p-value
Age	Less than 40 years	7 (28%)	18(72%)	3.990	0.263
	40-49 years	30(40.54%)	44(59.46%)		
	50-59 years	51(48.57%)	54(51.43%)		
	60 years and above	39(40.63%)	57(59.37%)		
Sex	Male	70(51.85%)	65(48.15%)	9.110	**0.003**
	Female	57(34.55%)	108 (65.45%)		
Religion	Hindu	122(42.51%)	165 (57.49%)	0.083	0.773
	Muslim	5(38.46%)	8(61.54%)		
	General	54(49.09%)	56(50.91)		
Community	SC	32(34.41%)	61(65.59%)	9.574	**0.023**
	ST	7(77.78%)	2(22.22%)		
	OBC	34(38.64%)	54(61.36%)		
Education	Illiterate	22(26.19%)	62(73.81%)	13.723	**0.003**
	Primary	53(50.48%)	52(49.52%)		
	Secondary	42(49.41%)	43(50.59%)		
	Graduate & above	10(38.46%)	16(61.54%)		
Marital Status	Married	110(45.64%)	131 (54.36%)	5.499	**0.019**
	Single/separated/ widow	17(28.81%)	42 (71.19%)		
	Housewife	44 (30.99)	98 (69.01%)		

Occupation	Working	62 (50%)	62 (50%)	15.734	**0.000**
	Not Working	21 (61.76%)	13 (38.24%)		
Residence	Rural	46(36.22%)	81(63.78%)	3.371	0.066
	Urban	81(46.82%)	92(53.18%)		
Type of family	Nuclear	93(42.08%)	128(57.92%)	0.022	0.883
	Joint	34(43.04%)	45(56.96%)		
Characteristics		Little or no distress	High to Moderate distress	χ^2 value	p-value
Socio-economic status	Upper Class	25(43.86%)	32(56.14%)	8.662	0.070
	Upper Middle class	24(51.06%)	23(48.94%)		
	Middle Class	43(46.74%)	49(53.26%)		
	Lower Middle Class	31(38.27%)	50(61.73%)		
	Lower Class	4(17.39%)	19 (82.61%)		
Diet	Vegetarian	10(40%)	15 (60%)	0.061	0.805
	Non vegetarian	117 (42.55%)	158(57.45%)		
Smoking	Smokers	51(56.04%)	40 (43.96%)	10.058	**0.002**
	Non-Smokers	76(36.36%)	133(63.64%)		
Alcohol consumption	Those who consume alcohol	47(58.75%)	33(41.25%)	12.043	**0.001**
	Those who do not consume alcohol	80(36.36)	140(63.64%)		
Tobacco Chewing	Yes	57 (42.22%)	78(57.78%)	0.001	0.972
	No	70(42.42%)	95(57.58%)		
Hypertension	Hypertensive	55(46.22%)	64 (53.78%)	1.220	0.269
	Normotensive	72 (39.78%)	109(60.22%)		
Family history of Diabetes	Present	21 (55.26%)	17 (44.74%)	2.980	0.084
	Absent	106 (40.46%)	156 (59.54%)		
Duration of Diabetes	Less than 10 years	72 (39.34%)	111 (60.66%)	1.717	0.190
	10 years or more	55 (47.01%)	62 (52.99%)		

Current treatment for Diabetes	OHA	73 (39.67%)	111 (60.33%)		
	Insulin	38 (50.67%)	37 (49.33%)	2.850	0.240
	Both OHA and Insulin	16 (39.02%)	25 (60.98%)		

Results

Out of 300 type II diabetics included in the study, the majority (35%) belonged to the age group of 50-59 years and the mean age of the study participants was 53.38 years (±SD: 10.33years). 55% of the subjects were female. Majority of the participants, 95.67% were Hindu, 36.37% belonged to general caste, 57.67% were from an urban area, 80.33% were married (80.33%), 47.33% were housewives, 27% of the participants were illiterate, 30.67% were from middle socio-economic status (SES), 91.67%were non-vegetarian, 30.33% were smokers, 26.67 % consumed alcohol and 39.67% were hypertensive. 12.67% of them had a family history of diabetes.

The median (± IQR) duration of diabetes among the participants was 7 ± 10 years and 39% of them were suffering from diabetes for more than 10 years. 61.33% of the participants were currently on Oral Hypoglycemic agents (OHA).This study has found that the proportion of high, moderate and little or no diabetes related distress among the study subjects were 17.33%, 40.34% & 42.33% respectively. For further analysis, participants with moderate and high distress were grouped into a single category – moderate to high distress, to form 2 categories – little or no distress and moderate to high distress. Thus 57.67% of the participants had moderate to high distress. Distribution across 4 domains of distress is shown in fig 1. The socio-demographic characteristics associated with diabetes distress are depicted in Table-1 and multivariate analysis is shown in Table-2.

Table 2: Multiple logistic regression analysis showing factors affecting diabetes distress (n=300)

Characteristics		OR (95% CI for OR)	P value
Sex	Male	1	-
	Female	0.381 (0.130-1.116)	0.078
Community	General	1	-
	SC	1.674 (0.899-3.116)	0.104
	ST	0.219 (0.040-1.186)	0.078
	OBC	1.635 (0.889-3.005)	0.114
Education	Illiterate	0.981 (0.345-2.791)	0.972
	Primary	0.476 (0.184-1.231)	0.126
	Secondary	0.574 (0.223-1.477)	0.250
	Graduation and above	1	-
Occupation	Housewife	**5.580 (1.703 -18.282)**	**0.005**
	Working	1.992 (0.876-4.530)	0.100
	Non-working	1	-
Marital Status	Married	1	-
	Single/Divorced/Widow	1.672 (0.812-3.443)	0.163
Smoking	Yes	0.802 (0.367-1.751)	0.580
	No	1	-
Alcohol Consumption	Yes	0.506 (0.230-1.114)	0.091
	No	1	-

DISCUSSION

In the present study it has been found that 17.33% of the participants were suffering from high diabetes related distress and another 40.34% from moderate diabetes related distress, thus a total of 57.67%, that is more than half of the participants, who had moderate to high

distress. This is inconsistent with a similar study in Africa by Mirghani[16], in which it was found that out of all the participants, 48.50% were distressed, of whom 22.40% were highly distressed and 26% were moderately distressed. In another study conducted by et al Marinho[17], only 14.10% and 27.30% of patients were identified as highly and moderately distressed respectively, which is also inconsistent with this present study. However, in a study by Nanayakkara et al[18], only 7% of the participants had high DD. On the other hand, in a similar study conducted by Aljuaid et al[19] the proportion of moderate to high distress was 25% which is much lower than the observation in this present study. The proportion of DD in the present study is also higher than proportions observed by Devarajooh et al[20] and Gahlan et al[21], 18.00% and 5.40% respectively. These differences may be due to the differences between individuals' perception of distress, as well as the differences in sociodemographic factors of the study population.In the present study it is observed that diabetes distress was significantly associated with sex (more distress in female subjects, p= 0.003), community (more in participants belonging to OBC, p= 0.023), education (more in illiterates, p= 0.003), occupation (more in housewives, p=0.000) and marital status (less in married people, p= 0.019) on univariate analysis; however on applying multiple regression analysis only occupation (housewives, p=0.005) was found to have significant relation.In similar study done in Karnataka[11] association of age with DD (more distress in aged above 60 years) was observed (p=0.018) but there was no association between distress and gender, SES or family history for diabetes, similar to the present study. Again, in a study by Islam et al[22] ≥ 60 years of age group (p< 0.001) was found to have highly significant association, along with residence at sub urban areas, education up to primary level, unemployed, family size more than 5 and a low average monthly income.Similar to the present study, female sex was found to be significantly associated with DD in a study in Australia[18]. On the other hand, Islam et al[22] observed no significant association between sex and DD, though diabetes distress score was higher among females (p > 0.05). It may be due to the fact that females are emotionally more vulnerable and also, they often have to face more discrimination even within the family, than the male diabetics. Moreover, for females, there are more difficulties in coping with diabetes and maintaining strict regimens as well as regularity in follow up visits, while fulfilling the responsibilities of home making simultaneously. A low education level was observed to have significant association with DD in other studies conducted by Islam et al[22], Gahlan et al[21] and Aljuaid et al[19], all of which are in concordance with the present study. In the present study, on multivariate analysis, it was observed that housewives had greater odds of DD (OR=5.58, p=0.005). Similarly, occupation was found to be significantly associated with DD in a study conducted in Bangladesh[22] where unemployed participants had a higher DD score compared to the employed participants. This may be due to the fact that diabetic patients who had regular work or a stable job were more likely to perceive a sense of confidence that they would gain from their ability to work and this helped them to perceive less distress in comparison to unemployed participants. Again, housewives, on the other hand, could find it difficult to cope with managing their lives with diabetes, while fulfilling the multifaceted demands of homemaking simultaneously, for years. Thus, it led them to perceive more distress. Socio-economic status had no significant association with diabetes distress in the present study, similar to a study conducted by Kumar et al[11]. On the other hand, low SES and low average monthly income were associated with distress in studies conducted by Gahlan et al[21] and Islam et al[22] respectively. A low income would bring economic insecurities where patients with low income were more likely to be worried about the costs of repeated hospital visits, the price of medications, etc. which could increase their risk of Diabetes Distress. However, the fact that no such significant association is found between socio-economic status and distress in the present study, could be because of the differences between individuals' perception regarding their

distress as well as hesitations to speak about the difficulties they were facing in day-to-day life due to low income. In the present study, on univariate analysis it was observed that among non-smokers and those who do not consume alcohol, the proportion of moderate to high DD was more than that among smokers and those who consume alcohol (respectively p=0.002 and p=0.001). In a similar study done in Karnataka[11] there is no significant association of DD with smoking and alcohol, however, association with smoking was observed to be statistically significant in another study done in Bangladesh[22], but there the distress score was higher among the smokers, unlike the present study where nonsmokers had more distress. The fact that in the present study smokers and those who consumed alcohol were found to have less distress can be explained in this way that, the response of the participants were depending on subjective perception, and those who had unhealthy habits like smoking and consuming alcohol were less likely to have much concern for their general health status, hence distress levels were also likely to be lesser in them. However, in this present study on applying multiple regression analysis it was revealed that there was no significant effect of smoking or alcohol consumption on DD.No significant association was observed between DD and factors such as diet, duration of DM, family history of DM, hypertension and current antidiabetic medication among the participants in this present study. On the other hand, Islam et al[22] observed highly significant association of distress with duration of diabetes (more distress among those with diabetes for more than 10 years, p< 0.001) and type of anti-diabetic agents (more distress among those using both oral agents and insulin, p< 0.001), the latter of which was supported again by findings of a study by Nanayakkara et al.[18] where participants using Insulin had greater odds of having DD. Again, Gahlan et al[21] observed significant association between distress and hypertension which was not observed in the present study. But Kumar et al[11] on the other hand, did not observe any significant effect due to the duration of diabetes or family history of diabetes on DD, like the present study.

Conclusion

This study highlighted that more than half of the diabetics attending the clinic were distressed and on multivariate analysis, the distress was found to be significantly more among the housewives. This situation can be improved by increased screening for distress among diabetics, providing further education to create more awareness around Diabetes Distress, as well as providing proper counseling to patients who have been diagnosed with DD to prevent the consequences thereof.

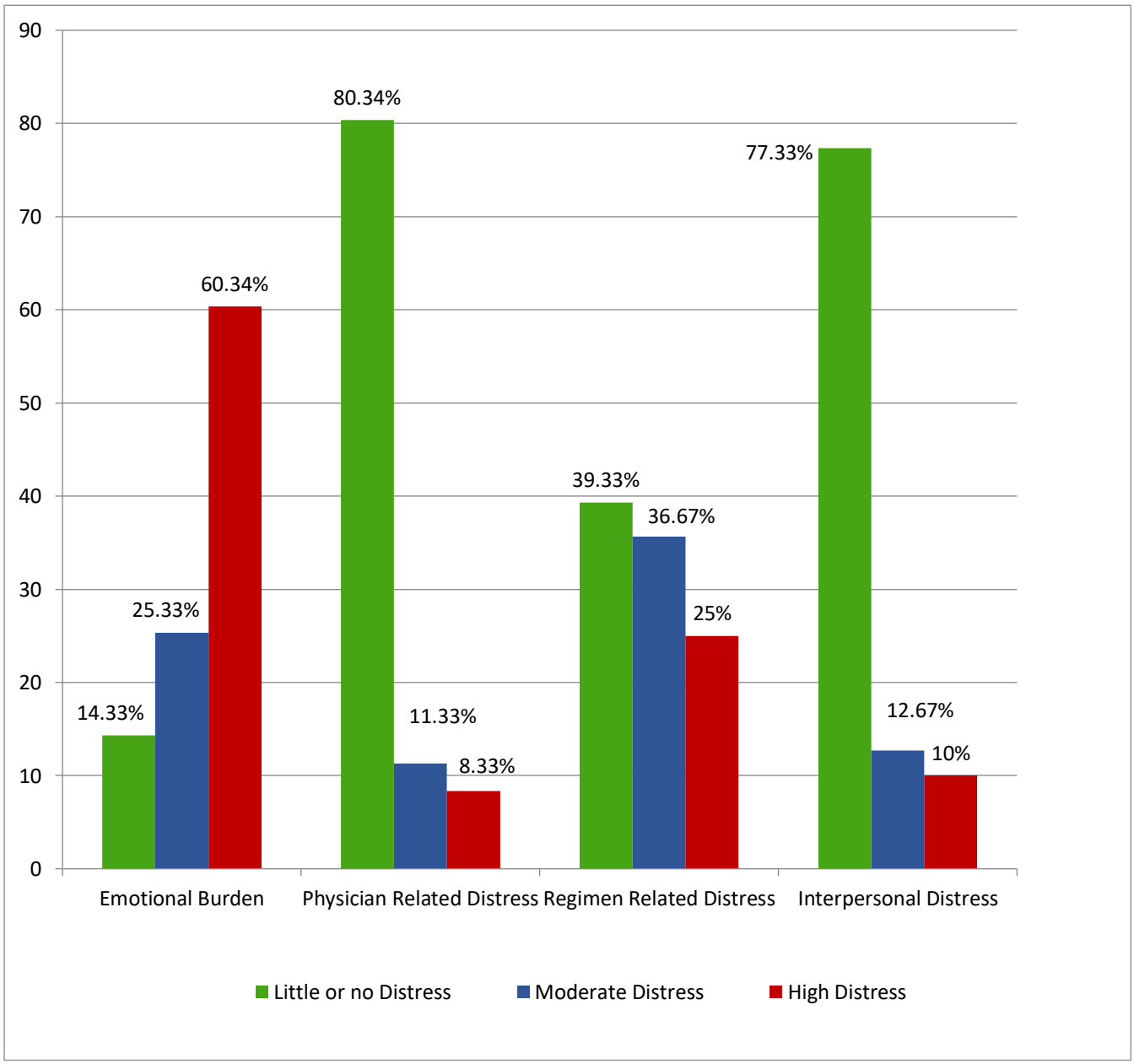

Fig.1: Distribution of study subjects according to 4 domains of diabetes distress (n=300)

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