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Research Article

DETERMINANTS OF PSYCHOSOCIAL PROBLEMS AMONG T2DM PATIENTS IN A DISTRICT OF HARYANA

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ABSTRACT

Background: Diabetes distress is an important psychosocial concern among patients with type 2 diabetes mellitus (T2DM), affecting their disease management and well-being.

Objective: To assess associated factors of diabetes distress among patients with T2DM.

Methods: A hospital-based cross-sectional study was conducted among 503 patients with T2DM in Jhajjar, Haryana. Diabetes distress was assessed using the 17-item Diabetes Distress Scale (DDS-17). Associated factors were analyzed using binary logistic regression.

Results: Diabetes distress was significantly associated with diabetic complications, socioeconomic status, duration of diabetes, age and occupation. Diabetic complications showed the strongest association (aOR 8.24; 95% CI 4.51–15.05; p<0.001).

Conclusion: Routine screening and appropriate psychosocial support should be integrated into diabetes care, particularly for patients with diabetic complications and socioeconomic disadvantages.

KEYWORDS: Type 2 Diabetes Mellitus, Diabetes Distress, DDS-17, Psychosocial Problems, Associated Factors.

Introduction

Psychosocial problems associated with diabetes are important under-appreciated domain of diabetes management. Psychosocial problems have detrimental effect on self-care behaviors and that's why high levels of distress have been associated with higher HbA1C[1]. How people understand their disease and how much support they have are hugely influential in psychological adjustment as life circumstances can change quickly, and stressors (diabetes-related or not) may disrupt blood glucose levels or self-care behaviors and worsen diabetes distress. A diagnosis of Diabetes Mellitus (DM) imposes additional responsibilities, planning and self-monitoring. Such a marked re-adjustment of daily life can be physically and psychologically draining, and inevitably impacts on relationships. In India there are 89.8 million diabetic patients with 10.5% prevalence[2]. In NFHS VI high blood sugar (>140mg/dl) or taking medicine to control blood sugar; were 17.8% among women and 20.9% among men[3].

Psychosocial problems are the emotional response to living with diabetes, due to the burden of relentless daily self-management, worry of its long-term complications and poor family & physician support[4]. Psychosocial problems do arise from the social impact of diabetes such as discrimination, stigma or dealing with other people's lack of understanding and unhelpful reactions along with

financial conditions. It is associated with diabetes to a greater or lesser degree and is a part of living with and managing diabetes. Unmet needs for emotional and financial support from family and/or relatives increases the odds of diabetes distress. It can fluctuate over time and may peak during challenging periods; for example, soon after diagnosis, during major changes in treatment regimen, at diagnosis or worsening of long term complications. It can also peak at times of heightened general stress, when the added burden of diabetes self-care becomes too much. Psychosocial problems manifest in the form of stress, diabetic distress to diabetic burnout. Psychosocial problems have been associated with poor glycemic control and higher HbA1c levels in various studies across the world[1].

Unlike major depression, diabetes distress does not assume psychopathology. Diabetes distress is an expected reaction to diabetes whereas depression refers to how people feel about their life in general. It is acknowledged that there may be a potential overlap between depressive symptoms and diabetes distress—for instance, having increased diabetes distress over time could be a precursor to depression but they are different and should be treated as such because they require different assessment and management strategies[4].

Psychosocial problems should be understood as existing on a continuum, represented in terms of 'magnitude' (severity) and 'content' (nature of the distress). Content refers to the factors linked to feelings of distress; diet control, strain on social relationships, feeling overwhelmed by the diabetes etc. Severity relates to the extent to which an individual experiences these feelings of distress. By addressing the content and severity of the distress, one can begin to distinguish the level of distress an individual is likely to be experiencing and take the appropriate action[5].

Impact of these diabetes related feelings should not be underestimated. It involves the continual need to make decisions and take actions with often unexpected and unsatisfactory outcomes; which often leads to feeling helpless and disengaged from diabetes management. Indian diabetic patients have one of the lowest levels of psychological well-being on the World Health Organization-5 (WHO-5) Well-being Index, which is similar to the global trends[6]. Indian patients also showed a significantly higher perception of burden of social and personal distress associated with diabetes[7]. The study will also explore association of diabetes distress with various socio demographic factors, duration of disease, complications of disease, family history and substance abuse status etc.

Material and Methods

Study Design & Study Population: This hospital based cross-sectional observational study was conducted in out-patient departments of Community Health Centre (CHC) Dighal and Sub Divisional hospital (SDH) Beri of district Jhajjar. All diabetic patients who were attending OPD on the day of visit by the investigator and fulfilling inclusion criteria were recruited in the study through universal sampling technique.

Inclusion Criteria

Diagnosed with T2DM ≥ 1 year, age above 18 years and given written informed consent.

Exclusion Criteria

Co morbidities present in form of other chronic illness such as Cancer, Psychiatric diseases and end stage diseases.

Sample Size

Taking prevalence of psychosocial problems in T2DM patients as 27%[7], relative error (l) as 15%, and using the formula Sample Size = $Z_{(\alpha+\beta)}{}^2pq/l^2$

Where p = 27%

q = 73(100-27)

l = 4.05 (27*15/100)

Thus, sample size comes out to be 480 ($73*27*4/4.05^2$) which was rounded off to 500.

Methodology and Data Collection Tool

Informed consent was taken after explaining the purpose and protocol of the study. Data was collected using interview schedule by the investigator himself. The interview schedule comprised of questions regarding socio-demographic characteristics, self awareness about disease and psychosocial problems. Psychosocial problems were assessed based on diabetes distress scale (DDS-17); containing 17 questions[8].

Interpretation of Scores

The DDS-17 yields a total diabetes distress score plus 4 subscale scores, each addressing a different kind of distress. To score, simply sum the patient's responses to the appropriate items and divide by the number of items in that scale. Current research suggests that a mean item score 2.0 – 2.9 should be considered 'moderate distress,' and a mean item score > 3.0 should be considered 'high distress.' Current research also indicates that associations between DDS scores and behavioral management and biological variables (e.g., HbA1C) occur with DDS scores of > 2.0[8].

Ethical Permission

The permission from institutional ethics committee was obtained before the commencement of the study. The permission for using the tool (DDS-17) had been taken from author.

Statistical Analysis

The data was compiled and entered in the MS Excel sheet. Analysis was carried out using appropriate statistical tests wherever applicable.

Results

Total 503 participants were enrolled in the study; Out of which 260 study subjects (51.7%) were males and 243 were

females (48.3%). Out of the total subjects enrolled, most of them 318 were in the age group 39-60 years constituting 63.2% followed by 20.1% subjects from the age group above 60 years and 16.7% subjects were above the age group 18-39. 156 (31%) subjects had only primary education, followed by high school pass 119 (23.7%) subjects and illiterate 92 (18.3%) subjects. Middle school pass subjects were 89 (17.7%). Graduates and above were only 47 constituting 9.3%. 110 (21.9%) subjects were from middle class, followed by 106(21%) subjects from lower class, 103 (20.5%) from upper middle, 98 (19.5%) from lower middle and 86 (17.1%) subjects were from upper class. 334 (66.4%). Out of 503 study subjects, 200 (39.8%) were jobless, followed by 148 (29.4%) involved in private job, 76 (15.1%) were farmers, 43(8.5%) subjects doing government job and remaining 36 (7.2%) were labours. 281 (55.9%) were having nuclear family, followed by 134 (26.6%) subjects having the joint family and 88 (17.5%) subjects having three generation family. Out of the total subjects enrolled, 300 (59.6%) study participants were having no substance abuse, while 203 (40.4%) study participants have substance abuse of either alcohol or smoking. Out of 203 study participants who had substance abuse; 128 (25.5%) were using tobacco/smoking & 75 (14.9%) were using alcohol. subjects were not having family history of type2 DM; while 169 (33.6%) were having family history. 249 (49.5%) subjects were having type2 DM for 1-5 years, 172 (34.2%) subjects were having type2 DM for 5-20 years and 82 (16.3%) subjects were having type2 DM for more than 20 years. 475 (94.4%) were taking oral medications for type2 DM, while 28 (5.6%) were taking insulin for type2 DM. 301 (59.8%) were having no complications of DM, while 202 (40.2%) were having any one of several complications such as cataract, peripheral neuropathy, coronary artery disease etc (Table 1).

A logistic regression was performed to ascertain the effects of gender, age, education level, profession, social class, family history of DM, complications of DM, duration since diagnosis of DM, substance abuse, family types and types of medications of study participants on the likelihood that participants have diabetes distress. The logistic regression model was statistically significant, $X^2(29) = 178.37$, $p<.001$. The model explained 40% of the variance in diabetes distress (Negelkerke $R^2=.406$) and correctly classified more than 79% of cases. The model was found to be good fit as described by hosmer & lemeshow goodness of fit test ($\chi^2= 14.79$, $p >0.05$) (Table 2).

Table 3, describes the binary logistic regression model applied on the associated factors of diabetes distress. It's evident that factors like complications of type2 DM, SES, duration since diagnosis of type2 DM, age and profession are found to be statistically significant determinants of diabetes distress.

Complications of DM: Odds of developing diabetes distress among study participants who had history of complications of DM was 8.2 times more as compared to those who didn't have any history of complications of type2 DM (reference). This was statistically significant ($p< .001$).

SES: Odds of developing diabetes distress among middle class study participants were 4.8 times more as compared to upper class (reference), whereas the odds of developing diabetes distress among lower class and lower middle class were 6.4 times and 4.2 times more as compared to upper class respectively. This was statistically significant ($p< .05$).

Duration Since Diagnosis of DM: Odds of developing diabetes distress among study participants who had type2 DM for a period between 1-5 years were 5 times more risk of developing diabetes distress as compare to study participants who had type2 DM for a period between 5-20 years (reference). This was statistically significant ($p< .05$).

Profession: Odds of developing diabetes distress among study participants who were jobless; was 2.7 times more as compare to study participants who were in private job (reference). This was statistically significant ($p< .05$).

Age: Odds of developing diabetes distress among study participants who were in age group 18-39; was 2.3 times more as compared to study participants who were in age group 39-60 (reference). This was statistically significant ($p< .05$).

Fig: Component Bar diagram of significantly associated symptoms of psychosocial problems among type2 DM patients (Figure 1).

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Table 1: Demographic profile of participants

Variables	Categories	Frequency	Percentage
Sex	Male	260	51.7
	Female	243	48.3
Age	18-39	84	16.7
	39-60	318	63.2
	Above 60	101	20.1
Educational Qualifications	Illiterate	92	18.3
	Primary	156	31
	Middle school	89	17.7
	High school	119	23.7
	Graduate and above	47	9.3
Socioeconomic Status	Upper	86	17.1
	Upper middle	103	20.5
	Middle	110	21.9
	Lower middle	98	19.5
	Lower	106	21
Profession	Jobless	200	39.8
	Labour	36	7.2
	Farmer	76	15.1
	Private job	148	29.4
	Government job	43	8.5
Type of family	Nuclear	281	55.9
	Three generation	88	17.5
	Joint	134	26.6
Substance abuse	Yes	203	40.4%
	No	300	59.6%
Family history of type2 DM	Yes	169	33.6
	No	334	66.4
Duration of type2 DM	1-5	249	49.5
	5-20	172	34.2
	>20	82	16.3
Treatment modality	Oral	475	94.4
	Insulin	28	5.6
Complications of type2 DM	Yes	202	40.2
	No	301	59.8

Table 2: Logistic Regression model summary

Omnibus test of model coefficient X^2(df, p value)	Negelkerke R^2	Hosmer & Lemeshow goodness of fit test X^2(df, p value)	Classification table overall percentage (cut off is 0.5)
178.37 (29, <.001)	.406	14.79 (8, 0.063)	79.3%

Table 3: Results of Logistic Regression analysis: association of factors with probability of diabetes distress

Factors	Prevalence of DD		β	a OR (e^{β}) (95% C.I.)	Wald statistics (df)	P value
Complications of diabetes	24.9%	Absent	Reference	-	-	-
	57.4%	Present	2.10	8.24 (4.51-15.05)	47.13 (1)	<.001
Social class (SES)	24.5%	Upper lass	Reference	-	25.56 (4)	<.001
	29.1%	Upeer iddle class	-.17	.84 (.36-1.93)	.16 (1)	.684
	46.4%	Middle class	1.23	3.43 (1.46-8.76)	8.08 (1)	<.004
	43.8%	Lower middle class	1.60	4.98 2.10-11.02)	13.39 (1)	<.001
	43.4%	Lower class	1.10	3.02 (1.29-7.02)	6.58 (1)	.01
Duration of diagnosis of diabetes	41.3%	1-5 yrs	Reference	-	23.87 (2)	<.001
	26.2%	5-20 yrs	-1.51	.21 (.11-.40)	23.70 (1)	<.001
	52.7%	>20 yrs	-.96	.38 (.12-1.04)	3.46	.061
Profession	42%	Jobless	Reference	-	11.47 (4)	.022
	50%	Labour	.75	2.13 (.76-5.96)	2.08 (1)	.149
	38.2%	Farmer	-.54	.58 (.26-1.25)	1.89 (1)	.169
	50%	Private job	-1.02	.36 (.17-.76)	7.07 (1)	.008
	34.9%	Government job	-.84	.42 (.15-1.20)	2.58 (1)	.360
Age	42.9%	18-39	Reference	-	10.69 (2)	.005
	30.5%	39-60	-.84	.43 (.23-.79)	7.27 (1)	.007
	57.4%	>60	.082	1.08 (.36-3.25)	.02 (1)	.883
Education	37%	Illiterate	Reference	-	7.96 (4)	.093
	39.8%	Primary educated	.-.39	.67 (.32-1.41)	1.08 (1)	.299
	45%	Middle educated	.31	1.36 (.58-3.17)	.52 (1)	.470
	34.4%	Higher educated	.26	1.30 (.51-3.31)	1.08 (1)	1.41
	29.8%	Graduate	-.68	.50 (.16-1.60)	.30 (1)	.582
Type of Medications	35.8%	Oral	reference	-	-	-
	67.8%	Insulin	.82	2.27 (.82-6.27)	2.50 (1)	.114
Family history of DM	30.5%	Not present	Reference	-	-	-
	52.7%	Present	.38	1.47 (.86-2.51)	2.05 (1)	.152
Family type	35.6%	Nuclear	Reference	-	1.03 (2)	.596
	42%	Three generation	-.23	.78 (.40-1.53)	.49 (1)	.481
	40.3%	Joint	-.29	.74 (.40-1.37)	.88 (1)	.346
Substance abuse status	32%	No addiction	Reference	-	-	-
	46.8%	addiction	-.31	.73 (.39-1.36)	.96 (1)	.575
Gender	36.6%	Female	reference	-	-	-
	39.2%	Male	.24	1.27 (.72-2.21)	.71 (1)	.398

Discussion

Association with AGE

Age was significant predictor of diabetes distress in logistic regression where getting odds of diabetes distress in age group 18-39; was 2.3 times more as compared to age group 39-60 ($p<0.05$). Similar findings were observed in Nayankara N et al[9], (Australia) study greater odds of diabetes distress found with older age ($p<0.05$). In Delhanty L et al[10], (USA) study; younger age group had greater diabetes distress in comparison to mid age group ($p<0.05$). These findings indicate that when they are diagnosed to have the disease they feel greater distress as it's hard to accept diagnosis of a lifelong chronic disease and then with time they get a bit used to it but later again when complications arise along with shorter life expectancies in older age, their distress level increases.

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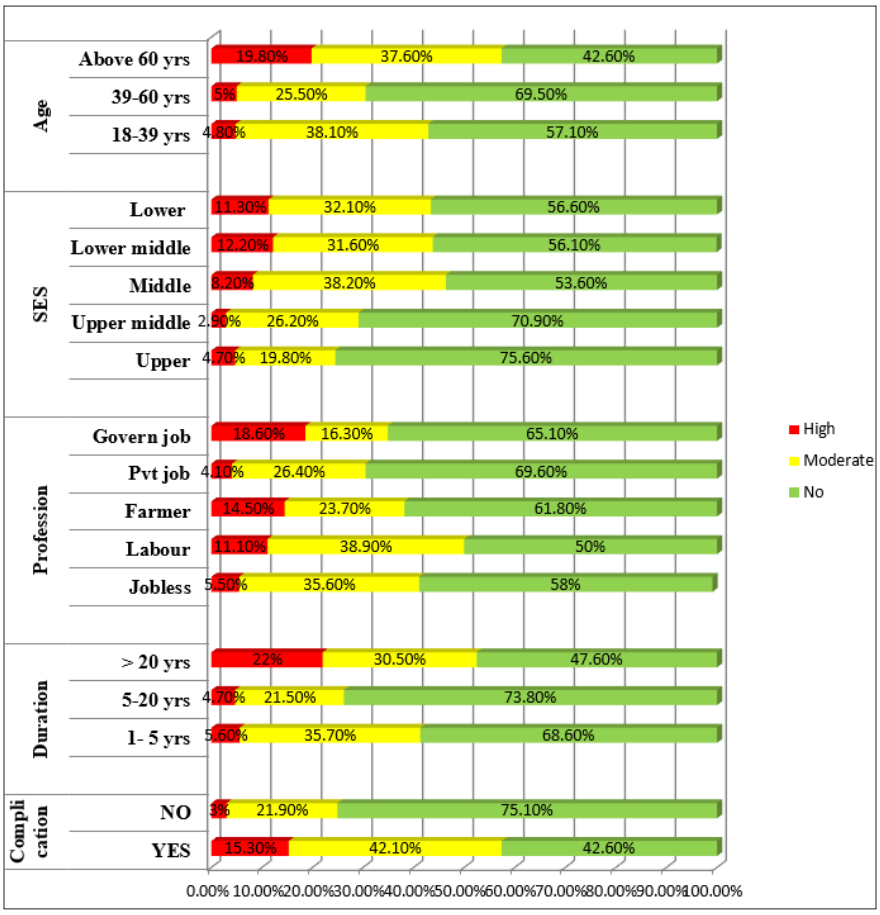


Figure 1.Component Bar diagram of significantly associated symptoms of psychosocial problems among type2 DM patients

Association with Profession

Profession was significant predictor of diabetes distress in logistic regression where getting odds of diabetes distress in jobless group; was 2.7 times more as compared to private job group ($p<0.05$). Similar findings observed in Islam et al[11], (Bangladesh) study, unemployed had higher diabetes distress score 2.35 in comparison to employed 1.96 on DDS-17 scale and this difference was significant ($p<0.05$). These similar findings indicate that stress of unemployment and low grades of profession added to worries and fear when a lifelong chronic disease like DM was diagnosed and it wasn't easy for these groups to change their lifestyle according to disease. In contrast to our study, Sendhilkumar M et al[12], (Chennai) study observed that professionals, business man & skilled worker had increased adjusted odd of 1.8, 1.1 & 2.0 respectively; contrast finding may be due to the fact that participants engaged in professional jobs or business were found to have higher stress levels due to their daily job related factors.

Association with SES

SES was significant predictor of diabetes distress in logistic regression where getting odds of diabetes distress was 4.8 times more in middle class in comparison to upper class ($p<0.05$). Similar finding was observed in Islam et al[11] (Bangladesh) study, in which low SES group had diabetes distress score 2.38, lower middle SES had DDS 2.17, middle SES had DDS 1.85 & higher SES had DDS 1.75 and this difference was significant ($p<0.05$). These findings indicate that the prevalence of diabetes distress is more in lower SES group as diabetes is a chronic disease requiring lifelong medications which are costly and frequent investigations.

Association with Duration of DM

Duration of DM was significant predictor of diabetes distress in logistic regression where getting odds of diabetes distress in the group having DM for 1-5 years; was 5 times more as compared to the group having DM for 5-20 years ($p<0.05$). Similar pattern observed in Patra S et al[13],(Bhuvneshwar) study in which the prevalence of diabetes distress was high in <5 years of duration of diabetes and also in patients with more than 10 years duration of diabetes ($p<0.05$). Similar findings indicate towards root cause of origin of diabetes distress as when patients get diagnosed with a lifelong chronic disease coupled with lifestyle changes they will have to make various lifestyle changes which increases their stress level.

Association with Complications of DM

Complications of DM was significant predictor of diabetes distress in logistic regression where odds of developing diabetes distress among study participants who had history

of complications of DM was 8.2 times more as compared to those who didn't have any history of complications of type2 DM ($p<0.05$). Similar findings were observed in Thomas L et al[14], (Vellore) study; where adjusted odds for having diabetes distress was 1.39 times more in subjects who had complications of T2DM in comparison to subjects who didn't have. Similar findings may be due to the fact that complications of T2DM are associated with marked psychological distress due to decreased functional ability, social isolation, and increased financial burden along with increased worries of reduced life expectancies. In contrast to our findings Tunsucaht K et al[15], (Thailand) & Sendhilkumar M et al[12], (Chennai) didn't found any significant association between diabetes distress and complications of T2DM ($p >0.05$); although the prevalence of diabetes distress was equal/more in study subjects who had complications of T2DM in comparison to subjects who didn't have.

Conclusion, Limitation & Recommendation

The major determinants were younger & old age group, being jobless & labour, presence of complications, presence of long duration of disease and lower SES. Therefore, these factors should be targeted in the system of diabetes care to take immediate intervention and prevent further problems.

There are few potential limitations of this study. At first the data reported are cross sectional, and implications about causation can only be inferred. Second, the study was based on participants' reports of data and therefore, there may be recall bias. Lastly the study is restricted one district Jhajjar, hence the findings may not be representative of whole state or nation.

Based on findings of this study we recommend that psychosocial screening of diabetes distress at every level of diabetes care, an advocacy program at the community level to improve the awareness level of psychosocial well-being of persons with diabetes and a longitudinal study to follow-up and elucidate the determinants of diabetes distress.

Conflict of Interest

None

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