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### **Prevalence of Depression and Anxiety in Type 2 Diabetes Mellitus patients in tertiary care hospital; Pilot Study**

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#### **ABSTRACT**

**BACKGROUND:** The prevalence of depression and anxiety in diabetes is considerably higher than normal population and found to have a negative impact on diabetes.

**OBJECTIVES:** To assess the prevalence of anxiety and depression and to identify their associated risk factors among people with type 2 diabetes mellitus.

**METHOD:** Descriptive study was done in Shree Clinics (Diabiologist and cardiologist), in Belagavi. Total 50 patients with type 2 diabetes mellitus were interviewed for depression and anxiety by administering the Hospital Anxiety and Depression Scale (HADS).

**RESULTS:** Of the total 50 patients surveyed, depression and anxiety were found in 37(54%) and 21(42 %) respectively. In multivariate analysis age and type of family were significantly associated with depression, while age was significantly associated with anxiety.

**CONCLUSION:** This study found a high prevalence of depression and anxiety in patients with Type 2 DM. Therefore the care of individuals with type 2 diabetes mellitus (DM) should include the screening and possible treatment of depression and anxiety in order to achieve and sustain treatment goals.

**KEY WORDS:** Depression, Anxiety, Type 2 Diabetes Mellitus (DM)

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## **INTRODUCTION**

Diabetes mellitus is a group of metabolic diseases characterized by hyperglycemia resulting from defects in insulin secretion, insulin action, or both. It has been classified as type 1 DM and type 2 DM. Type 1 DM, a subtype of Diabetes Mellitus results due to complete or near total insulin deficiency whereas Type 2 DM characterized by variable degree of insulin resistance, impaired insulin secretion and increased glucose production.<sup>1</sup> The WHO estimated the population of diabetes patients to increase from 171 million in 2000 to 366 million by 2030 worldwide.<sup>2</sup> Prevalence study also reported that there are currently 285 million people with diabetes worldwide and this number is set to increase to 438 million by year 2030.<sup>3</sup> Type 2DM is estimated to be 90-95% of the total global morbidity of DM.<sup>4</sup> India has more than 50 million Type 2 diabetes patients.<sup>5</sup> India will soon be the capital of diabetes. Depression and anxiety are other prevalent condition in diabetes mellitus. Approximately 340 million people worldwide suffer from depression at any given time.<sup>6</sup> The World-wide estimated prevalence of depression and anxiety is 25% and 7.3%. Depression disorders are more in women than men. Life time prevalence of depression is 10-20%<sup>7</sup>. The prevalence of depression and anxiety in diabetes is considerably higher than normal population and lies between 12-28% and 4-58%. However, the prevalence varies from 12% to 48% in various studies across geographic boundaries.<sup>8</sup>

## **MATERIAL AND METHODS**

Non-Experimental Descriptive study was done in Shree Specialty Clinic (Diabetologist & Cardiologist), in Belagavi after obtaining formal permission from the concerned authority. The data collection period was 1 month in February 2018. All confirmed patients with Type 2 Diabetes mellitus of age between 30-60 years visiting the outpatient clinic/department were evaluated in the study. The nature and purpose of the study was explained and the confidentiality of information was assured. Written informed consent was subsequently obtained from the patients who are agreed to participate.

## **INCLUSION CRITERIA**

Patients with Type 2 DM (Fasting glucose level more than or equal to 126mg/dl and post prandial, more than or equal to 200mg/dl) were considered for the study, patients age between 30-60 years.

## **EXCLUSION CRITERIA**

The patients who were not willing to participate in the study, Participants who are diagnosed psychiatric problems/illness or those who are currently on anti-depressants, pregnant women and seriously ill patients were excluded from the study.

## **DATA COLLECTION**

The data regarding Demographic and status of DM were assessed by interview the patient and supplemented from patients records.

The prevalence of depression and anxiety was assessed by Hospital Anxiety and Depression Scale (HADS) originally developed by Zigmond and Snaith and translated into the local Kannadalanguage. The HADS Comprises 14 items, 7 of which measure anxiety (HADS-A) and another 7 measures depression (HADS-D). These items are Scored on a four point Likert Scale Score ranging from 0 (Not Present) to 3 (Considerable). The Item Scores were summed to provide Subscale Scores of anxiety and depression, ranging between 0 and 21, and the total summed Score ranges from 0 to 42. A higher score represents higher anxiety or depression. The scores are categorized as follows: Normal (0-7), Borderline abnormal (8-10), Abnormal (11-21). A score of 8 points or more was considered the cutoff point that was suggested by its creators, and others.

## **STATISTICAL ANALYSIS**

Analysis was performed using the statistical package for social Sciences (SPSS) Version 22.0 for descriptive analysis, frequency, percentage, mean, median and standard deviation were used,

Karl Pearson's Coefficient of Correlation and ANOVA will be used to identify the correlation and Chi-square test were used to test the association for categorized variables. The Significance level was set at 5%. Results were expressed as odds ratio OR and 95% confidence intervals (CI).

## **RESULT**

In the Present study the total participants were 50, in which 70% were male and 30% female participants. Most of the study participants i.e. about 40% belongs to the age group of 31-40 years similarly 40% were in the age group of 41-50 followed by 20% in 51- 60 years. Majority of the subjects i.e. 66% of the study participants had history of diabetes for last 0-5 years, 32% had history of 6-10 years and 2% had history of 60-20 years. 78% of the study subjects were on oral hypoglycemic agents (OHA), 18% on both insulin and OHAs and only 4% on insulin alone. Most of the study participants i.e. 84% belonged to Middle Class, 16% belonged to Upper and Lower Class. Majority of the subjects i.e. 64% had married, 26% had Unmarried and 10% had Divorced/divorced. 78% of the study subjects were Graduates and above, and 16% of the subjects were Higher Secondary Education. 36% of the study subjects were Private Employee and 24% of

subjects were Government Employee. Majority of the subjects i.e.80% were belonged to Nuclear family and 20% belonged to Joint family. Majority 64% of the participants were Hindu and 22% belonged to others.(Table 1)

**Table 1: Distribution of study respondents by different characteristics (n=50)**

	No of respondents	% of respondents
<b>Age groups</b>		
30-40	20	40.0
41-50	20	40.0
51-60	10	20.0
<b>Gender</b>		
Male	35	70.0
Female	15	30.0
<b>Marital Status</b>		
Married	32	64.0
Unmarried	13	26.0
Divorced/divorced	5	10.0
<b>Qualifications</b>		
No formal Education	1	2.0
Primary School	1	2.0
Secondary School	1	2.0
Higher Secondary Education	8	16.0
Graduates and above	39	78.0
<b>Socio economic status</b>		
Upper Class	4	8.0
Middle Class	42	84.0
Lower Class	4	8.0
<b>Occupations</b>		
Government Employee	12	24.0
Private Employee	18	36.0
Self Employed	10	20.0
Agriculture	1	2.0
House wife	9	18.0
<b>Types of family</b>		
Joint	10	20.0
Nuclear	40	80.0
<b>Religion</b>		
Hindu	32	64.0
Muslim	5	10.0
Christian	2	4.0
Others	11	22.0
<b>Duration</b>		
0-5	33	66.0
6-10	16	32.0
16-20	1	2.0
<b>Treatment</b>		
OHD	39	78.0
Insulin	2	4.0
Insulin and OHD	9	18.0
Total	50	100.0

In Table-2, there was a “positive correlation” between the levels of depression and anxiety with the Karl Pearson’s correlation coefficient;  $r=0.8774$ , which showed that, as the depression scores went higher, anxiety was also at a higher state. Thus, it can be ruled out that patients with more depression were even more anxious of their condition.

**Table 2: Correlation between depression and anxiety scores by Karl Pearson’s correlation coefficient method**

Variables	Correlation between depression scores with		
	r-value	t-value	p-value
Anxiety scores	0.8774	12.6711	0.0001*

\* $p < 0.05$

Significant associations were observed between depression and the various demographic characteristics ( $p < 0.05$ ), the results stated that a statistically significant association with Age and type of family with depression where as others like gender, marital status, qualification, socio economic status, occupational status, religion, duration and type of treatment did not show any statistically significant association with depression. In the present study 16 (32%) were had border line depression and 11(22%) were had abnormal depression.as shown in the **table-3**.

**Table 3: Association between levels of depression with different characteristics**

	Nor mal	%	Borderl ine	%	Abnorm al	%	Total	%	Chi-square	p-value
<b>Age groups</b>										
30-40	4	20.0	9	45.0	7	35.0	20	40.0	10.5010	0.0330*
41-50	12	60.0	6	30.0	2	10.0	20	40.0		
51-60	7	70.0	1	10.0	2	20.0	10	20.0		
<b>Gender</b>										
Male	13	37.1	12	34.3	10	28.6	35	70.0	4.4700	0.1070
Female	10	66.7	4	26.7	1	6.7	15	30.0		
<b>Marital Status</b>										
Married	18	56.3	7	21.9	7	21.9	32	64.0	8.2110	0.0840
Unmarried	2	15.4	7	53.8	4	30.8	13	26.0		
Divorced/divorced	3	60.0	2	40.0	0	0.0	5	10.0		
<b>Qualifications</b>										
No formal Education	0	0.0	1	100.0	0	0.0	1	2.0	12.3160	0.1380
Primary School	1	100.	0	0.0	0	0.0	1	2.0		
Secondary School	0	0.0	1	100.0	0	0.0	1	2.0		
Higher Secondary Education	7	87.5	1	12.5	0	0.0	8	16.0		
Graduates and above	15	38.5	13	33.3	11	28.2	39	78.0		
<b>SES</b>										
Upper Class	4	100.	0	0.0	0	0.0	4	8.0	6.6320	0.1570
Middle Class	17	40.5	14	33.3	11	26.2	42	84.0		

Lower Class	2	50.0	2	50.0	0	0.0	4	8.0		
<b>Occupations</b>										
Government Employee	8	66.7	3	25.0	1	8.3	12	24.0	11.1420	0.1940
Private Employee	6	33.3	6	33.3	6	33.3	18	36.0		
Self Employed	2	20.0	4	40.0	4	40.0	10	20.0		
Agriculture	1	100.0	0	0.0	0	0.0	1	2.0		
House wife	6	66.7	3	33.3	0	0.0	9	18.0		
<b>Types of family</b>										
Joint	8	80.0	2	20.0	0	0.0	10	20.0	6.4540	0.0400*
Nuclear	15	37.5	14	35.0	11	27.5	40	80.0		
<b>Religions</b>										
Hindu	17	53.1	7	21.9	8	25.0	32	64.0	4.9660	0.5480
Muslim	2	40.0	2	40.0	1	20.0	5	10.0		
Christian	1	50.0	1	50.0	0	0.0	2	4.0		
Others	3	27.3	6	54.5	2	18.2	11	22.0		
<b>Duration</b>										
0-5	13	39.4	13	39.4	7	21.2	33	66.0	3.3690	0.4980
6-10	9	56.3	3	18.8	4	25.0	16	32.0		
16-20	1	100.	0	0.0	0	0.0	1	2.0		
<b>Treatment</b>										
OHD	15	38.5	15	38.5	9	23.1	39	78.0	5.4220	0.2470
Insulin	2	100.	0	0.0	0	0.0	2	4.0		
Insulin and OHD	6	66.7	1	11.1	2	22.2	9	18.0		
Total	23	46.0	16	32.0	11	22.0	50	100.0		

\*p<0.05

Associations with anxiety is demonstrated that there was a statistically significant association between anxiety and type of family(p<0.05).In this study 10(20%) participates were had border line anxiety and 11(22%) were had abnormal anxiety as shown in the **table 4**.

**Table 4: Association between levels of anxiety with different characteristics**

	Normal	%	Borderli ne	%	Abnorm al	%	Total	Chi-square	p-value
<b>Age groups</b>									
30-40	7	35.0	6	30.0	7	35.0	20	9.0190	0.0610
41-50	14	70.0	4	20.0	2	10.0	20		
51-60	8	80.0	0	0.0	2	20.0	10		
<b>Gender</b>									
Male	18	51.4	7	20.0	10	28.6	35	3.1590	0.2060
Female	11	73.3	3	20.0	1	6.7	15		
<b>Marital Status</b>									
Married	19	59.4	6	18.8	7	21.9	32	5.7200	0.2210
Unmarried	5	38.5	4	30.8	4	30.8	13		
Divorced/divo	5	100.	0	0.0	0	0.0	5		

rced									
<b>Qualifications</b>									
No formal Education	1	100.	0	0.0	0	0.0	1	10.2120	0.2500
Primary School	1	100.	0	0.0	0	0.0	1		
Secondary School	1	100.	0	0.0	0	0.0	1		
Higher Secondary Education	8	100.	0	0.0	0	0.0	8		
Graduates and above	18	46.2	10	25.6	11	28.2	39		
<b>Socio economic status</b>									
Upper Class	3	75.0	1	25.0	0	0.0	4	4.6330	0.3270
Middle Class	22	52.4	9	21.4	11	26.2	42		
Lower Class	4	100.	0	0.0	0	0.0	4		
<b>Occupations</b>									
Government Employee	8	66.7	3	25.0	1	8.3	12	13.6070	0.0930
Private Employee	10	55.6	2	11.1	6	33.3	18		
Self Employed	2	20.0	4	40.0	4	40.0	10		
Agriculture	1	100.	0	0.0	0	0.0	1		
House wife	8	88.9	1	11.1	0	0.0	9		
<b>Types of family</b>									
Joint	10	100.	0	0.0	0	0.0	10	9.0520	0.0110*
Nuclear	19	47.5	10	25.0	11	27.5	40		
<b>Religions</b>									
Hindu	18	56.3	6	18.8	8	25.0	32	1.6990	0.9450
Muslim	3	60.0	1	20.0	1	20.0	5		
Christian	1	50.0	1	50.0	0	0.0	2		
Others	7	63.6	2	18.2	2	18.2	11		
<b>Duration</b>									
0-5	17	51.5	9	27.3	7	21.2	33	3.7420	0.4420
6-10	11	68.8	1	6.3	4	25.0	16		
16-20	1	100.	0	0.0	0	0.0	1		
<b>Treatment</b>									
OHD	20	51.3	10	25.6	9	23.1	39	4.8000	0.3080
Insulin	2	100.	0	0.0	0	0.0	2		
Insulin and OHD	7	77.8	0	0.0	2	22.2	9		
Total	29	58.0	10	20.0	11	22.0	50		

\*p<0.05

## **DISCUSSION**

Of 50 Diabetes mellitus, the prevalence of depression in the present study was 54%. i.e.16 (32%) were had border line depression and 11(22%) were had abnormal depression. In a study done by Mathew CS et al, prevalence of depression in consecutive patients with type 2 diabetes mellitus was reported that 38.8% had depressive symptoms. Among them 25% had mild depression, 12.5% had moderate depression, and 1.3% had severe depression<sup>9</sup>. Majed S, et al, reported that 45.7% moderate depression 25.8% whereas it was moderately severe or severe depression 19.9% of them<sup>10</sup>. Cernea Simona et al. the prevalence of depression, anxiety and cognitive impairment in patients with type 2 diabetes stated that 41.7% among them 34.3% had moderate depression and 7.4% presented major depression<sup>11</sup>. Similarly, the prevalence of Anxiety in the present study was 42%. i.e.10 (20%) participates were had border line anxiety and 11(22%) were had abnormal anxiety. In a study conducted by Khuwaja AK, et al, the prevalence of Anxiety and Depression among outpatients with type 2 diabetes reported that 57.9% had anxiety<sup>12</sup>. AlBekairy A et al, reported that 50.6% patients with anxiety among 17.1% had moderate anxiety and 8.9% had sever anxiety. This was agreement with our study. Factors like age, type of Family have played role in increased prevalence of depression and anxiety in the present study<sup>13</sup>.

## **CONCLUSION**

Our study stated a high prevalence of depression and anxiety in patients with Type 2DM. We further identified several risk factors that were statistically significantly associated with depression and anxiety including Age and type of family. Early detection of depression/anxiety status and encouraging daily physical activity may be cost-effective measures to effectively prevent depression and anxiety in individuals with Type2 DM.

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