

## Prevalence of Depression among the Patients with Type 2 Diabetes Mellitus Attending the Urban Health Training Centre, Thirumazhisai, Tamilnadu

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### Abstract:

**Introduction:** Depression is the more common mental health condition found among the chronic diseases. The prevalence of both diabetes and depression are rapidly increasing and the presence of depression in patients with type 2 diabetes could hinder the adherence and effectiveness of treatment.

**Objective:** This study aimed to estimate the prevalence of depression and to identify the factors influencing depression among patients with type 2 diabetes mellitus in Non Communicable Disease(NCD) clinic.

**Method:** A cross – sectional study was conducted among Type 2 diabetes mellitus attending the NCD clinic of the urban health training centre between January and April 2021. Demographic, clinical and diabetes related information was collected through a semi – structured questionnaire. Level of depression was assessed using a standard questionnaire (PHQ – 9 questionnaire). The total score of 5 – 9, 10 – 14 and >15 were graded as mild, moderate and severe forms of depression respectively. Data analysis was done using SPSS software version 21.


**Results:** The mean age of the study subjects was 53±7 yrs and majority (60%) were males. The prevalence of depression was 30.8 % and among them 71.7 % had mild depression while 12.8 % had severe form of depression. Factors such as female gender, higher educational status and substance use such as alcohol and smoking were found to be significantly associated with the presence of depression. **Conclusion:** It is imperative to screen for depression and lay emphasis on counseling services for the effective management of diabetes thereby improve the quality of their life.

**Key Words :** Depression, Prevalence, Type 2 Diabetes mellitus

### Introduction:

Depression is most common mental disorder affecting 5% of the adults globally and it is the leading cause of disability worldwide.<sup>[1]</sup> It is characterized by sadness, loss of interest in work, self guilt , difficulty in sleep, decreased sleep and lack of concentration. It is difficult to cope up with daily activities in depression and can lead to suicide in its severe form<sup>[2]</sup> Keeping in view of its prevalence, morbidity and the economic burden, depression is a major disorder of public health importance.<sup>[3]</sup>

Diabetes mellitus is characterized by chronic hyperglycemia due to absolute or relative deficiency of insulin secretion or action<sup>1</sup> and it is classified into Type 1 and Type 2 Diabetes mellitus. Type 2 diabetes mellitus (T2DM) usually occurs in later adulthood and contributes 95% of all cases. It develops due to both insulin resistance and defective beta cell function. Failure of adequate treatment of T2DM can lead to complications such as retinopathy, neuropathy and nephropathy.<sup>[4]</sup> The World Health Organization predicted that by the year 2025, 300million people will be affected from diabetes. In

Quick Response Code	<b>Access this article online</b>	<b>How to cite this article :</b> Selvaraj B, Sugavanam A, Pranavesh K, Parasuraman G, Dutta R. Prevalence of Depression among the patients with Type 2 Diabetes Mellitus attending the Urban Health Training Centre, Thirumazhisai, Tamilnadu. Healthline. 2022; 13(3): 255-260.
	<b>Website :</b> www.healthlinejournal.org	
	<b>DOI :</b> 10.51957/Healthline_399_2022	

India there is a steady increase in prevalence of Type 2 Diabetes mellitus and it is expected to have to 69.9 million diabetic cases by the year 2025.<sup>[4]</sup>

Depression is more prevalent among the diabetics and the coexistence of diabetes and depression are rapidly increasing.<sup>[5]</sup> Presence of depression in diabetic patients causes poor self management and decreased adherence to anti - diabetic treatment.<sup>[6]</sup> They are at more risk of fatal cardiovascular events like along with risk factors like smoking, obesity and sedentary lifestyle.<sup>[7]</sup> The micro and macro vascular complications were found to be higher in diabetes with depression than those with diabetes alone.<sup>[7]</sup>

Many diabetic patients with depression are unrecognized by the treating physicians. Only one third are treated appropriately for both diabetes and depression. Treatment of both these disorders is important for effective management.<sup>[8]</sup> This study aimed to estimate the prevalence of depression using (PHQ - 9 questionnaire) and to identify the factors influencing depression among patients with type 2 diabetes mellitus attending the NCD clinic of urban health training centre in Thirumazhisai, Thiruvallur District, Tamilnadu.

#### Method:

A cross sectional study was conducted to assess the prevalence of depression among the patients with Type 2 diabetes mellitus attending the NCD clinic of urban health training centre in Thirumazhisai, field practice area of Saveetha Medical College from January 2021 to April 2021.

Based on the study conducted by Larijani et al<sup>[9]</sup> in Iran in the year 2004, the prevalence of depression among type 2 diabetes mellitus patients was 41.9%, with an alpha error of 5% and the limit of accuracy of 15% the minimum sample size required for the study was estimated to be 250 study subjects by using the formula  $Z^2 1-\alpha_{/2} P(1-P)/\epsilon^2 P$

Out of total diabetic patients enrolled in the NCD clinic which was 278 patients, based on the exclusion criteria the final sample size achieved was 253. Before the commencement of this study, consent was obtained from the study participants.

#### Inclusion criteria:

Patients with Type 2 Diabetes mellitus above the age of 30 years and those who have been diagnosed at least for a minimum period of 6 months prior to the commencement of the study.

#### Exclusion criteria:

Patients with Type 2 Diabetes mellitus who have had clinical evidence of any other psychiatric illness excluding depression, those who were not willing to participate in the study and those who had no record of last recorded Capillary Blood Glucose (CBG) value in last 2 weeks were excluded.

The study tool consisted of two parts, first part was a pre - tested, semi - structured interview schedule which solicited information on the socio - demographic profile, history of other co - morbidities and details about substance abuse, last recorded capillary blood glucose level within 2 weeks which was obtained from the medical records. Socio-economic class was accessed using BG-Prasad classification.<sup>[10]</sup> Level of random capillary blood glucose was classified as per ICMR guidelines.

The second part being with regard to depression, a standard questionnaire Public health questionnaire - 9 (PHQ - 9) was used to assess the presence of depression and its severity. PHQ - 9 is a 9 - item questionnaire designed to screen for the presence of depression and its severity according to the DSM - IV criteria.<sup>[11]</sup> Each item in PHQ-9, queries the presence and frequency of depressive symptoms experienced by the study subjects in the last two weeks. Each item is rated on a 4-point Likert scale ranging from 0 (not at all) to 3 (nearly every day). The total score of the PHQ-9 ranges from 0 to 27 and recommended severity cut - off scores are: none (< 5), mild (5 - 9), moderate (10 - 14), moderately severe (15-19), severe (> 19).

Data analysis: Data entry and analysis were done using the statistical package SPSS V22 version. Descriptive statistics were calculated for the background characteristics and to determine the proportion of diabetics with depression. Association between the factors and the presence of depression were analyzed by the test of proportions and chi - square test was used as a statistical test of significance.

**Ethical approval:**

Ethical clearance was obtained from the Institutional Ethics Committee, Saveetha University (SRB reference No: SMC / IEC / 2021 / 03 / 167) before the conduct of the study.

**Results:**

This study included 253 study subjects with Type 2 diabetes mellitus attending the NCD clinic of

urban health training centre in Thirumazhisai, field practice area of Saveetha Medical College from January 2021 to April 2021.

The study subjects were in the age group between 30 to 80 yrs and the mean age of the subjects were 53 years  $\pm$ 7 SD. Majority of subjects 155 (61.3%) belonged to the age group of 45 to 55 yrs. The background details of the study subjects are given in Table 1.

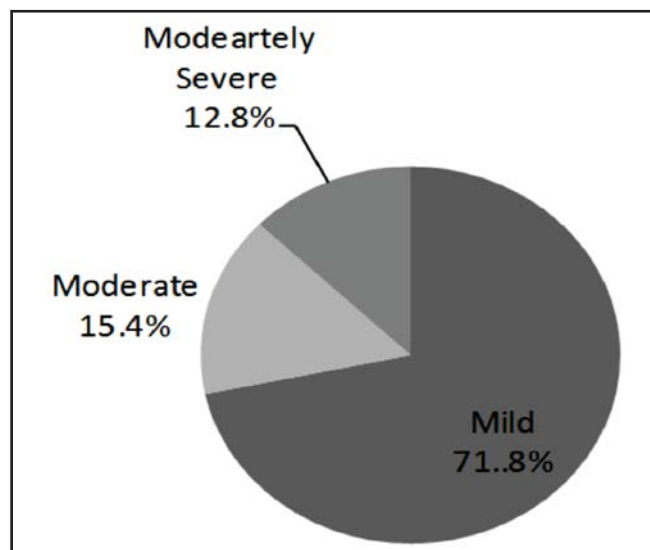
**Table 1: Background details of the study subjects (N = 253)**

Sr. No.	Characteristics	N	(%)
1	<b>Age</b>		
	Less than 45 years	19	7.5
	45 – 55 years	155	61.3
	56 – 65 years	65	25.7
	Above 65 years	14	5.5
2	<b>Gender</b>		
	Male	152	60
	Female	101	40
3	<b>Education Status</b>		
	Illiterate	24	9.5
	Primary education	40	15.8
	Secondary education	67	26.5
	Higher secondary education	57	22.5
	Graduate & above	65	25.7
4	<b>BG-Prasad Socio – economic class</b>		
	Lower middle class	22	8.7
	Middle class	46	18.2
	Upper middle	64	25.3
	Upper	121	47.8
5	<b>Consumption of Alcohol</b>		
	Yes	68	26.8
	No	185	73.2
6	<b>Smoking</b>		
	Yes	76	30
	No	177	70
7	<b>Duration of Diabetes</b>		
	Less than 5 years	112	44.3
	More than 5 years	141	55.7
8	<b>Presence of other co – morbidities</b>		
	Yes	168	66.4
	No	85	33.6
9	<b>Levels of capillary blood glucose</b>		
	Less than 150 mg / dl	103	40.7
	More than 200 mg / dl	150	59.3

The severity of depression among the study subjects is given in Figure 1. Among the subjects who had depression, it found that 56 (71.8%) of them had mild form of depression while 12 (15.4%) had moderate depression and 10 (12.8) of them had moderately severe forms of depression.

In this study the prevalence of depression among the study subjects was found to be 78 (30.8%). The association between the factors and the presence of depression are given in Table 2, in which the prevalence of depression was more among the females compared to males. Also the proportion of depression among illiterates and the graduates were found to be higher. Personal habits such as smoking and alcohol influence the depression which is identified by the higher prevalence among them.

**Figure 1: Severity of Depression among study participants (N=78)**



**Table 2: Association between the Risk Factors and Depression (N = 253)**

Sr. No.	Factors	Depression Present		Depression Absent		Chi Square Value	p Value
		n (78)	(%)	n (175)	(%)		
1.	<b>Age in years</b>					4.995	0.172
	Less than 45 years	9	47.3	10	52.7		
	45 - 55 years	41	26.4	114	73.6		
	56 - 65 years	24	36.9	41	63.1		
	Above 65 years	4	28.5	10	71.5		
2.	<b>Gender</b>					4.776	0.028*
	Male	39	25.6	113	64.4		
	Female	39	38.6	62	41.4		
3.	<b>Education status</b>					11.6426	0.020*
	Illiterate	7	41.1	17	58.9		
	Primary education	8	20	32	80		
	Secondary education	15	22.3	52	73.7		
	Higher secondary education	18	31.5	39	68.5		
	Graduate & above	30	46.1	35	53.9		
4.	<b>Socio - economic class</b>					5.0707	0.167
	Lower middle class	7	31.8	15	68.2		
	Middle class	14	30.4	32	69.6		
	Upper middle	13	20.3	51	79.7		
	Upper	44	57.1	77	42.9		
5.	<b>Consumption of Alcohol</b>					30.6767	0.000*
	Yes	39	57.3	29	42.7		
	No	54	29.1	131	70.8		
6.	<b>Smoking</b>					24.2127	0.000*
	Yes	40	52.6	36	47.4		
	No	44	24.8	133	75.2		

7.	<b>Duration of Diabetes</b>				2.2971	0.187	
	Less than 5 years	29	25.8	83			74.2
	More than 5 years	49	34.7	92			65.3
8.	<b>Presence of co-morbidities</b>				1.4694	0.178	
	Yes	56	33.3	112			66.7
	No	22	25.8	63			74.2
9.	<b>Capillary blood glucose levels</b>				2.1182	0.145	
	Less than 150 mg / dl	35	37.6	58			62.4
	More than 200 mg / dl	43	28.6	107			71.4

### Discussion:

In the present study, the prevalence of depression among the type 2 diabetes patients was found to be 30.8%. Similar studies conducted by Aminu A et al and Roupa Zet al<sup>[12,13]</sup> in the primary care settings showed nearly the prevalence of 30 – 35 %.

With regard to age, there is no significant association between age and depression. Similar finding was found in other studies conducted in India.<sup>[14-19]</sup> This clearly indicates that there is no age predilection to develop depression among the diabetes. It was found in the present study that, depression was more common in females than the males. Studies conducted by Aminu A et al,<sup>[12]</sup> Nasser J et al,<sup>[20]</sup> and Agbir TM et al<sup>[16]</sup> noted that female diabetic patients were more prone to develop depression. This could be due to the gender specific problems like menstrual cycle changes, pre and post menopause and additional stresses like taking care of children.

With reference to educational status, it was found that those with higher educational status had more risk of developing depression when compared to others. This finding is comparable to the studies conducted in Southi Arabia by AlBekairy A et al.<sup>[21]</sup> However, this could be because the literates outnumbered the other educational groups in this study.

Depression was found to be more among smokers (52.6%) and among those who consumed alcohol (57.3%) than among the non – smokers and those who did not consume alcohol and this difference was highly significant. It is essential to create awareness among the diabetes patients about the need of cessation of substance abuse in order to improve the quality of life.

Percentage of depression was more among those having diabetes for more than 5 years, but the

difference was not statistically significant. These finding is consistent with similar studies conducted in India.<sup>[14-19]</sup> There was no significant association between the presence of co-morbidities and the depression.

With regard to the blood glucose levels which were recorded in the last 3 weeks, it was found that among those with the high capillary blood glucose levels, the prevalence of depression was high, however this difference was not statically significant. The findings were similar to that found in the studies conducted by Raval A et al<sup>[14]</sup> and Thour A et al.<sup>[18]</sup>

### Limitations:

Since it is not a community based study, the results cannot be generalized. Also the causal association of alcohol and smoking with depression cannot be established.

### Conclusion:

The prevalence of depression among type 2 diabetes patients was 30% and it was found that gender, educational status, consumption of alcohol and the habit of smoking seemed to play a significant role. Hence it is important to screen for the depression in type 2 diabetes patients in NCD clinics and to emphasize the counseling services which could help in the effective management of both disorders.

### Declaration:

Funding: Nil

Conflict of Interest: Nil

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