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Original article

# Prevalence of depression in patients of type 2 diabetes mellitus: A cross sectional study in a tertiary care centre

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ABSTRACT

*Aims:* The present study aims to study the prevalence of depression in patients with uncomplicated type II diabetes mellitus and to find its association with various socio-demographic factors in the same.
*Materials and methods:* A cross-sectional, single interview study was performed in an outpatient department of an endocrinology institute. Total 80 type II DM patients without any associated complications of diabetes were included in this study. To diagnose Depressive Episode, structured clinical interview for DSM V was applied. Severity of depression was assessed by Hamilton Rating Scale for Depression (HAM-D). To assess socio-demographic characteristics of the patients, all of them were evaluated with a semi-structured socio-demographic performa.
*Results:* 38.75% patients (N = 31) were found to be suffering from depression. Among them 48.38% were moderately depressed and none were suffering from very severe depression. Significant association was not found between depression and socio-demographic factors of age (p = 0.920), gender (p = 0.251), economic profile (p = 0.583), local background of the patient (p = 0.646), educational qualification (p = 0.935) and marital status (p = 0.644). Similarly no association was found with duration of diabetes, HbA1c and BMI.
*Conclusion:* Exclusion of complicated cases didn't seem to influence overall prevalence of depression, although reduction in severity was apparent. Thus even in those diabetic patients who are leading a complication free life, a detailed psychiatric analysis to rule out depression is mandatory.


## 1. Introduction

Diabetes mellitus (DM) is a chronic disease resulting from defects in either insulin secretion or insulin action, or sometimes both. It has been classified as type 1 DM and type2 DM. Type 2 DM is a heterogeneous group of disorders characterized by variable degree of insulin resistance, impaired insulin secretion and increased glucose production [1]. The total number of diabetic patients has increased from 171 million to 366 million and the estimated prevalence is higher in men than in women [2].

India is expected to be the leading country with estimated prevalence of 79.4 million by 2030 [3]. India has more than 50 million Type 2 diabetes patients [4]. The prevalence of type 2 DM among the urban population of India is estimated to vary between 8 and 15% with a gradually increasing trend of urbanization [5].

Depression is a disorder of major public health importance in terms of its prevalence and the suffering, dysfunction, morbidity and economic burden. The World-wide estimated prevalence of Depression is 25%. Depressive disorders are more in women than men. Life time prevalence of depression is 10–20% [6].

Depression and diabetes share a bidirectional causal association. Depression has been postulated to play a causal role in emergence of diabetes [7]. Co-occurrence of diabetes and depression has been established in clinical as well as general population studies [8]. This co-occurrence is associated with increased impairment as well as mortality [9]. Emergence of depression in diabetes is associated with increased complications, mortality rates, and healthcare costs [10–12]. Data on this association is mostly from west and few researchers from India have worked in this direction. More data is available from South India and there has been a dearth of work on North Indian population. It is important to know how common depression is in diabetes and its relationship with the socio-demographic and co-

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morbid factors so that effective measures can be taken to diagnose and treat it for adequate glycaemic control.

## 2. Materials and methods

The present study is part of a larger cross- sectional study carried out in the Department of Physiology, Jawaharlal Nehru Medical College, A.M.U., Aligarh, in collaboration with Department of Psychiatry, J.N.M.C.H., A.M.U. and Rajiv Gandhi Centre For Diabetes and Endocrinology, Faculty Of Medicine, A.M.U., Aligarh, from July 2014 to June 2015. This study was approved by the institutional ethical review board. Subjects were taken from the out patient department of Rajiv Gandhi Centre For Diabetes and Endocrinology, Faculty of Medicine, J.N.M.C.H., A.M.U., Aligarh, a tertiary care centre. Informed consent was taken from all the patients before participating in the study. Inclusion and exclusion criterias were laid.

Inclusion criteria

1. Diagnosed cases of type 2 DM
2. Patients between 30 and 65 years of age with adequate cognitive functions to perform the interview.
3. Duration of T2DM 1–10 years.

Exclusion criteria

1. Patients who have previous history suggestive of depression or have received any form of psychiatric treatment (pharmacological or non-pharmacological).
2. Patients with co-morbid history of cerebrovascular accident, ischaemic heart disease or other debilitating conditions.
3. Patients with complications of diabetes.
4. Patients with family history of depression and presence of any other coexisting medical condition that could affect the function of nervous system or taking drugs (except for the drugs used for the management of diabetes) which is known to cause depression.

The patients were evaluated on a semi structured performa which includes patient's particulars, socio- demographic characteristics, diabetes mellitus history and other medical history. Brief History related to diabetes was taken which included duration of DM and osmotic symptoms, treatment received for diabetes, history suggestive of peripheral neuropathy, autonomic neuropathy, nephropathy, retinopathy, peripheral vascular disease, coronary artery disease and foot ulcers. Addiction to alcohol or other substances were recorded. Socioeconomic status was recorded which included educational attainment, income of the patient and family, and whether belonging to urban or rural. A detailed physical examination including peripheral pulses and Blood Pressure was done. To objectively assess the clinical states of the patients, HbA1c levels that shows long-term blood glucose control were measured on the day of interview. Anthropometric measurements: Standing body height (to the nearest 0.1 cm) was measured with a commercial stadiometer. A digital scale, with an accuracy of ± 100 g, was used to measure body weight (BW). The measurements were taken thrice and the mean was taken as the final reading. Body mass index (BMI) (kg/m2) was calculated by dividing weight (in kilograms) by the square of height (in meters), as a measure of total adiposity.

The diagnosis of depression was established by Structured Clinical Interview for DSM V Axis-1 Disorders. The severity of depression will be measured by HAM-D 17 (Hamilton Depression Rating Scale, 1960, 1967, 1980). HAM-D is a widely used, 17-item, clinician-rated scale designed to assess the severity of depression.

## 3. Statistical analysis

All statistical analysis was done by using SPSS version 20 (SPSS Inc., Chicago, USA). Continuous variables were expressed as mean ± standard deviation. Chi square test and Fisher exact test were used to compare qualitative data. Independent samples *t*-test was applied to compare the means. Mean standard deviation was calculated for quantitative data. All p values were two tailed and values of $p < 0.05$ were considered statistically significant.

## 4. Results

Among the study participants, 31 patients met the DSM-V diagnostic criteria for major depressive episodes, whereas 49 patients did not have a major depressive episode in the past 1 month. Among the depressed group, 32.25% were mildly depressed ($N = 10$), 48.38% were moderately depressed ($N = 15$), 19.35% had severe depression ($N = 6$) and none had very severe depression according to the HAM-D scale (refer Table 1). Mean age of the depressed group was 50.90 ± 7.73 years and that of the non-depressed group was 48.88 ± 9.54 years. The difference in the age of both groups was not statistically significant ($t = 0.993$, $P = 0.301$).

The study population was equally distributed gender wise (males = 40, females = 40) and this was not planned. Of the males, 13(32.5%) were depressed and 27(67.5%) were not depressed and in females 18(45%) were depressed and 22(55%) were not. Although depression was more prevalent in female age group, gender was not found to be significantly associated with depression ($p = 0.920$). Majority of the patients in our study were from urban locality [urban = 64(80%), rural = 16(20%)]. 37.5% of the urban (N = 24) and 46% of the rural patients were depressed (N = 7). The association between locality of patients and depression was not significant ($p = 0.646$).

Majority of the patients (N = 66, 80%) were from lower middle income category which was the dominant group in our study population. Here also the association of economic profile with depression was not significant ($p = 0.58$). Our study population largely constituted of higher educated participants with 46.3% (N = 37) of the subjects having an educational background of graduation and above. Like with other socio-demographic factors educational background also didn't seem to influence depression significantly ($p = 0.935$). The association of marital status with depression was also not significant ($p = 0.644$) although married patients tend to have higher propensity for depression (40%) than unmarried ones (20%). Above mentioned socio-demographic findings are summarized in Table 2.

The mean duration of DM in the depressed and non-depressed groups was 4.58 ± 2.12 years and 4.62 ± 2.83 years, respectively. The difference in the duration of diabetes between groups was statistically insignificant ($t = -0.70$, $P = 0.940$). Mean HbA1c levels were 8.60 ± 1.57 and 8.18 ± 1.82 in the depressed and non-depressed groups, respectively, and the difference between groups was also not significant ($t = -1.089$, $P = 0.265$). Mean BMI value in depressed group was 28.74 ± 4.57 whereas in the normal group it was 28.24 ± 4.77. Although mean BMI was greater in depressed

**Table 1**
Severity of depression.

| Severity of depression | Count | Percentage (%) |
|---|---|---|
| Mild | 10 | 32.25 |
| Moderate | 15 | 48.38 |
| Severe | 6 | 19.35 |
| Very severe | 0 | 0 |
| Total | 31 | 100 |

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