Original Research Article

Prevalence of psychiatric morbidity (depression) and its effect on drug compliance among patients attending diabetic outpatient clinic

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Abstract

Background: Depression, a common mental disorder characterized by persistent unhappiness and lack of interest in daily activities, is one of the major important public health problems that are often comorbid with other chronic diseases like diabetes and can worsen the effect of the disease outcomes. Depression alone and/or as a comorbidity with diabetes is a common condition in the community.
Aim of the study: To identify the prevalence of Depression among Type 2 Diabetes Mellitus patients and relationship between Depression and its effect on Drug Compliance among Type 2 Diabetes Mellitus patients, to determine the severity of Depression among Type 2 Diabetes Mellitus patients and the extent to which it affects Drug compliance.
Materials and methods: The study was to be conducted in Rajah Muthiah Medical College and Hospital, Chidambaram in the year 2018-2019. A hundred patients with diagnosis of T2DM attending Diabetic OPD above 20 years of age were randomly selected. The Hamilton rating scale for depression by Hamilton is the most widely used rating scale to assess the symptoms of depression. The Ham-D is an observer-rated scale consisting of 17-21 items. Ratings are based on clinical interview. The items are rated on either a 0 to 4 spectrum or a 0 to 2 spectrum. The HAM-D also relies quite heavily on the clinical interviewing skills and the experience of rater in evaluating individuals with depressive illness. The strength of HAM-D is its excellent validation/research base,

and case of administration. Its use is limited in individuals who have psychiatric disorders other than primary depression.

Results: Analyzing with HAMD score, 40 had no depression, mild depression in 24 cases, moderate depression in 21 cases, severe depression in 15 cases. MAQ score scale- low adherence in 41 cases, medium adherence in 37 cases, high adherence in 22 cases. MMAQ score scale and HAMD score- low adherence with no depression were 9 cases (22.5%) mild depression were 6 cases (25%) moderate were 11(52.4%) severe depression were 15 cases (100%). MMAQ score scale and HAMD score - medium adherence with no depression were 23 cases (57.5%) mild depression were 9 cases (37.5%) moderate were 5(23.8%) severe depression were not seen. MMAQ score scale and HAMD score - Medium adherence with no depression were 8 cases (20%) Mild depression were 9 cases (37.5%) Moderate were 5(23.8%) severe depression was not seen. Pearson Chi-Square = 35.344**, $p<0.001$.

Conclusion: Further, there was a significant association between the depression in Type 2 diabetes patients and medication adherence, where patients with depression had poor medication adherence as compared to those without depression and severity of depression correlates with worse adherence to diabetic medications.

Key words

Diabetes Mellitus, HbA1c -Glycated Hemoglobin, Depression, MAQ score scale.

Introduction

Diabetes mellitus is a chronic metabolic disorder characterized by hyperglycemia with disturbances of carbohydrate, protein, and fat metabolism [1]. The global prevalence of diabetes has been increasing rapidly. In 2017, the overall global prevalence of diabetes among adult is 8.5%. In addition, according to world health organization report globally around 170 million people are affected by diabetes and this figure is more likely to be double by 2030. In 2015, an estimated 1.6 million deaths were directly caused by diabetes [2]. Today, the burden of diabetes remains one of the major and important public health problems in India which have been resulting in high mortality and morbidity [3]. Depression, a common mental disorder characterized by persistent unhappiness and lack of interest in daily activities, is one of the major important public health problems that are often comorbid with other chronic diseases like diabetes and can worsen the effect of the disease outcomes [4]. Depression alone and/or as a comorbidity with diabetes is a common condition in the community. The cause of depression in patients with diabetes may be associated with the burden of complications, financial stress, poor overall health status, knowledge of diabetes, and poor glycemic control [5]. The presence of depression in diabetic patients worsens the prognosis of diabetes, increases the noncompliance to the medical treatment, decreases the quality of life, and increases mortality. Moreover, the burden of depression in patients with diabetes is linked with increased diabetes complications, high mortality rates, and poor quality of life [6]. The few studies conducted in India have shown that the coexistence of diabetes and depression is highly prevalent in which depression was found to remain as an important comorbid condition with diabetes [7]. Additionally, depression is highly prevalent among diabetes patients and associated with a number of debilitating conditions such as the presence of diabetic complications, comorbidity, and the disease duration [8]. Even then, few studies conducted on the prevalence of depression among diabetic patients in various parts of India presented controversial and inconclusive findings [9]. Despite the huge effect of comorbid depression and diabetes and its importance as a public health problem in India, the overall prevalence of depression among diabetes patients in the

country level remains unknown. In addition, measuring depression alone or as comorbidity in patients with diabetes promotes the overall health status, avoids negative effects of depression, and even may prevent diabetes-related complications [10].

Materials and methods

The study was to be conducted in Rajah Muthiah Medical College and Hospital, Chidambaram in the year 2018-2019. A hundred patients with a diagnosis of T2DM attending Diabetic OPD above 20 years of age were randomly selected. The Hamilton rating scale for depression by Hamilton was the most widely used rating scale to assess the symptoms of depression. The Ham-D was an observer-rated scale consisting of 17-21 items. Ratings were based on a clinical interview. The items were rated on either a 0 to 4 spectrum or a 0 to 2 spectrum. The HAM-D also relies quite heavily on the clinical interviewing skills and the experience of rater in evaluating individuals with depressive illness. The strength of HAM-D was its excellent validation/research base, and case of administration. Its use is limited in individuals who have psychiatric disorders other than primary depression.

Inclusion criteria

Patients of both sexes were included, patients above 20 years of age, patients with a diagnosis of Type 2 Diabetes Mellitus with minimum 1-year duration, patients with the absence of any prior psychiatric illness.

Exclusion criteria

Patients with other severe medical illnesses who cannot participate, Patients with severe cognitive impairment, Patients not consenting for the study, patients with severe mental illness who cannot be interviewed.

Method of interview with patients

Patients with a diagnosis of T2DM attending Diabetic OPD were randomly selected and the nature of the study and its objectives were explained to the patient and their relatives. Written informed consent was obtained from the patients as well as family members. The assessment was conducted in a single session lasting for an hour. The assessment was completed over a period of six months of follow up and retrospectively from the register.

Materials used [11, 12]

- Self-innovated proforma to elicit the Socio-Demographic data
- Hamilton Rating Scale For Depression (HAM-D)
- Morisky Medication Adherence Questionnaire (MMAQ – 8)
- ICD – 10 criteria for Mental Disorders (WHO)

Diagnostic criteria

F32.0 Depressive episode (ICD 10 guidelines)

In typical depressive episodes of all three varieties (mild – F32.1, moderate F32.2, and severe F32.2 and F32.3) the individual usually suffers from depressed mood, loss of interest and enjoyment, and reduced energy leading to increased fatiguability and diminished activity. Marked tiredness after only slight effort is common. Other common symptoms are:

a. Reduced concentration and attention
b. Reduced self-esteem and self-confidence
c. Ideas of guilt and worthlessness
d. Bleak and pessimistic view of future
e. Ideas or acts of self-harm or suicide
f. Disturbed sleep
g. Diminished appetite

The lowered mood varies little from day to day, and is often unresponsive to circumstances, yet may show a characteristic diurnal variation as the day goes on. As with manic episodes, the clinical presentation shows marked individual variations, and atypical presentations are particularly common in adolescence. In some cases, anxiety, distress, and motor agitation may be more prominent at times than the depression, and the mood change may also be masked by added features such as irritability, excessive

consumption of alcohol, histrionic behavior, and exacerbation of pre-existing phobic or obsessional symptoms, or by hypochondriacal preoccupations. For depressive episodes of all three grades of severity, a duration of at least 2 weeks is usually required for diagnosis, but shorter periods may be reasonable if symptoms are unusually severe and of rapid onset. Some of the above symptoms may be marked and develop characteristic features that are widely regarded as having special clinical significance. The most typical examples of these "somatic" symptoms are: loss of interest or pleasure in activities that are normally enjoyable; lack of emotional reactivity to normally pleasurable surroundings and events; waking in the morning 2 hours or more before the usual time; depression worse in the morning; objective evidence of definite psychomotor retardation or agitation (remarked on or reported by other people); marked loss of appetite; weight loss (often defined as 5% or more of body weight in the past month); marked loss of libido. Usually, this somatic syndrome is not regarded as present unless about four of these symptoms are definitely present.

Procedure

A total of hundred cases were selected consecutively from patients who fulfilled the inclusion and exclusion criteria and recruited for the study. They were explained about the study and consent was obtained. Then the Self innovated proforma was filled and details about the patients were obtained. HAM-D and MMAQ scales were administered and scored, for the level of psychiatric morbidity among them and medication adherence among those with psychiatric morbidity. The prevalence was then compared with certain variables and associations if any was found.

Statically analysis

All data were entered and analyzed using Statistical Program for Social Sciences (SPSS) version 12.0 (SPSS Inc., 2018). For the studies that provided data solely on diabetic samples, the prevalence of depression was computed using the event-rates (ER), centered at 0.00 with 95% confidence intervals. Furthermore, meta-regression analyses were performed to illustrate the possible effect of age and/or gender on the strength of the association between diabetes and depression and/or anxiety. The continuous variables were described in mean and standard deviation (SD) while frequency and percentages were used for categorical variables. Simple logistic regression was used as screening in the selection of variables for further analysis.

Results

In this study, there were hundred participants with mean age to be 53.64 years and standard deviation to be 12.04 years. In the present study 37% of the participants were in the age group of 41 - 50 years, 20% of them were between the age group of 51-60 years and 35% of them were above 60 years of age. Very few of the participants were below 40 years and above 70 years and they were found to be 5% in each age group respectively. Most of the participants 53% were males remaining 47% were females and most of the participants 93% of them were married.54 were substance abusers, 46 had no substance abuse (**Table – 1**).

In 100 cases 11 had family history of psychiatric morbidity (depression) and 89 had no family history of psychiatric morbidity. <1 year - 29 cases, 1-5 years - 30 cases, 6-10 years - 28 cases, Above 10 Years -13 cases (**Graph – 1**).

Graph - 2 shows Compliance was Good - 24 cases, Fair - 26 cases, Poor - 40 cases.

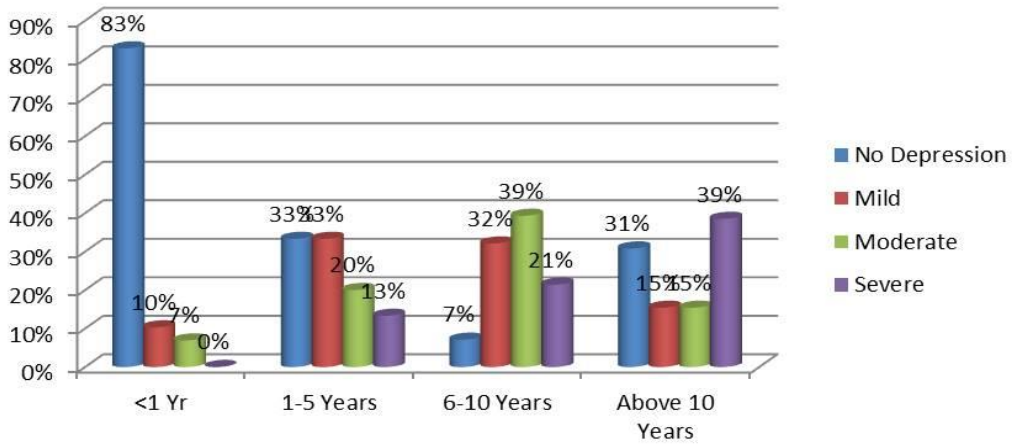
No Comorbidity - 37, with comorbid SHTN - 43, With comorbid, IHD - 8, With both SHTN & IHD – 12 (**Graph – 3**). Analyzing with HAMD SCORE, 40 had no depression, mild depression in 24 cases, moderate depression in 21 cases, severe depression in 15 cases (**Graph – 4**).

MMAQ score scale - Low adherence in 41 cases, Medium adherence in 37 cases, High adherence in 22 cases (**Graph – 5**).

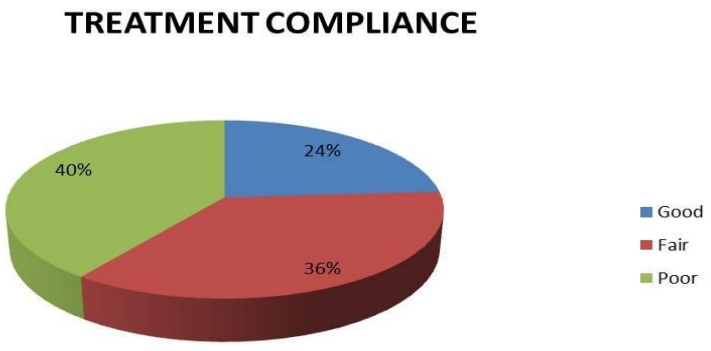
Table – 1: Association between socio-demographic variables with depression.

		Depression						
		Absent		Present				
		Count	Column N %	Count	Column N %	OR	Chi square	P value
Age	<50	21	52.5%	24	40.0%	1.66	1.515	.218
	>50	19	47.5%	36	60.0%			
Sex	Male	22	55.0%	31	51.7%	1.14	.107	.744
	Female	18	45.0%	29	48.3%			
Location	Rural	18	45.0%	31	51.7%	0.77	.427	.514
	Urban	22	55.0%	29	48.3%			
Education	Illiterate	19	47.5%	22	36.7%		1.250	.535
	School	8	20.0%	16	26.7%			
	Above School	13	32.5%	22	36.7%			
Marital status	Married	39	97.5%	54	90.0%	4.33	2.074	.150
	Unmarried	1	2.5%	6	10.0%			
Socio-economic status	Lower	24	60.0%	28	46.7%	1.71	2.113	.348
	Middle	12	30.0%	21	35.0%			
	Upper	4	10.0%	11	18.3%			

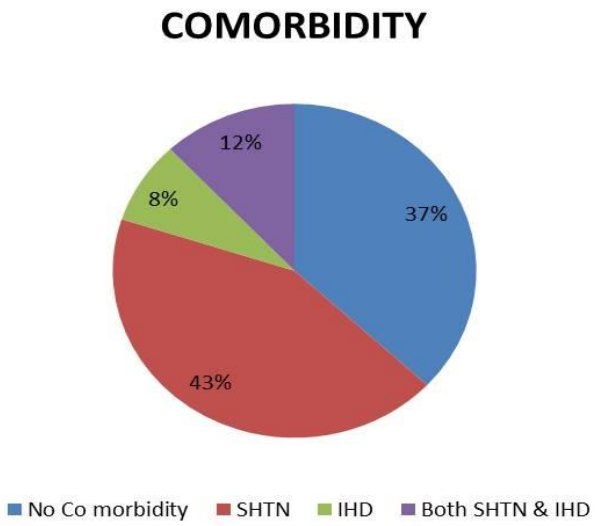
Graph – 1: Duration of illness correlation with HAMD score.



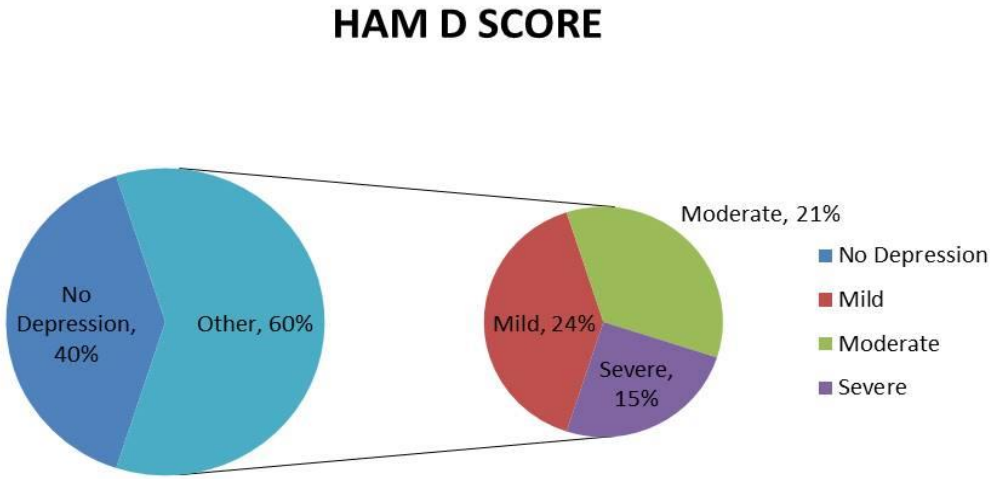
Graph – 2: Treatment compliance.



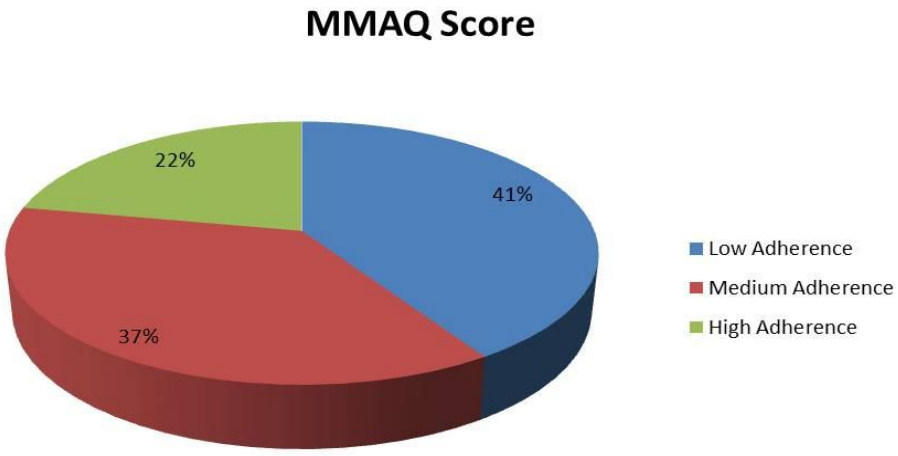
Graph – 3: Comorbid medical conditions.



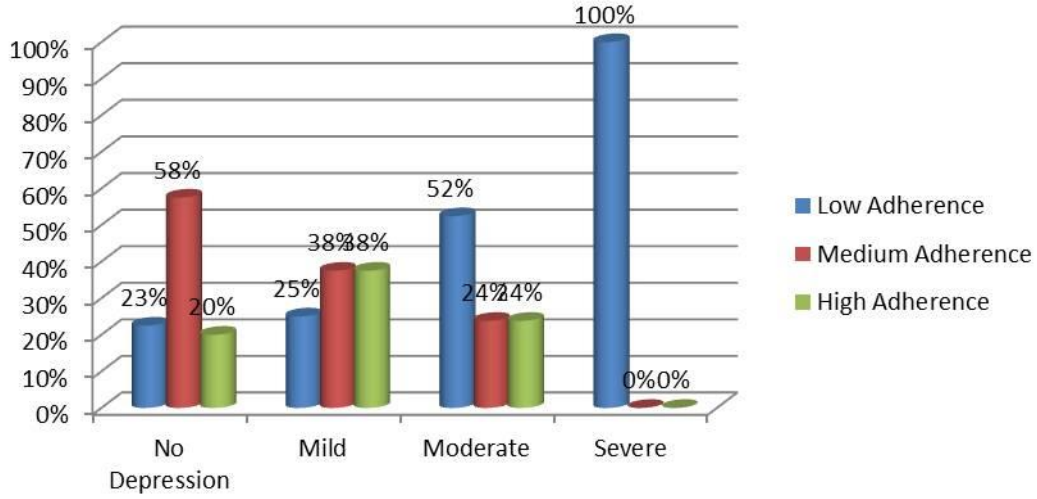
Graph – 4: HAMD score.



Graph – 5: MMAQ score scale.



Graph – 6: Correlation between MMAQ score and HAM-D score.



MMAQ score scale and HAMD score - low adherence with no depression were 9 cases (22.5%) mild depression were 6 cases (25%) moderate were 11(52.4%) severe depression were 15 cases (100%). MMAQ score scale and HAMD score - medium adherence with no depression were 23 cases (57.5%) mild depression were 9 cases (37.5%) moderate were 5(23.8%) severe depression were not seen. MMAQ score scale and HAMD score - medium adherence with no depression were 8 cases (20%) mild depression were 9 cases (37.5%) moderate were 5(23.8%) severe depression were not seen. Pearson Chi-Square = 35.344**, p<0.001 (**Graph – 6**).

Discussion

Higher rates of depression have been found frequently in patients with several medical conditions, such as myocardial infarction, DM, human immunodeficiency virus (HIV)-related illness, cancer, cerebrovascular accident, Parkinson's disease, etc. [11]. The progressive functional impairment associated with many chronic medical illnesses may result in depression, and depression is associated with additive decrements in function. Increasing evidence indicates that both depressive symptoms and MDD may be associated with increased morbidity and mortality from conditions such as DM and heart disease [12]. The adverse effect of depression on health habits (smoking, unhealthy diet, and sedentary lifestyle), its negative impact on adherence to medical regimens, as well as direct adverse physiologic effects (i.e., decreased heart rate variability, increased adhesiveness of platelets) may explain this association with higher morbidity and mortality rates [13]. Numerous studies have also shown that a positive family history of depression is associated with an increased risk of the condition in offspring. Although it is likely that part of that effect is genetic, it has also been reported that even after controlling for the familial effect, little parental socio-economic status (low level of education and occupational status) increases the risk of offspring depression [14]. Additionally, trauma in early life, including childhood physical or sexual abuse, has been strongly connected with the occurrence of depression in adult life Depression severity was associated with non-adherence in a gradient manner: 15% of non-depressed, 29% of mildly depressed, and 37% of moderately to severely depressed patients were non-adherent [15]. The study determined that severely depressed patients were 3.7 times more likely to be non-adherent than non-depressed patients after controlling for potential confounders. Furthermore, adherence increased in patients whose depressive symptoms improved, and it decreased in patients whose depressive symptoms worsened [16]. Brown C T, et al. conducted on a representative sample (n =

21,847) of the urban population aged 30 to 69 years in nine large cities between 1986 and 1988, showed that the prevalence of DM was 7.6 and that of impaired glucose tolerance 7.8%, without significant differences between genders. However, the DM prevalence in the 60-69-yr age-group was 17.4 %. More recently, between 1996 and 1997, another cross-sectional study conducted in South India found that the overall rates of diabetes and impaired glucose tolerance were 12.1 and 7.7%, respectively, while the rates for the 60-69 year age group were 21.7% and 11.3%, respectively. A recent meta-analysis of longitudinal studies indicated that depressed adults have a 37% increased risk of developing type 2 diabetes. The findings of such meta-analysis have also suggested that depression could be considered as an additional risk factor for T2DM, even comparable in size to physical inactivity and smoking [17]. Conversely, another meta-analysis showed that diabetes doubles the odds of comorbid depression Furthermore, some studies have indicated that depression may cause a negative impact on glycemic control (which may result in an increased occurrence of complications and disability), and improvements in depressive symptoms may lead to a significantly better diabetic control. On the other hand, better glycemic control in patients with type 2 diabetes may result in a better mood and general well-being, and fewer physical symptoms. It has been estimated that depression is neither recognized nor treated in approximately two-thirds of subjects with both the conditions and also presents a chronic and severe course in these patients [18]. Additionally, this co-morbidity has been associated with higher health care costs and the implementation of more effective depression screening programs and depression treatment for patients with diabetes might lead to a decreased economic burden and better clinical outcomes [19]. The increased risk of depression among individuals with diabetes has been frequently conceptualized as having two possible mechanisms. First, the psychosocial burden of having a chronic medical condition like diabetes may promote the development of depressive symptoms. It has been observed that when the burden of diabetes increases, the probability of mood symptoms also increases [20]. Perceived disability and awareness of having a chronic disease such as diabetes may impose higher levels of psychological stress, especially among those with poor social support. Additionally, diabetes requires high levels of self-care (proper medication management, strict dietary regimens, frequent monitoring of blood glucose values), may generate medical complications and decreased mobility, which can contribute to a negative psychological impact. Second, biochemical factors associated with diabetes may also result in an increased risk of depression [21]. However, a recent intervention study conducted among 26 non-diabetic Pakistani women with newly diagnosed depression showed a significant improvement of insulin sensitivity following the treatment of depression with citalopram (a type of SSRI that has not shown significant effects on insulin sensitivity or changes in glycemic control). A meta-analysis published in 2008 showed that subjects with T2DM have a 15% increased risk of depression compared to those without diabetes, and depressed people have a 60% increased risk of developing T2DM [22]. Additionally Checkley S, et al. also identified a bidirectional longitudinal association between depressive symptoms and T2DM. In this study, individuals with normal glucose levels and elevated depressive symptoms were at an increased risk for developing T2DM over three years, whereas those with T2DM and little depressive symptomatology at baseline were at an increased risk of developing depressive symptoms over the same period.All the data collected are likely to contribute to the development of strategies to prevent diabetes, depression and possibly cardiovascular diseases as well [23]. New approaches for the treatment of diabetes may be developed by including the treatment of depression for possible improved glycemic control [24]. Timely treatment and strategies to prevent complications applied to the participants who were diagnosed with diabetes, depression and/or another medical condition may reduce morbidity, mortality and lifelong

complications. Furthermore, the results of this study may add some important knowledge to the general understanding of the relationship between diabetes and depression, which in turn may lead to better management of both the conditions; and they may also give grounds to the development of new hypotheses for exploration and new management and preventive guidelines [25].

Conclusion

There was a significant difference between those with and without family h/o depression with the former group showing significant association with increased risk for depression. The presence of comorbid medical conditions like Systemic Hypertension and Ischemic Heart Disease was shown to have a significant association with the prevalence of depression among Type 2 diabetes mellitus patients. Also duration of illness was significantly associated with depression, with longer the duration of illness, stronger is the association with depression, further complicating the scenario as disease such as Type 2 diabetes mellitus runs a chronic course.Further there was a significant association between the depression in Type 2 diabetes patients and medication adherence, where patients with depression had poor medication adherence as compared to those without depression and severity of depression correlates with worse adherence to diabetic medications.

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