Original article

Depression among diabetic patients: a cross sectional study

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Summary

The risk of depression is doubled by diabetes which is often overlooked. The aim of the cross-sectional study was to find out the proportion of depression and its connection with socio-demographic differences among diabetic patients attending in the outpatient and inpatient departments of Bangladesh Institute of Research and Rehabilitation in Diabetes, Endocrine and Metabolic Disorders (BIRDEM) hospital and the endocrine outpatient department as well as medicine inpatient department of Bangabandhu Sheikh Mujib Medical University (BSMMU) from November 2006 to September 2007. Through consecutive sampling, 390 patients suffering from diabetes for at least one year, above 18 years of age, were included in the study. A semi-structured questionnaire to collect socio-demographic and other relevant information, the Global Health Questionnaire 12 items (GHQ 12) for screening of psychiatric manifestation, and diagnostic and statistical manual for mental disorder (DSM) IV TR diagnostic criteria to diagnose psychiatric disorders were used. The results showed that, out of 390 respondents, 106 patients (27.2%) had depression. An association with co-occurring depression was observed in female, low level of education, low socioeconomic condition, farmers, students, housewives, unmarried, divorced and patients having family or past history of psychiatric disorders. The findings of this study will help to draw adequate attention from physicians in this issue while treating diabetic patients.

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Introduction

Depression is a mental state characterized by a feeling of sadness, loneliness, despair, low self-esteem, and self-reproach; while accompanying signs include psychomotor retardation or at times agitation, withdrawal from the interpersonal contract, and vegetative symptoms, such as insomnia and anorexia.[1] Diabetes mellitus (DM) is a clinical syndrome characterized by hyperglycemia due to absolute or relative deficiency of insulin.[2] Both the diagnosis is highly prevalent and they have high relation. Risk of depression doubles by the presence of diabetes compared to those without the disorder.[3] Depression can develop because of stress but also may result from the metabolic effects of diabetes on the brain.[4] The chances of becoming depressed increase as diabetes complications worsen. Depression leads to poorer physical and mental functioning, so a person is less likely to follow a required diet or medication plan. Studies suggest that people with diabetes who have a history of depression are more likely to develop diabetic complications than those without depression. People who suffer from both diabetes and depression tend to have higher health care costs in primary care.[4] In people who have diabetes and depression, psychotherapy and antidepressant medication have positive effects on both their mood and blood sugar control.[3] Despite these, depression often remained undiagnosed and untreated. People with diabetes, their family and friends, and even their physicians may not distinguish the symptoms of depression. So, the study was done to find out the hospital prevalence of depression among diabetic patients and to find out the socio-demographic differentials of the patients having DM with depression and without depression. The study findings will help to reduce the disease burden of diabetic patients, to improve liaison psychiatric services, and to disseminate information to the policymakers to launch an intensive effort to manage diabetes and depression.

Materials and methods

This cross-sectional study was conducted in the outpatient department (OPD) and inpatient department of Bangladesh Institute of Research and Rehabilitation in Diabetes, Endocrine and Metabolic Disorders (BIRDEM) hospital along with the endocrine OPD and inpatient of medicine department of Bangabandhu Sheikh Mujib Medical University (BSMMU) from November 2006 to September 2007. Diabetic patients suffering for at least one year, above 18 years of age, and attending the

above-mentioned study places were included. The patients who were mute, stupor, non-communicable, did not give consent, had a history of recent bereavement, had severe co-morbid diseases like malignancy, and who were taking medications that can produce depression were excluded. Thus, a total of 390 diabetic patients were selected through convenience sampling techniques and interviewed. Among them, 334 patients were from BIRDEM and 56 patients were from BSMMU. After getting informed written consent from the patients, the face to face interview was conducted by using a semi structured questionnaire containing socio-demographic parameters and relevant information about depression and diabetes. Then validated Bangla version of the Global Health Questionnaire 12 items (GHQ 12) was used for all patients to screen for psychiatric manifestation. All screen-positive cases (GHQ 12 score 2 or more) and every 4th of GHQ screen negative case were assessed clinically by one or two psychiatrists who were blind about the purpose of the study and GHQ 12 score. The diagnostic criterion for depression of the diagnostic and statistical manual for mental disorder (DSM) IV TR was used for diagnosis. Data were analyzed by computer with the statistical package for social sciences (SPSS) 12. Statistical analyses were done to measure the level of significance by using an appropriate statistical tool like the chi-square test (between separate groups) and student t test, where applicable. Statistical significance is set at 0.05 level and confidence interval at 95% level.

Results

Out of all patients, 172 (55.9%) patients were found GHQ 12 positive while 106 of them had depression. That means 27.2% of total patients and 61.6% of GHQ 12 positive patients were suffering from depressive illness. The subjects found to have depression and the rest of the total research population were compared on various occasions. The mean age of patients with depressive illness was 45.5 (±11.77) years and that of patients without depressive illness was 50.99 (±11.17) years. Depression was mostly found (54.5%) in the 20-30 years age group while people in the 51-60 years age group had the lowest rate (18.8%) which was statistically significant (p value <0.05) (Table 1).

In both groups number of male patients was more than female. But female patients were found more depressed than male patients (40.9% versus 22.9%) and the difference was statistically significant (p value <0.05). Between both groups' majority of the respondent lived in the urban area but depression was found significantly more among the patients living in rural areas. The difference was statistically significant (p value <0.05) (Table 2).

Table 1: Age distribution of the diabetic patients (n=390)

Age (in years)	Diabetes with depression Frequency (%)	Diabetes without depression Frequency (%)	p value*
20-30	12 (54.5)	10 (45.5)	0.003
31-40	22 (27.5)	58 (72.5)	0.942
41-50	37 (35.6)	67 (64.4)	0.025
51-60	22 (18.8)	95 (81.6)	0.015
61+	13 (19.4)	54 (80.6)	0.116
Total	106 (27.2)	284 (72.8)	0.001
Mean±SD	45.5±11.77	50.99±11.17	0.001**

*Chi-square test was done to measure the level of significance. The test was done between separate age groups; **Unpaired t test was done to measure the level of significance.

Table 2: Socio-demographic covariates (sex, marital status, religion, residence) of the diabetic patients (n=390)

Characteristics	Diabetes with depression Frequency (%)	Diabetes without depression Frequency (%)	p value*
Sex			
Male	68 (22.9)	229 (77.1)	0.001
Female	38 (40.9)	55 (59.1)	
Marital status			
Unmarried	06 (42.9)	08 (57.1)	0.062
Married	93 (26.3)	260 (73.7)	
Divorced	02 (100)	00 (0.0)	
Widow	05 (23.8)	16 (76.2)	
Religion			
Muslim	101 (27.9)	161 (72.1)	0.250
Hindu	05 (17.9)	23 (82.1)	
Residence			
Urban	66 (23.7)	212 (76.3)	0.016
Rural	40 (35.7)	72 (64.3)	

* Chi-square test was done to measure the level of significance.

Among the diabetic patients with depression, there were more housewives followed by service holders, farmers, and retired people. Among diabetic patients without depression, service holders were followed by housewives. But depression was found more among farmers (62.5%) followed by unemployed people (50.0%), students (50.0%), and housewives (38.5%). The difference in having depression was found statistically significant among farmers, day laborers, and service holders. The majority of the respondents were belonging to middle socioeconomic status in both case and non-case groups but depression was found more among the people having lower socio-economic status and it was found significantly low in number among the upper socio-economic population ($p < 0.05$) (Table 3).

Significantly more respondents of the diabetic patients with depression had a history of psychiatric illness. The difference between the diabetic patients with depression and without depression was statistically significant ($p < 0.05$) (Table 4).

Depression was more among diabetic patients who suffered for 11 to 15 years. However, diabetic patients who suffered for 16 years or more were less in number to have depression (Table 5).

Depression was more among the diet, exercise, oral medication and insulin treatment group followed by the only diet and exercise treatment group, but the difference was not found statistically significant ($p=0.131$) (Table 6).

Table 3: Socio-demographic covariates (education, occupation, religion, residence, economic condition) of the respondent (n=390)

Characteristics	Diabetes with depression Frequency (%)	Diabetes without depression Frequency (%)	p value*
Education			0.061
No education	34 (34.3)	65 (65.7)	0.064
Primary level	19 (35.8)	34 (64.2)	0.127
SSC level	21 (21.0)	79 (79.0)	0.107
HSC level	16 (28.6)	40 (71.4)	0.800
Graduation or above	16 (19.5)	66 (80.5)	0.079
Occupation			0.061
Unemployed	05 (50.0)	05 (50.0)	0.100
Student	03 (50.0)	03 (50.0)	0.205
House wife	35 (38.5)	56 (61.5)	0.006
Farmer	15 (62.5)	09 (37.5)	0.000
Day laborer	00 (0.0)	14 (100.0)	0.000
Businessmen	08 (17.0)	39 (83.0)	0.095
Service	16 (16.2)	83 (73.1)	0.004
Retired	14 (26.9)	38 (71.2)	0.964
Others	10 (21.3)	37 (78.7)	0.332
Economic condition (monthly income)		0.001	
< 5000 BDT	03 (9.7)	28 (90.3)	0.000
5000-15000 BDT	60 (22.2)	210 (77.8)	0.001
> 15000 BDT	43 (48.3)	46 (51.7)	0.022

* Chi-square test was done to measure the level of significance.

Table 4: Illness history of diabetic patients (n=390)

Characteristics	Diabetes with depression Frequency (%)	Diabetes without depression Frequency (%)	P value*
Family history of psychiatric illness	12 (11.3)	23 (8.1)	0.322
Past psychiatric history	03 (2.8)	01 (0.4)	0.031
Past history of medical illness	26 (24.5)	67 (23.6)	0.847

* Chi-square test was done to measure the level of significance.

Table 5: Duration of diabetes and presence of depression in diabetic patients (n=390)

Duration of diabetes	Depression		Total
	Present (%)	Absent (%)	Frequency (%)
1-5 years	53 (25.5)	155 (74.5)	208 (100)
6-10 years	22 (24.2)	69 (75.8)	91 (100)
11-15 years	26 (40)	39 (60)	65 (100)
16+ years	05 (19.2)	21 (80.8)	26 (100)

Chi-square value=6.946, df=3, p value=0.074

Table 6: Relationship between treatment pattern and depression in diabetic patients (n=390)

Treatment	Depression		Total
	Absent (%)	Present (%)	Frequency (%)
Only diet and exercise	15 (71.4)	06 (28.6)	21 (100)
Diet, exercise and oral medication	152 (75.3)	50 (24.7)	202 (100)
Diet, exercise and insulin	78 (75.7)	25 (24.3)	103 (100)
Diet, exercise, oral medication and insulin	39 (60.9)	25 (39.1)	64 (100)

Chi-square value=5.628, df=3, p value=0.131

Discussion

This cross-sectional study on 390 diabetic patients was carried out in the outpatient and inpatient departments of BIRDEM and BSMMU from November 2006 to September 2007 to find out the prevalence of depression among diabetic patients in tertiary care hospitals of Bangladesh. Several socio-demographic characteristics of diabetic patients were compared between the patients who had depression and those who had not. Among all respondents, 55.9% of patients were found GHQ-12 positive. This reflects that more than 50% of diabetic patients had some sort of anxiety, feeling of strain, depression, inability to cope, lack of confidence, and other psychological problems. 61.6% of GHQ-positive patients in this study were found to have depression, which actually refute that, GHQ is a good instrument for screening depressive patients from the general population.

Among all respondents 27.2% had depression but the prevalence of major depressive disorder in the general population in Bangladesh is 4.6%.[8] The effect of diabetes may be the cause of the increased number of depressive patients. Because diabetes is a chronic condition requiring prolong medical supervision and informed self-care, psychological and social problems may be caused by a restriction of diet and activity, the need for self-care, and the possibility of serious physical complications such as vascular diseases and impaired vision.[9] This result is comparable with the study where they mentioned that the depression rate in diabetic patients was 24%.[10] In a series conducted by Asgar et al., also found a similar pattern of result with newly recognized diabetics among the rural population of Bangladesh. They found depressive symptoms among 29% of participants.[11] A range of 8.5-27.3% was found in a study conducted by Gravid et al.[12]

In this study, the mean age of the case group was 45.5 (±11.17) and the non-case group was 50.99 (± 11.17) years. It means that young populations were suffering more from depression. The probable explanation of this finding is that young people are not mentally prepared for chronic diseases like diabetes which restricts one's activity and productivity, and also sexual life. Nearly three times more rate was found among young diabetics in a study.[13] But this result is not similar to a study done in a rural community of Bangladesh among the newly recognized diabetics, where depressive score increased with increasing age.[10,11]

In both groups (case and non-case) number of male patients was more than females though the incidence of diabetes is essentially equal in women and men in all populations. It reflects that male patient attend the hospitals more in number for treatment and females do not get that priority. It has previously been postulated that in Bangladesh female patients usually do not seek treatment as readily as males which reflects the attitude and stressors of the society towards female sufferers. Gender discrimination is still a noticeable issue in this country though there is no statutory basis for it. In this series, female patients were found more depressed than male patients. This difference was statistically significant ($p < 0.05$). The reasons for the difference have been hypothesized to be hormonal differences, the effect of childbirth, different psychological stressors for women, and behavioral models of learned helplessness.[14] The similar result was found in a study where female diabetic patients were more prone, nearly double, to depression than male diabetic patients.[13] Another study stated that people with diabetes, with

co-morbid depression, were more like to be women.[15]

The majority of the respondents were married in both case and non-case groups. It is interesting to note that divorced and widowers were negligible in number. Several explanations can be put forward. Firstly, this study was carried out in hospitals that need at least some cost, which may not be affordable by those who are usually poor. Secondly, in the absence of adequate social support, the divorced and widowers, who were usually older cannot come to the hospital and consequently remain underrepresented. A similar observation was found in a study done in the National Institute of Mental Health, Dhaka, Bangladesh.[16] They found 59.4% cases were married and 34.4% are unmarried. In this study, depression was found (100%) among patients among divorced followed by unmarried (42.09%), married (26.3%) and widow (23.8%). The difference was statistically not significant ($p = 0.062$). The possible explanation might be that major depressive disorder occurs most often in persons without close interpersonal relationships or those who are divorced or separated.[14] Unmarried single life with diabetes also causes stress because diabetes is a chronic disease and it would affect to make a new relationship with the opposite sex. The majority of the respondents were Muslim in both case and non-case groups. Bangladesh is a Muslim majority country; consequently, Muslim participants were high in this study.

Data was collected from the tertiary care hospital of central Dhaka so maximum respondents were from urban areas in both case and non-case groups. Similar findings were found in a previous study, where 60.7% of respondents lived in urban and 39.3% in rural areas[16]. In this study, depression was found significantly more ($p = 0.016$) among the patients living in rural areas than in urban areas (35% vs. 23.7%) which was comparable to epidemiological data.[16]

Depression was found more in the lower socioeconomic group and less in the upper socio-economic population, which is similar to a study in the USA, where major depressive disorder was nearly three times as likely among those who had an income less than the federal poverty level of USA.[13]

A very small number of patients had a past history of psychiatric illness and a family history of psychiatric illness. This does not mean that psychiatric disorders were less prevalent. Maybe cases were not identified or treated. No statistically significant difference was found between depression and length of diabetes and treatment regimen of diabetes. This may be due to the small sample size and further study with a large sample size is needed to draw an inference about this.

Conclusion

From the present study, it can be concluded that depression among diabetic patients should be a major concern for diabetic patients as well as for treating physicians. Therefore, adequate attention should be paid to this aspect while treating diabetic patients.

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