Assessment of Psychiatric Morbidity among the Type 2 Diabetes Mellitus Patients Attending at Outpatient Department of a Peripheral Military Hospital in Bangladesh

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Abstract

Background: Among the major noncommunicable diseases (NCDs), morbidity and mortality from Diabetes makes the largest contribution worldwide. As a disease, Diabetes Mellitus (DM) is not only a public health threat by itself but also troublesome in concomitant comorbid psychiatric conditions.

Objective: To assess the psychiatric morbidity in terms of anxiety and depression among the Type 2 diabetes Mellitus (T2DM) patients.

Methods: It was a cross-sectional study conducted among purposively selected 184 previously diagnosed T2DM patients from January 2023 to April 2023 attending at the outpatient department (OPD) of Combined Military Hospital (CMH) Ghatail. Face-to-face interview was done for the collection of data using pretested semi-structured questionnaire.

Results: Anxiety was revealed among the respondents significantly ($p<0.05$) more likely from married, retired and homemaker, monthly income between 7001-20000 taka, reside in a semi-pucca house, duration of diabetes >8 years and having symptoms of diabetes during diagnosis. Depressed respondents were significantly ($p<0.05$) more likely from age group between 45-55 and >56 years, married respondents, having monthly income between 70001-20000, being with nuclear family, residing in kancha house, age of onset of DM is >46 years with duration of DM >8 years and having symptoms of DM during diagnosis.

Conclusion: The study revealed that the relatively higher magnitude of depression and anxiety were found among the T2DM patients reported to the out-patient department of CMH Ghatail.

Keywords: Psychiatric morbidity, Depression, Anxiety, Outpatient department, CMH.

Introduction

Diabetes mellitus is responsible for the largest contribution to morbidity and mortality among all major types of non-communicable diseases (NCDs) worldwide.[1] As a global epidemic, diabetes mellitus affects nearly 382 million people worldwide which will likely to increase by 55% and by the year 2035, it is predicted to reach more than 592 million. Among others, China, India and the USA contributes to three-fourths of all patients with diabetes.[2] International Diabetic Federation (IDF) estimates that in 2019, nearly 463 million adults of age range between 20-79 were living with DM which representing about 9.3% of the global population and by the year 2030 and 2045, it will be increases up to 10.2% (578 million) and 10.9% (700 million) respectively.[3] In the recent years, both rural and urban Bangladesh experienced an increased prevalence of diabetes mellitus. Recent statistics revealed that the prevalence of T2DM in Bangladesh varied from 4.5% to 35.0%. According to IDF, at present nearly 7.1 million people suffering from diabetes in Bangladesh and almost an equal number of lives with undetected diabetes which is estimated to be double by 2025 and will be 13% by 2030.[1]

As a disease, DM is not only a public health threat by itself but also troublesome in concomitant comorbid psychiatric conditions.[4] The complications of T2DM may varied from both short (e.g., hypoglycemia) and long term (e.g., cardiovascular disease, neuropathy, nephropathy, and retinopathy) situations. Among many, it has been seen with various previous studies that T2DM patients are most commonly affected with psychological disorders like depression and anxiety.[5]

According to American Psychiatric Association Diagnostic and Statistical Manual of Mental Disorders (DSM-5), depression can be defined as "a mood disorder with numerous symptoms that affect the functionality of patients". While anxiety can be described as "an uncomfortable feeling of vague fear or apprehension accompanied by characteristic physical sensations".[6] So far, the most investigated disorder with T2DM is depression, with a meta-analysis indicating that people with diabetes are two-fold more likely to be diagnosed with depression as compared to people who do not have diabetes.[7].

Various counter-regulatory hormones like catecholamine, glucocorticoids, growth hormones and glucagon are activated during any psychological stress and interferes the action of insulin.

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As a result, insulin failed to lower the blood glucose rather it elevates it thereby maintenance of metabolic control become challenging. Ultimately, because of the poor glycemic control and functional impairment of insulin, depression and anxiety may worsen in patients with T2DM.[8]

Worldwide, the prevalence of depression and anxiety disorders is higher among persons living with diabetes compared to those without diabetes.[9] As per the recent hypothesis, due to increased blood sugar and lack of sensitivity of cells to insulin is responsible for the development of depression in patients with T2DM and it may be caused by two ways: firstly, by its effect on symptoms (e.g., lethargy and poor concentration) and compilations and secondly, by physiological mechanisms like inflammatory processes and by decreased neurotrophic function that leads to reduced plasticity of nervous system and then to depression.[10]

Patients with T2DM encountered anxiety disorders which make up one of the most common groups of psychiatric disorders. Recent comorbidity study reported that diagnostic criteria for anxiety disorder is prevalent in one of four persons. Among others, gender, age, education, diabetes complications and poor glycemic control were related to anxiety and depression in people with T2DM. As a result of diabetes related anxiety and depression, various negative health outcomes like increased complications related to DM, increased physical morbidity, higher blood glucose levels, poor quality of life and premature death occurs, as compared with depression or anxiety alone.[11]

In Bangladesh, epidemiological estimates on the assessment of psychiatric morbidity in terms of depression and anxiety among diabetics is very few. As a result, there is no comprehensive planning, implementation and evaluation of a depression management intervention program for the T2DM patients in the primary care setting. This study was carried out with the aims of assess the psychiatric morbidity in terms of depression and anxiety among Type II diabetic outpatients attending a peripheral military hospital.

Materials and Methods

This cross-sectional study was conducted from January 2023 to April 2023 at the outpatient department (OPD) of CMH Ghatail. Previously diagnosed 184 T2DM patients were purposively selected and included in this study with an aim to assess the psychological morbidity of DM in terms of anxiety and depression. Data were collected through face-to-face interview using a pretested questionnaire. Prior to data collection, informed written consent was obtained from the respondents. The study instrument comprised a semi-structured questionnaire which includes demographic and diabetes-related information. Respondent's anxiety and depression were assessed through General Anxiety Disorder (GAD) 7 and Patient Health Questionnaire (PHQ) 9

respectively. To measure the generalized anxiety disorder (GAD), the seven-item self-administered patient questionnaire (GAD-7) were used. The respondents rated the severity of their symptoms over the past two weeks. Each item is scored on a four-point Likert scale category of "0 for not at all, 1 for several days, 2 for more than half the days and 3 for nearly every day" respectively with total scores ranging from 0 to 21 with higher score reflecting greater severity. Scores above 10 were considered to be in the clinical range.[12] The PHQ-9 consists of nine items on a 4-point Likert scale. The PHQ-9 is a widely used screening tool, with recommended cut-off scores of 10 or greater being found to have 88% sensitivity and 88% specificity for a diagnosis of major depression.[13,14] Cronbach's alpha coefficient of GAD 7 and PHQ 9 were 0.82 and 0.79 respectively. Data processing and analyses were done using SPSS v23. Frequencies, percentage, mean and standard deviation (SD) were used for descriptive statistics. Chi-square test was performed to estimates the relationship between psychiatric morbidity with sociodemographic attributes of the diabetic patients. A two-tailed $p < .05$ was considered statistically significant.

Results

Majority (57.1%) of the respondents were male, highest (40.4%) belongs to the age group between 41-55 years with average (±SD) age was 49.30 years (±12.98) years and range was 24 to 87 years, equally (29.9%) qualified to SSC and HSC degree and 93.5% were married. Highest (42.9%) were house wife followed by 35.3% of retired respondents. More than one-third i.e., 41.3% of the respondents had monthly income between 70001 to 20000 Taka with an average (±SD) of 18473.91 (±14283.06) Taka. Minimum monthly family income was 1000 and maximum was 60000 Taka. More than half (59.8%) of the respondents belonged to the nuclear family with 56.0% had the family members >5 and 58.7% stayed at rural location. Sixty-nine percent of the respondents were non-smoker and 45.7% were overweight (Table-I).

In regards to the DM related attributes, 40.4% respondents became diabetic at the age group between 36-45 years with average (±SD) age of onset was 42.80 (±11.04) and minimum age was 22 and maximum was 84 years. Thirty eight percent respondents had been suffering from diabetes for <3 years which was followed by >8 years (33.7%) with average (±SD) duration was 6.51 (±5.35) years. Majority i.e., 78.8% respondents were diagnosed as a case of diabetes at the government hospital and rest (21.2%) were in the private hospital. More than half (51.6%) of the respondents took Oral Hypoglycemic Agents (OHA) along with diet control and physical exercise for the treatment of diabetes and 53.3% of them were regular in taking their treatment of diabetes. Forty three percent respondents had typical symptoms of diabetes during their diagnosis and 35.9% was diagnosed incidentally during routine checkup. Near about half i.e., 45.1% respondents had hypertension as comorbidity (Table-II).

Among the 184 respondents, 39.1% and 65.2% were above the cutoff point for the anxiety and depression respectively indicating the presence of mild to severe/extremely severe anxiety and depression (Table-III).

In regards to the anxiety, respondents were significantly more likely from married (χ^2=6.93, p=0.00), retired and homemaker (χ^2=4.76, p=0.05), monthly income between 7001-20000 taka (χ^2=16.43, p=0.00), reside in a semi-pucca house (χ^2=7.55, p=0.02), duration of diabetes >8 years (χ^2=10.63, p=0.00)

and having symptoms of diabetes during diagnosis (χ^2= 7.73, p=0.02). Depressed respondents were significantly more likely from age group between 45-55 and >56 years (χ^2=8.29, p=0.01), married respondents (χ^2=6.85, p=0.00), having monthly income between 70001-20000 (χ^2=35.20, p=0.00), being with nuclear family (χ^2=4.53, p=0.03), residing in kancha house (χ^2=9.82, p=0.00), age of onset of DM is >46 years (χ^2=6.51, p=0.03) with duration of DM >8 years (χ^2=6.26, p=0.04) and having symptoms of DM during diagnosis (χ^2=8.65, p=0.01) (Table-IV).

Table-I: Sociodemographic characteristics of the respondents (n=184)

Attributes	Frequency (%)	Attributes	Frequency (%)
Gender			
Male	105 (57.1)	**Type of family**	
Female	79 (42.9)	Nuclear	110 (59.8)
Age group in years		Joint	74 (40.2)
<40	53 (28.8)	**Family member group**	
41-55	75 (40.4)	<4	81 (44.0)
>56	56 (30.8)	>5	103 (56.0)
Mean (±SD)	49.30 (±12.98)	Mean (SD)	5.08 (1.70)
Min – Max	24 – 87	Min – max	1 – 12
Educational Qualification		**Place of residence**	
Primary	21 (11.4)	Urban	28 (15.2)
Up to class eight	55 (29.9)	Rural	108 (58.7)
SSC	55 (29.9)	Sub-urban	48 (26.1)
HSC and above	53 (28.8)	**Type of residence**	
Marital status		Pucca	82 (44.6)
Married	172 (93.5)	Semi-pucca	102 (55.4)
Widow/widower	12 (6.5)	**Smoking habit**	
Occupation		Non-smoker	128 (69.6)
Govt. service	40 (21.7)	Ex-smoker	35 (19.0)
Retired	65 (35.3)	Smoker	21 (11.4)
House Wife	79 (42.9)	**Body mass index**	
Monthly family income in taka		Normal	100 (54.3)
<7000	51 (27.7)	Over weight	84 (45.7)
7001-20000	76 (41.3)		
>20001	57 (31.0)		
Mean (±SD)	18473.91 (±14283.06)		
Minimum – maximum	1000 – 60000		

Table-II: Diabetes related attributes of the respondents (n=184)

Attributes	Frequency (%)	Attributes	Frequency (%)
Age of onset of DM (years)		**Place of first treatment of DM**	
<35	46 (28.8)	Govt. hospital	145 (78.8)
36-45	63 (40.4)	Private hospital	39 (21.2)
>46	75 (30.8)		
Mean (±SD)	42.80 (±11.04)	**Type of current treatment of DM**	
Min – Max	22 – 84	Oral Hypoglycemic Agents (OHA)	42 (22.8)
Duration of DM (years)		Diet control, physical exercise and OHA	95 (51.6)
<3	70 (38.0)	Diet control, physical exercise, OHA and insulin	47 (25.6)
4-7	52 (28.3)	**Nature of DM treatment**	
>8	62 (33.7)	Regular	98 (53.3)
Means (±SD)	6.51 (5.35)	Irregular	86 (46.7)
Min-Max	1-30	**Comorbidity with DM**	
Mode of diagnosis of DM		Hypertension	83 (45.1)
Incidentally	66 (35.9)	Smoking	57 (31.0)
Symptoms of DM	79 (42.9)	Previous mental illness	01 (0.5)
Routine checkup	39 (21.2)		

Table-III: Distribution of anxiety and depression (n=184)

Attributes	Frequency	Percentage
Anxiety		
No Anxiety	112	(60.9)
Having Anxiety	72	(39.1)
Depression		
No depression	64	(34.8)
Having depression	120	(65.2)

Table-IV: Association between various attributes of the respondents with anxiety, depression and wellbeing score (n=184)

Attributes	State of anxiety		State of Depression	
	No Anxiety (%)	Having Anxiety (%)	No Depression (%)	Having Depression (%)
Gender				
Male	64 (34.8)	41 (22.3)	34 (18.5)	71 (38.6)
Female	48 (26.1)	31 (16.8)	30 (16.3)	49 (26.6)
χ^2	0.001		0.62	
p value	0.91		0.43	
Age group in years				
<40	37 (20.1)	16 (8.7)	23 (12.5)	30 (16.3)
41-55	46 (25.0)	29 (15.8)	30 (16.3)	45 (24.5)
>56	29 (15.8)	27 (14.7)	11 (6.0)	45 (24.5)
χ^2	3.73		8.29	
p value	0.15		0.01*	
Educational qualification				
Primary	12 (6.5)	9 (4.9)	07 (3.8)	14 (7.6)
Up to class eight	32 (17.4)	23 (12.5)	14 (7.6)	41 (22.6)
SSC	33 (17.9)	22 (12.0)	19 (10.3)	36 (19.6)
HSC and above	35 (19.0)	18 (9.7)	24 (13.0)	29 (15.8)
χ^2	0.90		4.71	
p value	0.82		0.19	
Marital status				
Married	109 (59.2)	63 (34.2)	64 (34.8)	108 (58.7)
Widow/widower	3 (1.6)	9 (4.9)	00 (0.0)	12 (6.5)
χ^2	6.93		6.85	
p value	0.00*		0.00*	
Occupation				
Service	30 (16.3)	10 (5.4)	17 (9.2)	23 (12.5)
Retired	35 (19.0)	30 (16.3)	17 (9.2)	48 (26.1)
Home maker	47 (25.5)	32 (17.4)	23 (16.3)	49 (26.6)
χ^2	4.76		3.54	
p value	0.05*		0.17	
Monthly income in taka				
<7000	22 (12.0)	29 (15.8)	7 (3.8)	44 (23.9)
7001-20000	44 (23.9)	32 (17.4)	20 (10.9)	56 (30.8)
>20001	46 (25.0)	11 (6.0)	37 (20.1)	20 (10.9)
χ^2	16.43		35.20	
p value	0.00*		0.00*	
Family type				
Nuclear	71 (38.6)	39 (21.1)	45 (24.5)	65 (35.3)
Joint	41 (22.3)	33 (17.9)	19 (10.9)	55 (29.9)
χ^2	1.55		4.53	
p value	0.21		0.03*	
No of Family member				
<4	54 (29.3)	27 (14.7)	31 (16.8)	50 (27.2)
>5	58 (31.5)	45 (24.5)	33 (17.9)	70 (38.0)
χ^2	2.04		0.78	
p value	0.15		0.37	
Type of residence				
Pucca	54 (29.3)	24 (13.0)	17 (9.2)	11 (6.0)
Kancha	4 (2.2)	0 (0.0)	33 (17.9)	75 (40.8)
Semi-pucca	54 (29.3)	48 (26.1)	14 (7.6)	34 (17.5)
χ^2	7.55		9.82	
p value	0.02*		0.00*	

Smoking habit				
Non-smoker	80 (43.5)	48 (26.1)	49 (26.6)	79 (42.9)
Ex-smoker	18 (9.8)	17 (9.2)	9 (4.9)	26 (14.1)
Smoker	14 (7.6)	7 (3.8)	6 (3.3)	15 (8.2)
χ^2	1.75		2.32	
p value	0.41		0.13	
Age at onset of DM in years				
<35	29 (15.8)	17 (9.2)	19 (10.3)	27 (14.7)
36-45	40 (21.7)	23 (12.5)	27 (14.7)	36 (19.6)
>46	43 (23.4)	32 (17.4)	18 (9.9)	57 (31.0)
χ^2	0.67		6.51	
p value	0.71		0.03*	
Place of first diagnosis of DM				
Govt. hospital	85 (46.2)	54 (29.3)	49 (26.6)	90 (48.9)
Private hospital	24 (13.0)	18 (9.8)	13 (7.1)	29 (15.8)
Doctors chamber	3 (1.6)	0 (0.0)	2 (1.1)	1 (0.5)
χ^2	2.18		1.68	
p value	0.33		0.44	
Duration of DM in years				
<3	53 (28.8)	17 (9.2)	32 (17.4)	38 (20.7)
4-7	28 (15.2)	24 (13.0)	16 (8.7)	36 (19.6)
>8	31 (16.8)	31 (16.8)	16 (8.7)	46 (25.0)
χ^2	10.63		6.26	
p value	0.00*		0.04*	
Mode of diagnosis of DM				
Incidentally	39 (21.2)	27 (14.7)	22 (12.0)	44 (23.9)
Symptoms of DM	42 (22.8)	37 (20.1)	21 (11.4)	58 (31.5)
During routine examination	31 ()16.8	8 (4.3)	21 (11.4)	18 (9.8)
χ^2	7.73		8.65	
p value	0.02*		0.01*	

Discussion

Combined Military Hospital Ghatail is a 300 bedded secondary hospital located at Shaheed Salahuddin Cantonment. Everyday a good number of entitled armed forces personnel (serving and retired) including their families reported at its OPD for their physical problems. This hospital provides all sorts of treatment appropriate for the nature of physical problems including advanced diagnostic facilities. From the OPD, we selected previously diagnosed 184 T2DM patients purposively to get the study related information with an aim to assess their psychological morbidity in terms of anxiety and depression. As a result, similar sociodemographic characteristics were observed with the existing rules and regulations of Bangladesh armed forces which is dissimilar from the national average to some extent.

Both sexes were included in this study whose mean age was 49.30 (±12.98) and majority belonged to 41-55 years. Almost similar observation was noted by Srivastava AS et al[15], Coker et al[16], Xu L et al[17], Das R et al[18], Einstein A et al.[19] we also revealed that majority of the respondents were male, equally educated up to class eight and secondary school certificate examination, having rural inhabitants and reside in semi-pucca house. All these findings is consistent with the study conducted by Srivastava AS et al[16], Ismail M et al.[20] At the same time most of the respondents in their study[19] belonged to nuclear family which is similar to our study as well. We revealed that 93.5% of the respondents were married and 69.6% were non-smoker which is almost similar to the study conducted by Ismail M et al[20], Alajmani DS et al.[21]

In this study, the average (±SD) duration of T2DM was 6.51 (±5.35) years which is almost consistent with the study findings conducted by Aschner P et al[22], Alajmani DS et al.[21] In this study, 25.6% respondents were on insulin and oral hypoglycemic agent as their treatment which is not consistent with the study findings conducted by Alajmani DS et al[21] which may be due to regional variation, type of study and sample selection of the respondents.

We revealed that majority (45.1%) of the respondents had hypertension as a common comorbidity which is consistent with the study finding conducted by Aschner P et al[22] but dissimilar to the findings of the study conducted by Einstein A et al[19] and Alajmani DS et al.[21] In this study we revealed that 39.1% and 65.2% were above the cutoff point for anxiety and depression respectively indicating the presence of anxiety and depression among the respondents.

In regards to the diabetes associated depression, we compared our findings with other studies conducted in various parts of the world and found widely varied results in different countries and studies. The reported prevalence of

depression in T2DM was 10.6% in Taiwan, 11.5% in Malaysia, 13% in Addis Ababa, 14.7% in Pakistan, 18.6% in Brazil, 19.7% in Jordan, 23.2% in Vietnam, 38.8% in India, 40% in Palestine and 48% in Saudi Arabia.[21] A study conducted at Tanzania by Khan ZD et al[23] revealed almost similar findings as compared to our study. We also compared our findings with the findings of other countries and studies which shows that the presence of depression among T2DM patients was 43.5% in Pakistan, 40% in Palestine, 7.8% in Nigeria, 13–61% in Ethiopia, and 37% in Turkey.[21] This result of 65.2% depression in T2DM patients seem to show a much higher rate of depression compared to worldwide reports as revealed by a meta-analysis of 42 studies where it was found that approximately 20–40% of individuals with T2DM have comorbid depression.[24] This variation may be either due to the use of different research instrument for measurement of depression, various sociocultural, and behavioral-related factors among the study participants and also due to the use of different cutoff scores for diagnosing depression even with the same instrument.

In this study, statistically significant ($p<0.05$) relation was revealed among the respondents of age group between 45-55 and >56 years, married respondents, having monthly income between 70001-20000, being with nuclear family, residing in kancha house, age of onset of DM is >46 years with duration of DM >8 years and having symptoms of DM during diagnosis. All these findings were not in line with the study results from Aminu AS et al[4], Xu L et al[17] and Das R et al.[18]

In regards to the diabetes associated anxiety disorder; our findings were almost in line with the study results from Vanderlip ER et al[25] but dissimilar to the study findings from Srivastava AS et al[15], Coker et al[16], Xu L et al[17] and Ismail M et al.[20] The difference in prevalence of anxiety disorder in diabetic patients may be due to the difference in study instruments, type of study design and study respondents.

This study revealed that there was statistically significant relation between anxiety with married individual, retired and homemaker patients with monthly income between 7001-20000 taka, reside in a semi-pucca house, duration of diabetes >8 years and having symptoms of diabetes during diagnosis which is in line with the findings of the study conducted by Xu L et al.[17]

This study has several strengths. It was one of the first systemic study among the T2DM patients in an OPD of a peripheral CMH. Also the study maintained a good quality control as the data were collected by the researcher using a pre-tested questionnaire and conduct of face-to-face interviews from the T2DM patients, considerably large sample size and the respondents were included irrespective of sex. Despite this, this study is not free from several limitations as well which includes First, its lack of representativeness as the data were collected from an OPD of a CMH i.e., the results cannot be generalized. Second one its proneness to recall bias which is due to the fact that the data depended solely on the responses of the participants. Third, being a cross-sectional study, we did not observe the response longitudinally as we only evaluate the psychological morbidity of T2DM patients attending a peripheral military hospital. This study cannot give any tangible insight into temporal association or cause-effect relationship. Fourth, because of constrain in time, only questionnaire interview was conducted without any intervention. Finally, as the respondents were selected purposively so the possibility of selection bias may exist for the study.

Conclusion
Current study results showed that the magnitude of depression and anxiety were relatively high among T2DM patients. Many factors like middle and older age group with married respondent, having monthly income between 70001-20000 taka with age of onset of DM >46 years, duration of DM >8 years and having symptoms of DM during diagnosis showed significant relation with development of depression and anxiety. Periodic screening of patients with T2DM in primary healthcare settings for early signs of psychological distress using easy and inexpensive validated screening tools is recommended. At the same time, an integrated care model should be developed to manage these psychiatric morbidities associated with T2DM.

Acknowledgement

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