International Journal of Community Medicine and Public Health
Abhishek R et al. Int J Community Med Public Health. 2022 May;9(5):2200-2207
http://www.ijcmph.com
pISSN 2394-6032 | eISSN 2394-6040

DOI: https://dx.doi.org/10.18203/2394-6040.ijcmph20221241

Original Research Article

Assessment of mental health status among type 2 diabetics in urban field practice area of JSS Medical College, Mysuru

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Received: 13 March 2022
Accepted: 12 April 2022

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ABSTRACT

Background: To assess the mental health status and to determine the associated risk factors of mental health disorder among Type 2 diabetics residing in urban field practicearea of Department of community medicine, JSS Medical College, Mysuru.
Methods: Cross-sectional study was conducted in urban field practice area of Department of Community Medicine, JSS Medical College, Mysuru. Total 390 Diabetics were included in our study. Pre-designed, semi structured questionnaire and DASS 21 scale was used for data collection and the data was analyzed using Statistical package for social sciences (SPSS) 23 (Licensed to JSSAHER). P<0.05 was considered statistically significant.
Results: Prevalence of depression, anxiety and stress were 162 (41%), 126 (32.3%), 124 (31.8%) respectively. Age, education, tobacco chewing, history of hypertension were statistically significantly associated with depression. Age, occupation, hypertension were statistically significantly associated with anxiety. Age, education, occupation were statistically significantly associated with stress.
Conclusions: Depression, anxiety and stress among diabetics in our study is less. Age, education, occupation, history of hypertension were common factors associated with mental health status. Counselling should be done at regular intervals for all T2DM patients for better mental health well-being.

Keywords: Depression, Anxiety, Stress, Type 2 Diabetes mellitus, DASS 21

INTRODUCTION

Diabetes mellitus is a metabolic disorder characterised by hyperglycaemia and alteration in carbohydrate, lipid, and protein metabolism resulting by a partial or absolute lack of insulin secretion.[1] Type 2 Diabetes mellitus is expected to afflict around 246 million people across the world; however, prevalence varies by country. Diabetes and depression are extremely common illnesses which have a major impact on health outcomes all over the world. By 2030, the International Diabetes Federation estimates a 366 million increase, bringing the total of individuals with diabetes type 2 to 552 million.[2] Diabetes mellitus, which affect more than 110 million people in Asia, has become a growing public health concern. Larger population affluence in South Asia is associated which increases health-risk behaviours related to chronic diseases like heart disease, cancer, and diabetes. With a prevalence of more than 6% and rapidly growing in South Asia.[3]

According to International Diabetes Federation in 2010 the total prevalence of diabetes in India is 50.8 million persons and this is estimated to increase to 87 million by 2030.[4] The prevalence of Type-2 diabetes in India's urban population has been expected to occur from 8 to 15%, with a considerable upwards trend.[5]

Depression is common mental disorder. Sadness, lack of enthusiasm or pleasure, feelings of guilt or low self-

worth, interrupted sleep or food, weariness, and poor concentration are all symptoms of depression.[6] Women, unmarried, older age, low socio – economic status and a higher BMI are all risk factors associated with depression in diabetics. Smoking, an increased number of comorbidities, higher cholesterol, and poor glycemic control are also associated with depression. Depression among diabetic patients has been observed at various prevalence rates around the world, ranging from 59.8% to 50–60% in Asia, 54.1 % in Nepal, 45.2 % in Bangladesh, and 25.3–35.4 % in India.[7] In South Asia, a relationship between depression and diabetes has been identified. A hospital-based study in India revealed a prevalence of depression ranging from 8.5 % to 32.5 %.[3]

Diabetes, heart disease, and cancers are usually associated with depression, worsening the prognosis of these conditions and increasing the costs associated with their treatments. People with mental disorders live 10 years less than those without, and non-communicable diseases are the major cause of death.[8] It might be regarded of as a manageable risk factor for T2DM development and prognosis. When diabetes and depression coexist, the risk of complications, comorbidities, patient suffering, and related expenses increases. As compared to the general population, diabetics are approximately twice as likely to experience anxiety and sadness.[1]

Anxiety is defined as a feeling of worry, nervousness about something with an uncertain outcome; whereas stress is a state of mental or emotional strain resulting from adverse or demanding circumstances.[6] Among all the psychiatric disorders, anxiety is among the most common. Knowledge of disease-specific and nonspecific risk factors helps in the early identification of people who are at risk, which is critical for subsequent therapy.[9]

When a person knows that demands exceeds the resources deployed by the individual, stress is caused. Diabetes-related chronic hyperglycemia may be worsened by stress. For a long period of time, stress was shown to have a significant impact on metabolic activity.[10]

According to the evidence, diabetes, anxiety, and depressive disorders all appear to have bidirectional causality. Patients having anxiety symptoms have an increased chance of developing type 2 diabetes, and vice versa. Personal and family history, stressful life events, substance misuse, and a lack of physical exercise can all contribute to the development of anxiety problems in people with diabetes.[11] It's possible that diabetes and depression had comparable or similar etiologies, or that having one illness increases the likelihood of having the other. Family and personal history, stressful life events, domestic abuse, physical problems, and clinical factors are all significant risk factors of depression in diabetic patients.[10]

Based on this background, this study was planned to find out the prevalence of mental health disorder and associated risk factors among T2DM patients in the urban field practice area of Department of Community Medicine, JSS Medical College, Mysuru.

Objectives

To assess the mental health status among Type 2 diabetics residing in urban field practice area of Department of community medicine, JSS medical college, Mysuru. To determine the associated risk factors of mental health disorder among Type 2 diabetics.

METHODS

Study design

The study design was cross-sectional study.

Study place

Medar Block and Bannimantap areas of Mysuru was the study site.

Study duration

The study was conducted for 6 months.

Sample size

Based on the reported prevalence of depression among diabetic patients to be 47.9%, 4 with absolute precision of 5%, and a confidence interval 95% a minimum sample size of 383 needs to be studied. Considering 47.9% as prevalence with an absolute precision 5% and CI of 95%.

Substituting

P=47.9%
q=100-p=52.1

Allowable error r= 5%

$$Sample\ size = Z^2pq \div r^2$$

$$n = (1.96)2 \times 52.1 \times 47.9 \div 52 = 383$$

Rounded to 390

Sampling technique and study population

Previously diagnosed diabetes mellitus patients registered in JSS Urban Health Centre, Medar block and Urban Primary Health Centre, Bannimantap were considered. Purposive sampling method was used to select the study population. House to house survey was conducted to collect data.

Inclusion criteria

Subjects diagnosed to have diabetes and on treatment since last one year were included in the study.

Exclusion criteria

Type 1 diabetes mellitus patients. Those patients with severe cognitive impairment that could affect their response. Seriously ill patients. Previously diagnosed with mental illness.

Method of collection of data

Informed consent was taken from study participants. Type 2 Diabetics were interviewed by doing house to house visit, and the following tools was used for data collection which includes – predesigned and semi structured questionnaire was used to collect data about socio-demographic characteristics like family history, personal history, employment status etc. Depression Anxiety Stress Scale (DASS21) was used assess mental health status.

Data analysis

Data was be entered into MS excel followed by analysis using Statistical package for social sciences (SPSS) 23 (licensed to JSS AHER). The demographic characteristics such as age, sex etc. was represented using arithmetic mean, standard deviation and percentages. The bar diagrams and pie diagrams was also used for representing the socio–demographic characteristics. The prevalence of depression/anxiety/stress was be represented using proportions (DASS 21scale). The possible risk factors was found using chi-square test/fisher's exact test. $P<0.05$ was considered statistically significant.

RESULTS

In this study 70% were female and 30% were male participants. Among study samples majority were in the age group of 51 to 60 years about 33.3%, 376 (96.4%) were married, 39% were illiterate, 61.8% of study participants were unemployed.

About 77.2% were from joint families. Majority were belonging to a lower middle class with 46.4%, 11.5% were having the habit of smoking, 7.6 % were having the habit of betel leaf chewing, 6.4% had the habit of alcohol consumption and 5.38% were having the habit of tobacco chewing. Majority of the study participants had diabetes from 6 to 10 years. 1.8% were having Diabetic Complications. History of hypertension was present in 51.3% (Table 1).

Table 1: Basic characteristics of study participants (n=390).

Variable		Number	Percentage
Gender	Male	117	30
	Female	273	70
Age (years)	31-40	38	9.7
	41-50	97	24.9
	51-60	130	33.3
	61-70	108	27.7
	71-80	17	4.4
Marital status	Single	14	3.6
	Married	376	96.4
Education	Illiterate	152	39
	Lower school	13	3.3
	Middle school	95	24.4
	High School	78	20
	PUC	35	9
	Graduate	10	2.6
	Post graduate	7	1.8
Occupation	Unemployed	241	61.8
	Labour	56	14.4
	Agriculture	4	1.0
	Business	76	19.5
	Service	6	1.5
	Professional	4	1.0
	Retired	3	0.8
Socio economic status	Upper class	0	0
	Upper middle class	13	3.3
	Middle class	157	40.3
	Lower middle class	181	46.4
	Lower class	39	10
Addictive habits	Tobacco chewing	21	5.38

Continued.

Variable		Number	Percentage
	Betel leaf chewing	30	7.6
	Smoking	45	11.5
	Alcohol	25	6.4
Type of living	Nuclear	301	77.2
	Joint	87	22.3
	Three generation	2	0.5
History of substance abuse in family	Yes	94	24.1
	No	296	75.9
Duration of diabetes	1–5 years	100	25.6
	6–10 years	271	69.5
	11–15 years	17	4.4
	16-20 years	2	0.5
Diabetic complication	Yes	7	1.8
	No	383	98.2
History of hypertension	Yes	200	51.3
	No	190	48.7

Table 2: Prevalence of depression, anxiety, and stress among study participants (n=390).

DASS Scale		Number	Percentage
Depression	Mild	43	11.0
	Moderate	52	13.3
	Severe	39	10.0
	Extremely severe	28	7.2
Anxiety	Mild	27	6.9
	Moderate	44	11.3
	Severe	10	2.6
	Extremely severe	45	11.5
Stress	Mild	70	17.9
	Moderate	29	7.4
	Severe	19	4.9
	Extremely severe	6	1.5

Among study participants 11%, 13.3%, 10%, 7.2% had depression from mild moderate severe and extremely severe level respectively.

Extremely severe anxiety was present in 11.5%, 11.3% were having moderate anxiety, 6.9% were having mild anxiety and 2.6 % were having severe anxiety.

Mild stress was present in 17.9%, 7.4% were having moderate stress, 4.9% were having severe stress and1.5% were having extremely severe stress (Table 2).

In our study age, gender, marital status, education, occupation, socio economic status, type of family, Addictive habits, history of hypertension, duration of diabetes, diabetic complication were considered as risk factors.

Age, education, tobacco chewing, history of hypertension were statistically significantly associated with depression. Whereas occupation, socio economic status, duration of diabetes, diabetic complication had no statistical significant association with depression.

Age, occupation, hypertension were statistically significantly associated with anxiety. Whereas education, Socio economic status, tobacco chewing, Duration of diabetes, diabetic complication no statistical significant association with anxiety.

Age, education, occupation were statistically significantly associated with stress. But socio-economic status, tobacco chewing, duration of diabetes, history of hypertension, diabetic complication was no statistical significant association with stress (Table 3).

DISCUSSION

A total of 390 T2DM patients were included in the study. Among study participants 11%, 13.3%, 10%, 7.2% had depression from mild moderate severe and extremely severe level respectively.

Extremely severe anxiety was present in 11.5%, 11.3% were having moderate anxiety, 6.9% were having mild anxiety and 2.6% were having severe anxiety.

Mild stress was present in 17.9%, 7.4% were having moderate stress, 4.9% were having severe stress and 1.5% were having extremely severe stress.

Table 3: Association of risk factors with depression, anxiety and stress among study participants (n=390).

Variable	Depression		Anxiety		Stress	
	Yes N (%)	Chi square test	Yes N (%)	Chi square test	Yes N (%)	Chi square test
Age (years)						
31-40	24 (63.2)	$\chi2$=13.917 df =4 P=0.008	14 (36.8)	$\chi2$=9.795 df =4 P=0.044	18 (4.4)	$\chi2$=11.417 df =4 P=0.022
41-50	42 (43.3)		41 (42.3)		38 (39.2)	
51-60	56 (43.1)		35 (26.9)		39 (30)	
61-70	37 (34.3)		34 (31.5)		26 (24.1)	
71-80	3 (17.6)		2 (11.8)		3 (17.6)	
Education						
Illiterate	51 (33.6)	$\chi2$=17.462 df =6 P=0.008	37 (24.3)	$\chi2$=9.923 df =6 P=0.128	31 (20.4)	$\chi2$=26.907 df =6 P=0.000
Lower school	8 (61.5)		5 (38.5)		3 (23.1)	
Middle school	43 (45.3)		34 (35.8)		35 (36.8)	
High school	34 (43.6)		28 (35.9)		28 (35.9)	
PUC	22 (62.9)		17 (48.6)		22 (62.9)	
Graduate	1 (10)		3 (30)		3 (30)	
Post graduate	3 (42.9)		2 (28.6)		2 (28.6)	
Occupation						
Unemployed	99 (41.1)	$\chi2$=11.360 df =6 P=0.078	74 (30.7)	$\chi2$=13.462 df =6 P=0.036	70 (29)	$\chi2$=15.648 df =6 P=0.016
Labourer	30 (53.6)		28 (50)		29 (51.8)	
Agriculture	0 (0)		2 (50)		0 (0)	
Business	31 (40.8)		0 (0)		21 (27.6)	
Service	21 (33.3)		2 (33.3)		2 (33.3)	
Professional	0 (0)		0 (0)		2 (50)	
Retired	0 (0)		0 (0)		0 (0)	
Socio economic status						
Upper middle class	1 (7.7)	$\chi2$=7.429 df =3 P=0.059	0 (0)	$\chi2$=7.613 df =3 P=0.055	2 (15.4)	$\chi2$=1.922 df =3 P=0.589
Middle class	66 (42)		48 (30.6)		50 (31.8)	
Lower middle class	81 (44.8)		63 (34.8)		58 (32)	
Lower	141 (35.9)		15 (38.5)		14 (35.9)	
Tobacco chewing						
Yes	14 (66.7)	$\chi2$=5.771 df =1 P=0.016	4 (19)	$\chi2$=1.784 df =1 P=0.182	8 (38.1)	$\chi2$=0.406 df =1 P=0.524
No	148 (40.1)		122 (33.1)		116 (31.4)	
Duration of diabetes						
1 – 3 years	43 (43)	$\chi2$=3.213 df =3 P=0.360	32 (32)	$\chi2$=4.305 df =3 P=0.230	34 (34)	$\chi2$=4.729 df =3 P=0.193
3 – 5 years	111 (41)		86 (31.7)		83 (30.6)	
5– 7 years	6 (35.3)		6 (35.3)		5 (29.4)	
>7 years	2 (100)		2 (100)		2 (100)	
Hypertension						
Yes	94 (47)	$\chi2$=5.043 df =1 P=0.025	78 (39)	$\chi2$=8.407 df =1 P=0.004	71 (35.5)	$\chi2$=2.599 df =1 P=0.107
No	68 (35.8)		48 (25.3)		53 (27.9)	
Diabetic complication						
Yes	3 (42.9)	$\chi2$=0.005 df =1 P=0.943	2 (28.6)	$\chi2$=0.045 df =1 P=0.831	2 (28.6)	$\chi2$=0.034 df =1 P=0.853
No	159 (41.5)		124 (32.4)		122 (31.9)	

In the present study, 70% of female and 30% were male. A study by Arshiya et al reported divergent results with 47% were male and 43% were female participants.[12] Among study participants 3.6% were single (unmarried) and 96.4% were married. According to the study by Tilahun et al found that 21.2% were single (unmarried), 68.2% were married.[7] In the present study, 39% of study participants were Illiterate, 3.3% had studied till lower

School, 24.4% had studied till middle School, 20% had studied till high school, 9% had studied till PUC/Diploma, 2.6% were graduates, 1.8% were post-graduates. In a study by Nasser et al found that 14 % were illiterate, 22% had studied till secondary school, 9 had studied till higher secondary and 11 were graduates and above.[13] In the present study, 61.8% of study participants were Unemployed, 14.4% were labourers, 1% were agriculturist, 19.5% were involved in business, 1.5% were in service, 1% were professionals, 0.8% were retired people. The study by Tan reported that 35.4% were unemployed, 10.3% were professional, 35.9% were Non-professional, 19.4% were retired in their study.[6] In the present study, 3.3% belonged to Class II, 40.3% belonged to Class III, 46.4% belonged to Class IV, 10% belonged to Class V according to modified kuppuswamy classifiation. A study by Anantha reported 41.3% were in Class – I, 36.7% in Class – II, 16.7% in Class – III, 4.7% in Class – IV, 0.7% in Class -V.(1) The present study reports 77.2% were from joint family, 22.3% nuclear family and 0.5% subjects were in three generation family. A study by Das et al found that 80% were nuclear family, 20 were in Joint family.[10]

In the present study, 5.38% had history of tobacco chewing, 7.6% had history of betel leaf chewing, 11.5% had history of smoking and 6.4 had history of alcohol consumption. A study by Luke et al reported that 8.7% participants with alcohol history.[11] In the present study, 11% were having mild depression, 13.3% were having moderate depression, 10% were having severe depression and 7.2% were having extremely severe depression. In a study by Ranjan found that 32.2% were mildly depressed, 36.7%were moderately depressed, 14.4% had severe depression, and 16.7% had very severe depression.[10] In the present study 6.9% were having mild anxiety, 11.3% were having moderate anxiety, 10% were having severe anxiety and 11.5% were having extremely severe anxiety. In a study by Maryam reported that 37% were having mild anxiety, 13.6% were moderate anxiety, 13% were severe anxiety.[9] In the current study, 17.9% were having mild stress, 7.4% were having moderate stress, 14.9% were having severe stress and 1.5% were having extremely severe stress. The study by Atiqueur et al found that 37.1% of diabetes patients having no stress, 17.9% having mild stress, 24.6% having moderate stress and 20.4% having severe stress.[4] The following were considered as risk factors for depression, anxiety and stress among diabetics in the present study. Factors like age, education status, occupation, socio economic status, tobacco chewing, duration of diabetes, history of hypertension, diabetes complication. The present study noted statistically significant association between age of the study participants and depression with p-value of 0.008. Similar results were obtained in study conducted Arshiya et al statistical significance between age and depression with p value of 0.02.[12]

In our study it was noted that educational status of the study participants was significantly associated with depression in diabetics with p value of 0.008. Conflicting results were obtained in study conducted by Tan et al no statistical significance with the p value of 0.385.[6] The present study noted that occupation of the study participants was not statistically significant with depression among diabetics with p value of 0.078. Conflicting results was found in study conducted by Collins et al where statistical significant association was seen with the $p<0.01$.[14] As per current study socioeconomic status was not statistically significant with depression in diabetics with p value of 0.059. In a study conducted by Arshiya et al socio economic status was statistical significant association with the p-value of 0.023.[12] The present study was found that habit of tobacco chewing of the study participants was statistical significant association with depression in diabetics with p value of 0.016. In this study revealed that history of hypertension had statistical significant association with depression in diabetics with p value of 0.025. Conflicting results found in study conducted by Anantha et al no statistical significant with the p value of 0.528.[1]

Present study found that no statistical significant association between duration of diabetics and depression in diabetics with p value of 0.360. Similar result was found in a study conducted by Yatan Pal Singh et al where there was no statistical significant association with the p value of 0.87.[5] In current study noted that diabetic complication there was no statistical significant association with depression in diabetics with p value of 0.943. Conflicting results were found in a study conducted by Collins et al where statistical significant association was present with the p value of 0.03.[14] In this study found that age of study participant was statistical significant association was found with anxiety in diabetics with p value of 0.044. Conflicting results were obtained in the study done by Fang with no statistical significant association with the p value of 0.694.[15]

In this present study it was noted that there was no statistical significant association between educational status and anxiety in diabetics with p value of 0.128. Similar result was found in a study conducted by Collins et al where there was no statistical significant association with the p value of 0.27.[14] Present study noted that occupation was statistically significant association with anxiety in diabetics with p value of 0.036. Similar result found in a study conducted by Maryam et al with the p value of 0.015.[9] The Current study noted that Socio economic status was statistical significant associated with anxiety in diabetics with p value of 0.055. Current study showed that history of hypertension was statistically significantly associated with anxiety in diabetics with p value of 0.004. Conflicting results found in study conducted by Rajesh et al had no statistical significant association with the p value of 0.502.[16] In this study revealed that education status of study participant was statistical significant associated with stress in diabetics with $p<0.001$. Conflicting results were found in study conducted by Mohammed et al had no statistical

significant association with the p value of 0.507.[17] Current study found that occupation of study participants was statistically significantly associated with stress in diabetics with p value of 0.016. Conflicting results were found in study conducted by Mohammed et al had no statistical significant association with the p value of 0.368.[17] Present study showed that age of the study participants was statistically significantly associated with stress in diabetics with p value of 0.022. conflicting results were found in study done by Fang et al no statistical significant with the p value of 0.068.[15]

In the current study noted that habit of tobacco chewing was no statistical significant association with stress in diabetics with p value of 0.524. In this study noted that history of hypertension was no statistical significant association with stress in diabetics with p value of 0.107. Conflicting results were found in study conducted by Abdulbari et al had statistical significant association with the p value of 0.001.[18] In this study found that Duration of diabetes was no statistical significant association with stress in diabetics with p value of 0.193. Similar results were found in study done by Fang et al no statistical significant association with the p value of 0.559.[15] In the present study revealed that that diabetic complication among study participants was no statistical significant association with stress in diabetics with p value of 0.853. Similar results were found in study done by Tan et al had no statistical significant association with the p value of 0.453.[6]

Limitations

As the study was conducted in urban field practice area of Mysuru, so the results of the study cannot be generalized to the whole community.

CONCLUSION

The prevalence of depression, anxiety and stress in patients with type-2 diabetes in our study was low. Age, education, tobacco chewing, hypertension was statistically significant associated with depression. Age, occupation, hypertension was statistically significant associated with anxiety. Age, education, occupation was statistically significant associated with stress.

Recommendations

It is essential that health care providers must screen for mental health illness among T2DM patients. The Diabetes patients should be advised to follow a healthy diet to maintain both physical and mental health. Regular counselling sessions should be conducted for all T2DM patients to improve their mental health status.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

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Cite this article as: Abhishek R, Murthy MRN, Chandan N. Assessment of mental health status among type 2 diabetics in urban field practice area of JSS Medical College, Mysuru. Int J Community Med Public Health 2022;9:2200-7.