

Original Research Article

Prevalence of depression and anxiety in type 2 diabetes mellitus patients in tertiary care hospital

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ABSTRACT

Background: The prevalence of depression and anxiety in diabetes is considerably higher than normal population and found to have a negative impact on diabetes. Objective of the study was to assess the prevalence of depression and anxiety and to identify their associated risk factors among people with type 2 diabetes mellitus.

Methods: Descriptive study was done in Endocrine and medicine outpatient Department of Vijaya Hospital in Belagavi, South India. Total 384 patients with type 2 diabetes mellitus were interviewed for depression and anxiety by administering the Hospital Anxiety and Depression Scale (HADS).

Results: Of the total 384 patients surveyed, depression and anxiety were found in 32.56%. (95% CI 27.8-37.2%) and 37.76% (95% CI 33.1-42.9%) respectively. In Multiple Logistic regression analysis age, unmarried, religion, duration of type II diabetes and type of treatment were significantly associated with depression symptoms, Anxiety symptoms were associated with age, Qualification, Occupation, Religion, Duration and type of treatment.

Conclusions: This study found a high prevalence of depression and anxiety in patients with Type 2 DM. Therefore, the care of individuals with type 2 Diabetes Mellitus (DM) should include the screening and possible treatment of depression and anxiety in order to achieve and sustain treatment goals.

Keywords: Anxiety, Depression, Tertiary care hospital, Type 2 diabetes mellitus

INTRODUCTION

Diabetes mellitus is a group of metabolic diseases characterized by hyperglycemia resulting from defects in insulin secretion, insulin action, or both. It has been classified as type 1 DM and type 2 DM. Type 1 DM, a subtype of Diabetes Mellitus results due to complete or near total insulin deficiency whereas Type 2 DM characterized by variable degree of insulin resistance, impaired insulin secretion and increased glucose production.¹ The WHO estimated the population of diabetes patients to increase from 171 million in 2000 to 366 million by 2030 worldwide.² Prevalence study also reported that there are currently 285 million people with

diabetes worldwide and this number is set to increase to 438 million by year 2030.³ Type 2DM is estimated to be 90-95% of the total global morbidity of DM.⁴ India has more than 50 million Type 2 diabetes patients.⁵ India will soon be the capital of diabetes. Depression and anxiety are other prevalent condition in diabetes mellitus. Approximately 340 million people worldwide suffer from depression at any given time.⁶ The World-wide estimated prevalence of depression and anxiety is 25% and 7.3%. Depression disorders are more in women than men. Life time prevalence of depression is 10-2%.⁷ The prevalence of depression and anxiety in diabetes is considerably higher than normal population and lies between 12-28%.⁸ However, the differences in prevalence rate may be

attributed to various scales used and methods that were applied in calculating the prevalence rate of depression and anxiety.

METHODS

The study had Non-Experimental Descriptive study design. It was carried out from May 2018 to March 2019 among all 384 patients with Type 2 Diabetes mellitus who were attending the outpatient department of Endocrine and medicine of Vijay Hospital Belagavi, south India. Objectives and benefits of the study were explained in verbal and written form attached to the questionnaires.

Patients were assured that their participation was confidential and would not affect their medical treatment outcomes. A written consent was obtained from those who agree to participate in the study. The investigator was trained to conduct interview using Hospital Anxiety and depression Scale (HADS) by interviewing the patient and supplemented by patient records. The questionnaire was translated into the local Kannada language for better understanding.

Inclusion criteria

- Patients age between 30-60 years with Type 2 DM (Fasting glucose level more than or equal to 126 mg/dl and post prandial, more than or equal to 200 mg/dl) were considered for the study.

Exclusion criteria

- Excluding those who are diagnosed psychiatric problems/illness or those who are currently on anti-depressants, pregnant women and seriously ill patients.

The study protocol was approved by the Ethics committee of the institute. Informed written consent was obtained from all the participants, after explaining the objectives of the study.

Statistical analysis

The Data collected during the study was entered in the Microsoft excel Format and was analysed and using Statistical Package for Social Sciences (SPSS) (V.20.0). A descriptive Statistical analysis was done for continuous and categorical variables.

Differences in characteristics between participants were tested with t-test for normally distributed variables. Multivariate regression analysis was used to evaluate the anxiety and depression symptoms singly or combination in relation to glycemic control. Results were expressed as odds ratio (OR) and 95% confidence intervals. The minimum statistical significance level for all analysis was $p < 0.05$.

RESULTS

A total of 384 participants were included in the study, in which 261 (67.97%) were male and 123 (32.03%) female participants. Most of the study participants i.e. about 200 (52.08%) belongs to the age group of 41-50 years 108 (28.13%) belonged to the age group of 30-40 years followed by 76 (19.79%) belonged to the age group of 51-60 years. Majority of 218 (56.77%) of the respondents were suffering with type II diabetes in the range of 0-5 years and 20 (5.21%) were suffering from type II diabetes for more than 16 years and almost 247 (64.32%) were on oral hypoglycaemia drugs, whereas 49 (12.76%) respondents received both insulin and oral hypoglycemic drugs. Most of the respondents 279 (72.66%) belonged to middle class families and 39 (10.16%) of the respondents belonged to lower class families. Majority of the respondents 294 (76.56%) were married, 44 (11.46%) were unmarried, 28 (7.29%) were widow and only 18 (4.69%) were divorced. Almost 164 (42.71%) respondents completed their graduation whereas, 68 (17.71%) did their higher secondary education, 57 (14.84%) completed their secondary school, 50 (13.03%) did not have any formal education and only 45 (11.72%) did their secondary school education. Around 136 (36.45%) of the respondents were private employees and (5.21%) were farmers. Table 1 Shows Distribution of study respondents by different characteristics.

Reveals the multiple logistic regression analysis of depression by demographic characteristics with age, unmarried respondents, religion, duration of type II diabetes and type of treatment showed significant contribution with depression ($p < 0.05$). This shows that respondents who were above 40 years of age (Odd ratio - 0.39, 95% CI:0.20-0.76 and 0.06, 95% CI:0.02-0.21) expressed greater depression as compared to respondents below 40 years. Unmarried respondents also showed depression symptoms (Odd ratio - 0.43, 95% CI:0.18-1.03). Religion also showed strong contribution towards depression where Muslims, Christians and other religion respondents were more depressed than Hindus (Odd ratio - 0.40, 95% CI:0.17-0.95, 0.39, 95% CI:0.15-1.00 and 0.49, 95% CI:0.25-0.95) respectively. Respondents who were suffering from type II diabetes for more than 16 years showed significant contribution towards depression than compared to others (Odd ratio - 6.34, 95% CI:1.36-29.68). Those on insulin and combined with insulin and OHD showed greater contribution towards depression (Odd ratio - 2.05, 95% CI:1.13-3.74 and 8.48, 95% CI:3.53-20.35). Table 2 shows multiple logistic regression analysis of depression by demographic characteristics.

Reveals the regression analysis of anxiety by demographic characteristics with age, qualification, religion, duration of type II diabetes and type of treatment showed significant contribution with anxiety ($p < 0.05$). This shows that respondents who were above 50 years of

age expressed more anxiety (Odd ratio-0.11, 95% CI:0.03-0.32). Respondents who were not educated and higher Secondary Education were more anxious about

their condition (Odd ratio -3.91,95% CI:1.53-10.03 and 4.99,95% CI:1.70-14.65).

Table 1: Distribution of study respondents by different characteristics.

		No of respondents	% of respondents
Age groups	30-40	108	28.13
	41-50	200	52.08
	51-60	76	19.79
Gender	Male	261	67.97
	Female	123	32.03
Marital status	Married	294	76.56
	Unmarried	44	11.46
	Divorced/divorced	18	4.69
Qualifications	No formal education	50	13.02
	Primary school	57	14.84
	Secondary school	45	11.72
	Higher secondary education	68	17.71
	Graduates and above	164	42.71
Socio economic status	Upper class	66	17.19
	Middle class	279	72.66
	Lower class	39	10.16
Occupations	Government employee	57	14.84
	Private employee	136	35.42
	Self employed	96	25.00
	Agriculture	20	5.21
	House wife	75	19.53
Types of family	Joint	86	22.40
	Nuclear	298	77.60
Religion	Hindu	215	55.99
	Muslim	49	12.76
	Christian	38	9.90
	Others	82	21.35
Duration	0-5	218	56.77
	6-10	120	31.25
	16-20	26	6.77
Treatment	OHD	247	64.32
	Insulin	88	22.92
	Insulin and OHD	49	12.76
	Total	384	100.00

Respondents who were Christian, Muslim and other religion people expressed anxiety (Odd ratio- 0.42,95% CI:0.19-0.93, 0.29, 95% CI:0.12-0.74 and 0.47, 95% CI:0.25-0.89).

Respondents who were suffering from 6-10 years had more anxious (Odd ratio - 2.23, 95% CI:1.20-4.16) and those on insulin and OHD also showed greater contribution towards anxiety (Odd ratio - 2.03,1. 95% CI:13-3.65 and 4.70, 95% CI:2.04-10.28). Table 3 shows multiple logistic regression analysis of anxiety by demographic characteristics.

DISCUSSION

This study aimed to determine the prevalence of depression and anxiety in type 2 diabetes. Of the 384 patients with type 2 Diabetes surveyed, depression and anxiety in type 2 Diabetes mellitus patient were found to be 32.56% (95% CI 27.8-37.2%) and 37.76% (95% CI 33.1-42.9%) respectively. A rising trend in prevalence of depression and anxiety in diabetes patients has been suggested by the studies done in various parts of the world as well as in India. The prevalence of depression among the participants in the current study was found to

be 32.56% is comparable with previous findings in Northern India 41%, Netherlands 31%, in Bahrain 33.3%,

in Malaysia 30.5%, A multi-center study done in Pakistan found prevalence as 43.5%.⁹⁻¹³

Table 2: Multiple logistic regression analysis of depression by demographic characteristics (n=384).

		Normal	%	Abnormal	%	Or	95% CI for or		p-value
							Lower	Upper	
Age in years	30-40yrs	70	64.81	38	35.19				
	41-50yrs	139	69.50	61	30.50	0.39	0.20	0.76	0.0060*
	51-60yrs	50	65.79	26	34.21	0.06	0.02	0.21	0.0001*
Gender	Male	174	66.67	87	33.33	0.63	0.31	1.31	0.2160
	Female	85	69.11	38	30.89				
Marital status	Married	196	66.67	98	33.33				
	Unmarried	29	65.91	15	34.09	0.43	0.18	1.03	0.0500*
	Divorced	12	66.67	6	33.33	0.58	0.20	1.66	0.3090
	Widow	22	78.57	6	21.43	0.42	0.10	1.77	0.2350
Qualification	No formal education	45	90.00	5	10.00	2.24	0.83	6.03	0.1100
	Primary school	40	70.18	17	29.82	1.27	0.41	3.99	0.6770
	Secondary school	35	77.78	10	22.22	2.32	0.80	6.70	0.1210
	Higher secondary education	46	67.65	22	32.35	3.41	1.12	10.44	0.0320*
	Graduates and above	93	56.71	71	43.29				
Socio-economic status	Upper class	29	43.94	37	56.06				
	Middle class	195	69.89	84	30.11	1.49	0.53	4.16	0.4520
	Lower class	35	89.74	4	10.26	0.78	0.35	1.76	0.5520
Occupation	Government employee	31	54.39	26	45.61	1.86	0.52	6.63	0.3420
	Private employee	95	69.85	41	30.15	0.81	0.25	2.60	0.7240
	Self employed	59	61.46	37	38.54	1.66	0.58	4.81	0.3480
	Agriculture	18	90.00	2	10.00	0.20	0.03	1.31	0.0940
	Housewife	56	74.67	19	25.33				
Type of family	Joint	52	60.47	34	39.53	0.84	0.45	1.59	0.5980
	Nuclear	207	69.46	91	30.54				
Religion	Hindu	129	60.00	86	40.00				
	Muslim	38	77.55	11	22.45	0.40	0.17	0.93	0.0340*
	Christian	29	76.32	9	23.68	0.39	0.15	1.00	0.0500*
	Others	63	76.83	19	23.17	0.49	0.25	0.95	0.0350*
Duration of type-ii diabetes in years	0-5 years	158	72.48	60	27.52				
	6-10 years	77	64.17	43	35.83	2.21	1.14	4.28	0.0190*
	11-15 years	16	61.54	10	38.46	4.04	0.92	17.87	0.0650
	16+ years	8	40.00	12	60.00	6.34	1.36	29.68	0.0190*
Type of treatment	Oral hypoglycemic drugs	193	78.14	54	21.86				
	Insulin	51	57.95	37	42.05	2.05	1.13	3.74	0.0180*
	Insulin and ohd	15	30.61	34	69.39	8.48	3.53	20.35	0.0001*
	Total	259	67.45	125	32.55				

*p<0.05

Various other studies found that prevalence of depression in T2DM ranging from 13.6% to 67.5%.^{14,15} However, studies from US and UK reported the prevalence of depression in patients with T2DM varying from 30% to 83%.^{16,17} Similarly, a meta-analysis identified the

prevalence of depression in diabetes ranging from 8% to 61%.¹⁸

These distinctions can be due to the differences in sample size, socio demographic condition, and others. In

addition, the lack of documentation regarding relevant factors associated with the disease condition may

confound results of clinical studies and skew rate.

Table 3: Multiple logistic regression analysis of anxiety by demographic characteristics (n=384).

		Normal	%	Abnormal	%	Or	95% CI for or		p-value
							Lower	Upper	
Age in years	30-40 yrs	64	59.26	44	40.74				
	41-50 yrs	123	61.50	77	38.50	0.58	0.31	1.08	0.0840
	51-60 yrs	52	68.42	24	31.58	0.11	0.03	0.32	0.0001*
Gender	Male	162	62.07	99	37.93	0.69	0.34	1.39	0.2970
	Female	77	62.60	46	37.40				
Marital status	Married	178	60.54	116	39.46				
	Unmarried	29	65.91	15	34.09	0.58	0.25	1.33	0.1960
	Divorced	12	66.67	6	33.33	0.55	0.20	1.54	0.2560
	Widow	20	71.43	8	28.57	0.32	0.08	1.33	0.1170
Qualification	No formal education	42	84.00	8	16.00	3.91	1.53	10.03	0.0050*
	Primary school	33	57.89	24	42.11	1.30	0.45	3.78	0.6340
	Secondary school	34	75.56	11	24.44	2.20	0.81	6.01	0.1230
	Higher secondary education	45	66.18	23	33.82	4.99	1.70	14.65	0.0030*
	Graduates and above	85	51.83	79	48.17				
Socio-economic status	Upper class	28	42.42	38	57.58				
	Middle class	182	65.23	97	34.77	1.19	0.45	3.17	0.7280
	Lower class	29	74.36	10	25.64	0.70	0.34	1.47	0.3500
Occupation	Government employee	32	56.14	25	43.86	0.87	0.25	3.00	0.8220
	Private employee	87	63.97	49	36.03	0.62	0.20	1.90	0.4000
	Self employed	53	55.21	43	44.79	1.37	0.50	3.74	0.5390
	Agriculture	18	90.00	2	10.00	0.09	0.01	0.57	0.0110*
	House wife	49	65.33	26	34.67				
Type of family	Joint	46	53.49	40	46.51	1.06	0.59	1.92	0.8460
	Nuclear	193	64.77	105	35.23				
Religion	Hindu	117	54.42	98	45.58				
	Muslim	35	71.43	14	28.57	0.42	0.19	0.93	0.0320*
	Christian	29	76.32	9	23.68	0.29	0.12	0.74	0.0100*
	Others	58	70.73	24	29.27	0.47	0.25	0.89	0.0200*
Duration of type-ii diabetes in years	0-5 years	144	66.06	74	33.94				
	6-10 years	66	55.00	54	45.00	2.23	1.20	4.16	0.0110*
	11-15 years	18	69.23	8	30.77	1.74	0.44	6.96	0.4320
	16+ years	11	55.00	9	45.00	2.07	0.49	8.71	0.3190
Type of treatment	Oral hypoglycemic drugs	174	70.45	73	29.55				
	Insulin	47	53.41	41	46.59	2.03	1.13	3.65	0.0190*
	Insulin and OHD	18	36.73	31	63.27	4.70	2.04	10.82	0.0001*
	Total	239	62.24	145	37.76				

CONCLUSION

Among diabetes mellitus, depression and anxiety is common co-morbidity. This correlation is governed by several socio demographic variables' endemic to the Indian subcontinent. Treating depression and anxiety in patients with type 2 diabetes is emerging as an integral part of holistic diabetic care worldwide.

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