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PATTERN OF DEPRESSION AMONG TYPE 2 DIABETIC PATIENTS ATTENDING FAMILY MEDICINE CLINIC FEDERAL TEACHING HOSPITAL IDO-EKITI

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ABSTRACT

People with Diabetes Mellitus are almost twice as likely to suffer from Depression as the general population, but this often remains un-recognized and thus untreated. This was a cross sectional study. Based on the calculated sample size, one hundred and fifty consecutive and consenting type 2 diabetic patients were screened for depression using patient Health Questionaire-9 (PHQ-9). The age of the studied respondents ranged between 44years and 78years with a mean age of 58± 8.4years. Fifty one of the one hundred and fifty respondents (34%) were found to have mild to moderate depression. In this study, the presence of other comorbidity or complications and poor glycaemic control were identified as factors associated with depression among diabetic patients. It is advised that physicians should investigate for depression among diabetic patients who have been on medication for a long time since depression has been associated with poor adherence to medication with resultant poor glycaemic control. Control of depression in diabetic patient, is an important and cost-effective strategy to reduce major diabetic complications.

INTRODUCTION

Non-communicable diseases including diabetes account for 60% of all deaths worldwide,[1] and the largest age group currently affected by diabetes is between 40-59 years, and by 2030 this "record" is expected to move to the 60-79 age groups with some 196 million cases.[2] While the global prevalence of diabetes is 6.4%, the prevalence varies from 10.2% in the Western Pacific to 3.8% in the African region.[1] In Nigeria over the past 30years, the prevalence of diabetes has been increasing steadily.[3] A national survey in 1992 by a Non-communicable disease expert committee of the Federal Ministry of Health recorded a prevalence of 2.2% (National prevalence), the lowest rate of 0.65% in rural Mangu Plateau State and highest rate of 11.0% in Lagos Island.[4] A report from the world health survey carried out to estimate the prevalence of depression (based on ICD-10 criteria) in 245,404 individuals from 60 countries around the world and found the overall prevalence of self-reported symptoms of depression in individuals with diabetes to be 9.3%.[5]

In actual fact, Type 2 diabetes mellitus patient has been reported to double the odds of suffering from depressive illness. However, the duration of diabetes has been identified as a predictor to the development of depression in them,[6] the study carried out by Mathew and colleagues reported that over one third of the patients with type 2 diabetes mellitus over five years duration in their study had depressive symptoms and the median age of onset of depression was reported to be 9.9 years,[6] however a study carried out in Benin in which most of the patients, (64.5%) were diagnosed of type 2 diabetes mellitus for less than 5 years with the mean duration of diabetes at 5.2 years found no significant relationship between diabetic mellitus and depression.[7] This was similar to the study by RavalAmit and colleagues in Indian in which the likelihood of depression was not significant with the duration of diabetes in their study.[8] Nevertheless another study by Abdulbari and colleagues, likewise a study in Jos, a city in Nigeria found that the duration of diabetes mellitus was a major predictor for depression score (OR 2.68, CI 1.65-4.84, P value = 0.011).[9]

A few numbers of studies have examined whether the presence of diabetes actually increases the risk of depression in people with type 2 diabetes,[10] but more number of studies have investigated the impact of depression on glucose control in diabetic patients. These studies are divided, with some finding a relationship between the presence of depression and glucose control and others finding no such association.[10,11,12] It has been pointed out that depression in diabetes results in a high economic burden to the society in terms of both direct and indirect costs.[12,13]

The pattern of Depression in Nigeria population has been shown to be high and it is related to socio-demographic factors and low socio economic status,[12,13] however, a cross-sectional study at Al-Makhfiah primary healthcare center, Nablus, Palestine by Sweileh et al showed that the existence of diabetes mellitus increases the probabilities of depression occurrence and that depression symptoms were significantly more in women than men,[14] also other risk factors for depression were age, central obesity, diabetes complications, increased pill burden.[14] Diabetes is considered one of the most psychologically and behaviourally demanding of the chronic medical illnesses since 95% of diabetes management is conducted by the patient.[15]

METHOD OF THE STUDY

This was a cross-sectional hospital based study on depression as co morbidity among type 2 Diabetes Mellitus patients attending the Family Medicine practice, Federal Medical Centre Ido-Ekiti. All consenting type 2 Diabetes Mellitus patients aged 40years and above who have been on treatment for at least a month (this was to allow for a minimum of 2weeks criteria for depression) were studied.

The sample size was determined using Fischer'sformula.[16] Sample size (n) = Z^2P (1-P)/d^2 and nf = n/1+n/N. Where N= the estimated population size in a year (for type 2 diabetes mellitus in 2017 at the Clinic = 3600), Z= 1.96 at 95% confidence interval obtained from standard statistical table of normal distribution, P= estimated prevalence rate of type 2 diabetes patient in a given population, D = degree of accuracy desired usually set at 0.05. From the available local study on prevalence of type 2 diabetes mellitus in Uyo, 2010. A prevalence (P) of 10.51%[17] was reported and this was used to calculate the sample size for this research. Based on the above 150 sample size was derived with attrition of 10%.

Systematic sampling technique was used to recruit subjects among diabetes patients attending the clinic. The General Outpatient medical records of the Hospital showed that between 15 and 18 patients with type 2 diabetic patients attended the clinic daily which translates to about 75 patients per week (5 working days.), And for the 8 weeks of the research about 600 type 2 diabetic patients were encountered of which the sample was selected systematically as calculated from the sample interval thus; K=N/n where K= sample interval, N= total number of patient encountered, n= calculated sample size=600/150 = 4

PHQ-9 questionnaire was administered to the respondents and scored; any participant with score above 4 on summation was adjudged depressed.

RESULTS

A total number of 150 type 2 Diabetes Mellitus patients including 69 (46.0%) men and 81 (54.0%) women were evaluated in the study. The mean age + SD of patients were 58.7 + 8.4 years. Among the patients, 51 (34%) were depressed. The Yoruba race was 71.3% and 70.7% were Christian. Majority 130 (86.7%) of the respondents were married with 50% of them residing in the rural area.

Table 1: Demographic characteristics.

Variables	Depressed T2DM (n = 51)	Non-depressed T2DM (n = 99)	Total N = 150	χ2	df	p- value
Age in years			(%)			
Mean ± SD	59.7 ± 8.5	58.1 ± 8.2	58.7 ± 8.4	1.101	148	0.273*
(Min - Max)	(45 - 76)	(44 - 78)	(44 - 78)			
Age group in yrs *n (%)*						
40 - 49	6 (31.6)	13 (68.4)	19 (12.7)	1.846	3	0.605
50 - 59	16 (28.1)	41 (71.9)	57 (38.0)			
60 - 69	21 (39.6)	32 (60.4)	53 (35.3)			
70+	8 (38.1)	13 (61.9)	21 (14.0)			
Gender						
Male	22 (29.3)	53 (70.7)	75 (50.0)	1.456	1	0.228
Female	29 (38.7)	46 (61.3)	75 (50.0)			
Ethnicity						
Yoruba	38 (35.5)	69 (64.5)	107 (71.3)	2.236	2	0.327
Ibo	12 (35.3)	22 (64.7)	34 (22.7)			
Hausa	1 (11.1)	8 (88.9)	9 (6.0)			
Christian	39 (36.8)	67 (63.2)	106 (70.7)	1.950	2	0.458**
Islam	12 (28.6)	30 (71.4)	42 (28.0)			
Traditional	0 (0.0)	2 (100)	2 (1.3)			
Marital status						
Single	0 (0.0)	2 (100)	2 (1.3)	2.164	4	0.764**
Married	43 (33.1)	87 (66.9)	130 (86.7)			
Divorced	1 (50.0)	1 (50.0)	2 (1.3)			

Separated	1 (33.3)	2 (66.7)	3 (2.0)		
Widowed	6 (46.2)	7 (53.8)	13 (8.7)		
Domicile					
Urban Ekiti	27 (38.6)	43 (61.4)	70 (46.7)	1.460	2	0.561**
Rural Ekiti	23 (30.7)	52 (69.3)	75 (50.0)		
Outside Ekiti	1 (20.0)	4 (80.0)	5 (3.3)		
* independent samples t test; ** Fisher's exact test					

Table 1 showed the demographic characteristic of the type 2 diabetes mellitus patient that participated in the study. There was no demographic characteristic that was statistically significant among them.

Table 2. Family and socio-economic characteristics.

Variables	Depressed T2DM (n = 51)	Non-depressed T2DM (n = 99)	Total N = 150(%)	χ^2	df	p-value
Family type						
Monogamous	30 (31.3)	66 (68.7)	96 (64.0)	0.899	1	0.343
Polygamous	21 (38.9)	33 (61.1)	54 (36.0)			
Education						
None	1 (100.0)	0 (0.0)	1 (0.7)	3.786	4	0.473*
Primary	2 (16.7)	10 (83.3)	12 (8.0)			
Secondary	10 (38.5)	16 (61.5)	26 (17.3)			
Tertiary	19 (34.5)	36 (65.5)	55 (36.7)			
Postgraduate	19 (33.9)	37 (66.1)	56 (37.3)			
Occupation						
C/S	16 (35.6)	29 (64.4)	45 (30.0)	6.757	5	0.239*
Artisan	2 (11.1)	16 (88.9)	18 (12.0)			
Trading	18 (40.9)	26 (59.1)	44 (29.3)			
Farming	7 (30.4)	16 (69.6)	23 (15.3)			
Housewife	2 (66.7)	1 (33.3)	3 (2.0)			
Retiree	6 (35.3)	11 (64.7)	17 (11.3)			
Average monthly income ('000 NGN)						
Median (range)	25 (10 - 150)	30 (10 - 100)	27.5 (10 -150)	-0.296		0.767**
Low (< 10)	40 (33.3)	80 (66.7)	120 (80.0)	3.949	2	0.181*
Middle (10-100)	9 (32.1)	19 (67.9)	28 (18.7)			
High (> 100)	2 (100)	0 (0.0)	2 (1.3)			

* Fisher's exact test applied; **Mann-Whitney U test applied

Table 2: showed the family and socio-economic characteristics of the respondents. Majority of the respondents 96(64%) were from monogamous family setting while 74% had tertiary education with 0.7% with no formal education. About 30% of the respondents were civil servant and 120 (80%) had average monthly income of less than ₦10,000.

Table 3: Diabetic Clinical features.

Variables	Depressed T2DM (n = 51)	Non-depressed T2DM (n = 99)	Total (N = 150)	χ^2	df	p- value
Drug duration (yrs)						
Median (range)	5.0(1.0- 12.0)	4.0(1.0- 12.0)	4.0 (1.0 - 12.0)			
< 5 years	25 (31.6)	54 (68.4)	79 (52.7)	0.412	1	0.521
5 or more years	26 (36.6)	45 (63.4)	71 (47.3)			
Current treatment						
Diet	0 (0.0)	1 (100)	1 (0.7)	2.117	3	0.803*
Diet + OHA	51 (34.9)	95 (65.1)	146 (97.3)			
Diet + Insulin	0 (0.0)	1 (100)	1 (0.7)			
Diet+OHA+Insulin	0 (0.0)	2 (100)	2 (1.3)			
Glycaemic control						
Good (≤ 6.0 mmol/l)	1 (1.7)	58 (98.3)	59 (39.3)	45.229	1	**0.001***
Poor (> 6.0 mmol/L)	50 (54.9)	41 (45.1)	91 (60.7)			
Co-morbidity						

Present	41 (41.0)	59 (59.0)	100 (66.7)	6.551	1	**0.010**
Absent	10 (20.0)	40 (80.0)	50 (33.3)			
Complication						
Present	48 (58.5)	34 (41.5)	82 (54.7)	48.529	1	**< 0.001**
Absent	3 (4.4)	65 (95.6)	68 (45.3)			

* Fisher's exact test applied.

Table 3: showed Diabetic clinical features of Depressed and non-depressed type 2 Diabetes Mellitus patient. The median year on the duration of diabetes mellitus among the participant had a p-value of 0.025, this was found to be statistically significant. The presence of co morbidity and complications among them were also found to be significant statistically with a p-value of 0.010 and 0.001 respectively with > 90% of the depressed having complications. However the current treatment and drug duration were found not to be significant with a p-value of 0.803.

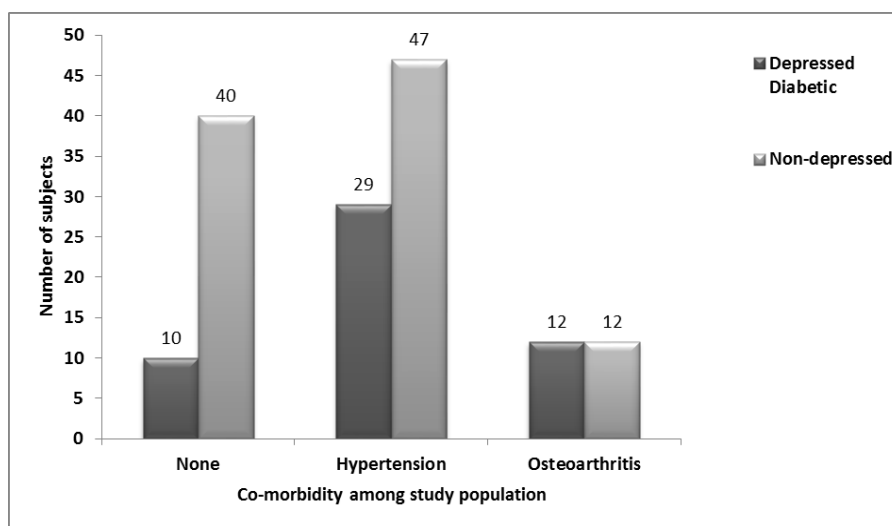**Figure 1: Showing the pattern of comorbidity among the depressed and non - depressed participant. The only comorbidity among them were Hypertension and osteoarthritis.**
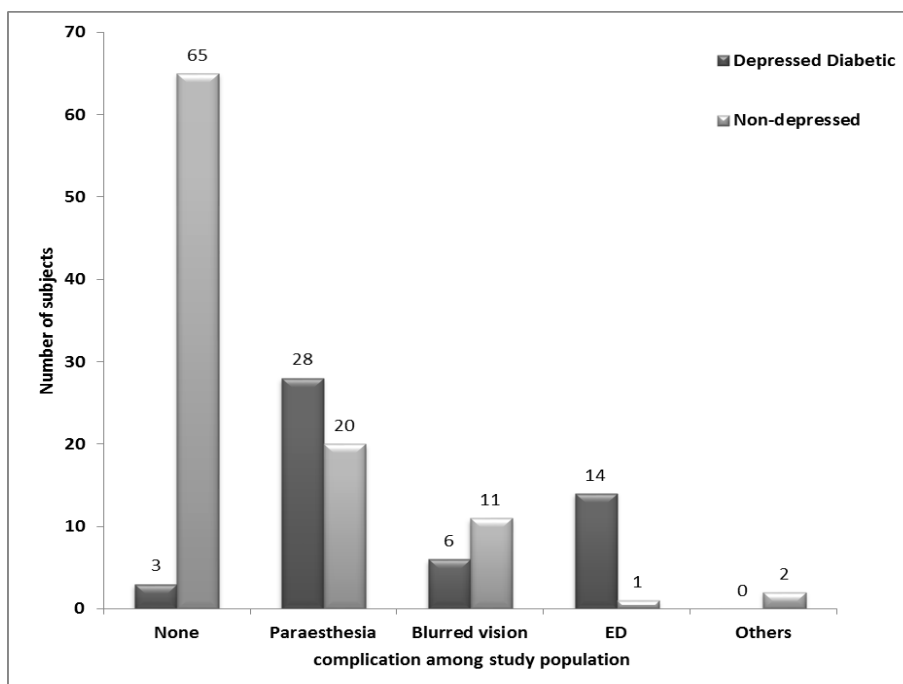

Figure 2: Showed the pattern of complications of diabetes among the participants with highest complication being paraesthesia(58.5%) of which 58.3% are depressed, followed by ED (erectile dysfunction) and blurred vision.

Figure 2: The Bar chart of complication among study population.

DISCUSSION

The Prevalence of depressive disorder among Type 2Diabetes Mellitus

The socio demographic features of this study showed the mean age distribution of the type 2 diabetes patients that participated to be 58.7± 8.5years, this was higher than the mean age of 47±9.6years reported by Bawo and colleagues.[18] The reason for this variation could be due to the difference in age range of 44 – 78 years in this study to the age range of 20 – 64 years adopted in their study. However greater percentages (38.0%) of the participant in this study were at the age range of 50 to 69 years and this was similar to the age 45 to 64 years described as the peak age range for Diabetes in developing countries.[2]

The prevalence of depression among type 2 diabetes patients attending Family Medicine practice in Federal Medical Centre Ido-Ekiti from this study was 34%, this was slightly higher than 11.5% - 35% reported in various other studies,[12,18,19,20] however Sweileh et al and Raval et al documented in their studies that 40% and 41% respectively of diabetic patients suffer from a depressive disorder.[8,14] A higher prevalence was also observed in the study of Abdulbari where 52% of the diabetic patients had depressive disorders.[9] A study by Lloyd indicated a greater amount of diabetes related psychological distress in one-third of the sample with a significant association between depressive status and diabetes and this was similar to the findings in this study.[21] A possible explanation for the differences in prevalence of these studies could be attributed to the different measurement or screening tools used to determine the presence of depression as well as the population where the studies were conducted.

It was found in this study that people in the age group 60-69years, females, the divorced respondents and urban dwellers had higher rate of depression, though these were not statistically significant. The similarities in sex cut across studies, Abdulbariet al, KaurandAgbir et al reported that depression was significantly associated with diabetic women.[9,20,22] The findings of female sex could be attributable to gender-specific issues like pregnancy, menstrual cycle changes, post-partum and additional stresses such as responsibilities at work and at home, single parenthood, caring for children and aging parents which could all lead to depression.

While depression was higher among the divorced and widowed respondents in this study, Kaur and Agbir also reported that depression was significantly associated with never married, divorced, separated or widowed.[20,22] even though in our study there was no statistically significant difference. This finding could be explained by the fact that married people tend to have the needed support from their partners who they share their

problems with when in a stressful situation. Furthermore, having a partner or spouse in a stable marriage offers emotional stability as well as shared burden in coping with challenges whereas having a poor relationship with the sexual partners and marital conflict are known to create problems or precipitate depressive disorders.[22]

Hundred percent of those with no formal education were depressed while the risk of depression declined as education level inclined, 38.5%, 34.5%, 33.9% in secondary, tertiary and postgraduate educational levels respectively. About 74% of the respondents had post-secondary education. These findings were however similar to Sweileh et al[14], who reported that there is a significant association between depression and diabetic respondents with no or low educational level but not in agreement with the study by Agbir et al who did not find a significant association between educational status of the respondents and the diagnosis of depression.[22] This possibly could be explained by the fact that most diabetics without education did not see the need of coming to a tertiary hospital for treatment, or could have died due to their low socioeconomic status.

Fifty percent of the respondents in this study were rural dwellers with only30.6% of them being depressed while 38.6% of diabetic urban dwellers were depressed though no significant statistical difference.

In this study, 146 (97.3%) of the respondents are on dietary plus oral hypoglycaemic agents but only 34.9% of them have depression, type of treatment received was not statistically significant with respect to development of depression. The level of diabetic control was related to medication adherence and this was found to be a significant predictor of depression among diabetic patients.[20] A glycated haemoglobin of >8.5 was found to be statistically significantly associated with depression by Kaur et al. The difference from this study was that glycated heamoglobin was not used

Comorbidity of depression in diabetes mellitus patients may lead to poorer outcomes and increased risk of complications by lowering adherence to glucose monitoring, exercise, diet, and even medication regimens.[15] In this study, 41% of the diabetic patients with co-morbidity had depression while only 20% without co-morbidity had depression with statistically significant difference. This was not in agreement with Kaur et al who reported that only 11.4% of depressed diabetic patients in their study had at least one co-morbidity.[20] Hypertension was the commonest co-morbidity in this study with 62% of those with hypertension being depressed and this was statistically significant. Kaur et al reported that multiple additional illnesses are potential causes of depression among diabetics but they did not specify the types of co-morbidity seen in their study.[20] Abdulbari et al also reported hypertension as a significant predictor of depression among diabetics.[9]

Parasthesia (58.5%) was the commonest complication among the participants with 58.3% being depressed and this was statistically significant. Also 93.3% of diabetic men with erectile dysfunction had depression making erectile dysfunction the complication with the highest or strongest association with depression in people with diabetic patients. The differences observed in all these studies could be attributed to the methodology, location and population used.

CONCLUSION

There is a high prevalence of depression as comorbidity among type 2 diabetes mellitus patients.

Recommendation
1. Physicians should know that patients with diabetes are more likely to be affected by Depression.
2. Patient Health Questionnaire – 9 (PHQ-9) can be used periodically to assess the depressive symptoms in them as it is simple to use, consisting of only 9 questions

Limitations
1. This study was carried out in a tertiary health care setting with the findings not likely to be applicable to the general population

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