Original Research Article

SOCIAL SUPPORT AND DEPRESSION AMONG PATIENTS WITH TYPE 2 DIABETES MELLITUS ATTENDING A SECONDARY HEALTH CARE FACILITY IN SOUTHWEST NIGERIA.

ABSTRACT

Aims: To assess the level of social support and determine the relationship between depression and social support among patients with type 2 diabetes mellitus (DM).
Study design: This study was a cross-sectional survey.
Place and Duration of Study: The study was carried out at the Medical Out Patients(MOP) clinic of Jericho Specialist Hospital, Ibadan between 1st of August and 30th of September 2017.
Methodology: Systematic sampling technique was used to recruit 273 type 2DM patients who were 40 years and above, receiving care at the MOP clinic for at least 3months. Diabetes-related information was collected using a semi-structured questionnaire. Zung self-rating depression and multidimensional perceived social support scales were used to assess depression and social support respectively. Independent t-test was used to determine the relationship between depression and social support and the level of significance was set at $p<.05$.
Results: Half (50.5%) of the respondents were diagnosed in the past 5 years as having type 2DM, 79.5% had hypertension as a co-morbidity and 51.6% had good glycaemic control. The prevalence of depression was 27.5%, mild and moderate depression were 26.4% and 1.1% respectively and none had severe depression. One hundred and two (37.4%),56.0% and 6.6% respondents had high, moderate and low social support respectively. The highest social support scores 5.9 ± 1.7 was from family. Total perceived social support was higher among non-depressed diabetic respondents. There was a significant difference between the mean total support in the depressed and non-depressed group (4.88 ± 1.41 vs 4.50 ± 1.24, $p = .03$).
Conclusion: Type 2 DM patients who had high social support were less depressed, therefore, clinicians managing DM patients should explore the social support enjoyed by such patients to achieve good health outcome.

Keywords: Social support, Depression, Type 2 diabetes Mellitus, Medical Out Patients' clinic

1. INTRODUCTION

Globally, diabetes Mellitus (DM) is increasing in prevalence and it causes enormous burden on the individual, family, health services and the country at large. [1,2] The economic burden of DM is high such that it accounts for 12% of global health expenditure. [3] Three quarters of people with DM live in low and middle income countries. Nigeria has one third of DM burden in Africa with type 2DM accounting for 95% of cases. In Nigeria, more than 95% cases of DM are type 2 DM. [2,3,4] Also, an individual die from DM every six seconds (5.0 million deaths). [3] The World Health Organization (WHO) projects that DM will be the seventh leading cause of death in 2030. [2]

The burden associated with DM diagnosis, demands of managing the disease, burden of self-care behaviours, health cost and risk of diabetic and cardiovascular complications may lead to emotional distress, resulting in a depressive state. [5,6] The relationship between DM and depression has been hypothesized to be bidirectional and both are associated with physiological abnormalities, including activation of the hypothalamic-pituitary-adrenal axis (HPA). [5] The prevalence of depression is significantly higher in patients with Type 2 DM compared with those without DM. [6] Generally, patients with DM are twice more likely to have comorbid depression compared to people without DM. [5,6]

The coexistence of depression in people with DM is associated with significant negative impact in self-care, adherence to medication and diet regimens resulting in poorly controlled DM, an increased risk of complications, higher mortality and decreased quality of life. [5,7] These eventually lead to absenteeism in work place, loss of productivity, increased use of health care resources and increased healthcare costs. [6,7] Among individuals with DM, total health care expenditures for individuals with depression was 4.5 times higher than that for individuals without depression. [6]

The approach to the management of type 2 DM include lifestyle modifications, dietary and pharmacotherapy. [2,4] The goal of management is to achieve good glycaemic control and this could be achieved by adherence to DM self-care and treatment. [2,4] Social support (SS) is a psychosocial factor that affect individuals' adherence with treatment. A high perceived SS contribute to a better glycaemic control, change of negative health behaviours, increase optimism and better health outcome. [8]

Studies in developed countries found that participants having higher levels of social support experienced fewer depressive symptoms and diabetes-related symptoms and that low social support level, is associated with the presence of depression. [8,9] Therefore, to manage an individual with DM, the support of family and other individuals in the social environment is important. However, the level of perceived SS enjoyed by individuals with DM are not routinely assessed by clinicians in developing countries. Thus, the information obtained from this study will provide objective guide for the management of patients with type 2 DM.

2. MATERIALS AND METHODS

2.1 Study setting

Jericho Specialist Hospital (JSH) is located along Magazine road Jericho, Ibadan North West, Local Government area of Oyo State, Nigeria. It is owned by Oyo state Hospital Management Board. It is a 30 bedded secondary health care level hospital being managed by family physicians. The hospital provides primary and secondary levels of care for people of all ages within its catchment area. The General outpatient serves as the point of entry for most patients presenting at JSH with both undifferentiated and differentiated conditions and the Medical outpatient (MOP) clinic for patients with chronic medical illnesses. An average of 3 new and 297 old patients with DM are seen monthly at the MOP clinic.

2.2 Study population

The target population for this study consisted of 273 adult patients ≥40 years with type 2 DM receiving care at the MOP clinic for at least 3months

2.3 Study design

This was a cross-sectional survey of 273 respondents with DM who consented and were recruited from the MOP clinic of the JSH, Ibadan, Oyo State. The data collection was over a period of eight weeks between 1st of August and 30th of September 2017.

2.4 Sample size and sampling method

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Single proportion formula with a 20% prevalence of depression among type 2 DM in previous Nigeria study [10] was used in calculating the sample size. A minimum sample size of 273 was obtained after adjusting for non-response by increasing sample size by 10%. Respondents were recruited by systematic random sampling technique.

2.5 Study Instruments

Data were collected using a semi-structured pre-tested questionnaire to obtain respondents' socio-demographic characteristics, medical history, assess depression and perceived social support. Data

obtained from medical records include history of hypertension, use of anti-hypertensive medications, duration of diabetes and blood glucose controls status.

The participant's blood pressure was checked using Dekamet MK3 sphygmomanometer made by AccosonR in England, with an appropriate cuff size. The blood pressure measurement was done twice at one-minute interval (after five minutes' rest) with the respondents in a calm seated position with arm supported at heart level. Hypertension was diagnosed in addition to the history in medical records if systolic blood pressure ≥130 mmHg or a diastolic blood pressure ≥80 mmHg was gotten on at least two occasions or if the patient was on antihypertensive drugs. [4]

Average blood pressure was obtained from medical record of the last two clinic visits and the blood pressure measured using standardized sphygmomanometers on the day of recruitment. Average fasting blood glucose was obtained from the last two previous clinic visit fasting blood glucose values and the value on the day of recruitment.

Anthropometric measurements, including weight and height were obtained. The respondents were weighed with a standard analogue weighing scale, (PRESTIGE^{R} Mechanical bathroom scale, made in China). The measured weights were to the nearest 0.1kg in light clothing without any other accessories. Standing height of respondents was measured, using a Seca model stadiometer with subject facing forwards, without headgear or footwear and measured to the nearest 0.1 centimeter. It was ensured that participant's heels touched the stadiometer.

Body Mass Index was calculated by dividing the weight in kilograms by the square of the height in meters. BMI was categorized as underweight <18.5kg/m ^{2}, normal of 18.5-24.9 kg/m ^{2}, overweight of 25-29.0 kg/m ^{2} and obese if ≥30 kg/m ^{2}.

Zung's Self Rating Scale (ZSRS) was used to assess depression. ZSRS consists of 20-item questions, each with a 4-point Likert scale answers and the maximum score is 80. Items 2, 5, 6, 11, 12, 14, 16, 17, 18, 20 are reverse scored. Respondents were categorised into depression levels based on their total score. A score of less than 50 denotes no depression; a score of 50 to 59 represents mild depression; a score of 60 to 69 represents moderate depression; and a score of 70 and above indicates severe

depression. [11] Both the Yoruba and English versions of Zung's scale have been validated in Nigeria with good psychometric properties [12] and had been used in Nigeria. [10]

The Multidimensional scale of Perceived Social Support (MPSS) by Zimet et al. was used to assess perceived social support. The MPSS is a 12-item, 7-point Likert scale. It has three social support subscales namely, family (FA), friends (FR) and significant other (SO), each containing 4 items. Items are summed, total score ranges from 12 to 84 and the total score is then divided by 12 to get the mean total scale score. Mean total scale score ranging from 1 to 2.9 is categorized as low support, scores of 3 to 5 is considered moderate support and scores from 5.1 to 7 is categorized as high support. It has been validated in various countries with good internal consistency (Cronbach's alpha = 0.84–0.92), strong test-retest reliability (r = 0.72–0.85) and it had been used in Nigeria. [13,14]

2.6 Data analysis

Statistical Package for Social Sciences (SPSS) version 17 was used for analysis. Continuous variables were summarized as mean and standard deviation. Discrete variables were summarized with proportions, percentages. The comparison of continuous variables was with the independent sample t-test and p values of equal to or less than 0.05 was considered as statistically significant.

3. RESULT

3.1 The profile of the respondents

The profile of the respondents is shown in Table 1. One hundred and fifty-seven subjects (57.5%) of the respondents were ≥ 60 years. The male to female ratio was 1: 5.8. A higher proportion of the respondents 187 (68.5%). were currently married Half (50.5%) of the respondents were diagnosed as having type 2 diabetes mellitus (DM) for less than five years. The median duration of type 2 DM was 4.0years.

Two hundred (73.3%) of the respondents had abnormal body mass index(BMI). The mean BMI of the respondents was 29.5±22.2kg/m2. Two hundred and seventeen (79.5%) of the respondents had hypertension. The mean systolic and diastolic blood pressure of the respondents was 135.5±21.1mmHg and 79.0mmHg respectively. One hundred and forty-one 141 (51.6%) respondents had their blood glucose controlled. The mean fasting blood glucose of the respondents was 119.1± 40.6mg/dl.

143 **Table 1: The profile of the respondents**

144 **(N=273)**

Variables	Frequency (n)	Percentage (%)
Age (years)		
40 – 49	28	10.3
50 – 59	88	32.2
60 and above	157	57.5
Sex		
Male	40	14.7
Female	233	85.3
Marital Status		
Currently Married	187	68.5
Not currently Married	86	31.5
Duration of Diabetes Mellitus		
< 5 years	138	50.5
5 - 9 years	71	26.0
10 years and above	64	23.5
Comorbid Hypertension		
Yes	217	79.5
No	56	20.5
Body Mass Index		
Underweight	3	1.1
Normal weight	73	26.7
Over weight	118	43.3
Obese	79	28.9
Fasting blood glucose control		
Controlled	141	51.6
Uncontrolled	132	48.4

3.2 Perceived social support of respondents

Table 2 shows the perceived social support of the respondents. One hundred and two (37.4%) respondents had high social support, while 153 (56.0%) and 18 (6.6%) had moderate and low social support respectively. Higher proportion of female respondents (57.5%) had moderate social support compared to males (47.5%). Conversely, a higher proportion of male respondents (10.0%) had low social support compared to females (6.0%). The total mean score of the participants for MSPSS was moderate (4.6±1.3). The mean score ±SD for male and female respondents were 4.8 ± 1.4 and 4.6±1.3 respectively.

Majority 212 (77.7%) of the respondents had high social support from the family subscale of the perceived social support while the lowest MPSS scores was from the friend subscale. The mean score of the respondents for family, friends and significant others sub-scale of MSPSS scores were 5.9 ± 1.7, 3.6±2.1 and 4.4±2.1 respectively.

Table 2: Perceived social support of respondents

Variables	**Male=40**	**Female=233**	**Total= 273**
	n (%)	**n (%)**	**N (%)**
Total scale score on MSPSS			
Low social support	4 (10.0)	14 (6.0)	18 (6.6)
Moderate social support	19 (47.5)	134 (57.5)	153 (56.0)
High social support	17 (42.5)	85 (36.5)	102 (37.4)
Family subscale			
Low social support	5 (12.5)	19 (8.1)	24 (8.7)
Moderate social support	3 (7.5)	34 (14.6)	37 (13.6)

High social support	32 (80.0)	180 (77.3)	212 (77.7)
Friend subscale			
Low social support	12 (30.0)	109 (46.8)	121 (44.3)
Moderate social support	15 (37.5)	54 (23.2)	69 (25.3)
High social support	13 (32.5)	70 (30.0)	83 (30.4)
Significant other subscale			
Low social support	10 (25.0)	69 (29.6)	79 (28.9)
Moderate social support	12 (30.0)	59 (25.3)	71 (26.0)
High social support	18 (45.0)	105 (45.1)	123 (45.1)

3.3 Prevalence of depression among respondents

The prevalence of depression among respondents was 27.5% as shown in table 3. Among the respondents that had depression 72 (26.4%) had mild depression while 3 (1.1%) had moderate depression and no case of severe depression was found in the respondents. Higher proportion of female respondents (27.0%) had mild depression compared to males (22.5%). Conversely, a higher proportion of male respondents (2.5%) had moderate depression compared to females (0.9%). The mean ±SD depression score of the respondents was 46.7±5.7. The mean score± SD for male and female respondents were 46.6± 5.7 and 46.7±5.7 respectively. Sadness (78.7%) and sleep disturbances (67.6%) were the most common depressive symptoms reported by the respondents with depression.

Table 3: Pprevalence of Depression among the Respondents

Variables	**Male=40**	**Female=233**	**Total= 273**
	n (%)	**n (%)**	**N (%)**

No Depression	30 (75.0)	168 (72.1)	198 (72.5)
Depression present	10 (25.0)	65 (27.9)	75 (27.5)
Mild depression	9 (22.5)	63 (27.0)	72 (26.4)
Moderate depression	1 (2.5)	2 (0.9)	3 (1.1)

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176 **3.4 Relationship between Depression and Perceived Social support, Disease-related**
177 **Parameters in the respondents**

178 Relationship between depression and perceived social support, the disease-related parameters of the
179 respondents are presented in Table 4. The mean of Systolic and diastolic BP, body mass index and
180 fasting blood glucose were higher among the depressive group than in the non-depressive group,
181 however these differences were not statistically significant. Significant difference was found in the level of
182 social support perceived in respondents with and without depression (t=2.19, *p*=.03). Non-depressed
183 diabetic patients had significantly high mean perceived social support than that of the depressed
184 diabetics.

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187 **Table 4: Disease-related parameters and perceived social support of the respondents with or**
188 **without depression**

	Non-Depressed ZSDS score <50	**Depressed ZSDS score>50**	**t**	**p-value**
Systolic BP(mmHg)	135.86+ 21.37	134.43+20.44	0.499	0.618
Diastolic BP(mmHg)	79.22+14.06	78.48+12.92	0.410	0.682
Fasting blood glucose (mg/dl)	116.81+36.98	126.86+48.37	-1.730	0.086
Body mass index	27.73+5.02	28.61+5.85	-1.238	0.217
Total social support (MPSS)	4.88+1.41	4.50+1.24	-2.187	0.030*

*significant at $p<.05$

BP= blood pressure

4. DISCUSSION

Hypertension is a common co-morbidity among diabetic patients. [4,15] In this study there is a high prevalence of hypertension among the respondents. This is consistent with 71.6% reported by Kayode et al in Lagos, Nigeria. [15] The co-existence of hypertension and DM could be because the pathophysiology of one disease exacerbate the other. Insulin resistance in DM increases renin-angiotensin-aldosterone system which would eventually increase sympathetic nervous system activity that have been implicated in the pathophysiology of hypertension. In addition, hypertension and DM have similar risk factors such as age, obesity and physical inactivity.

Obesity is a risk factor for Type 2 DM. [4] The prevalence of obesity in this study is similar to 26.2% reported by Edo et al. in Benin City, Nigeria. [16] The coexistence of hypertension and obesity in DM patients increases morbidity, mortality and the risk of cardiovascular complications. [4] In this study only half of the respondents had their blood glucose controlled. Thomas et al. found that the prevalence of uncontrolled blood sugar progressively increased with body mass index. [17]

Depression is a common mental disorder among diabetics, it could be due to the bidirectional relationship between depression and type 2 DM. [5] The prevalence of depression in this study is high comparable to some studies. [18,19] However, it is lower than that reported in Parkistan 43.5% and China 56.1%. [20,21] Substantial percentage of the respondents belong to mild category. Absence of severe depression among respondents in this study is consistent with findings by Mikaliukštiene et al. [22] The finding in this study that depression was more common in diabetic women than men is consistent with other studies. [18,20] In Jos, Northern Nigeria, Agbir et al. reported female-to-male ratio of 3:1. [18]

The level of perceived social support (SS) among the participants in this study was high and family was the major source of social support. The kinship system, the extended family system practiced in Nigeria are important contributors to having high family support.

Studies have shown that social support can reduce the negative impact of the diagnosis and treatment of chronic medical conditions such as DM and it may have a positive influence on psychological wellbeing.

[8,9] The reciprocal relationship between social support and depression in this study is consistent with other studies in which people with high social support are less likely to be depressed than those with low social support. [8,9]

This study was carried out at a single site and it was hospital based, so its findings may not be generalized. Also, being cross sectional study cause-effect relationship cannot be ascertained. However, the relationship between social support and depression was determined.

5. CONCLUSION

Given the high prevalence of depression and positive impact of social support on depression among DM patients, there is a need for physicians to explore the social support available to such patients.

COMPETING INTERESTS

There is no conflict of interest

Ethical Considerations

The research protocol was approved by the Ethics Committee of the Oyo State Research Ethical Review Committee (AD13/ 479/ 511), Ministry of Health. Approval was obtained from the Head of the Jericho Specialist Hospital. The researcher explained the purpose and the procedure of the study to the respondents before the interview. All the respondents were informed that their participation was voluntary, and each of the respondents signed an informed consent form. Privacy and confidentiality of the information given was ensured.

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TELEGRAMS..... TELEPHONE.....

MINISTRY OF HEALTH

DEPARTMENT OF PLANNING, RESEARCH & STATISTICS DIVISION

PRIVATE MAIL BAG NO. 5027, OYO STATE OF NIGERIA

Your Ref. No. .....

All communications should be addressed to the Honorable Commissioner quoting

Our Ref. No. AD 13/ 479/ 511

31st July, 2017

The Principal Investigator,
Department of Epidemiology and Medical Statistics,
Faculty of Public Health,
College of Medicine,
University of Ibadan,
Ibadan.

Attention: Ilori Titilayo

ETHICAL APPROVAL FOR THE IMPLEMENTATION
OF YOUR RESEARCH PROPOSAL IN OYO STATE

This is to acknowledge that your Research Proposal titled: "Prevalence and Factors Associated with Depression and Anxiety among Patients with Type 2 Diabetes Mellitus Attending Jericho Specialist Hospital, Ibadan, Oyo State" has been reviewed by the Oyo State Ethical Review Committee.

2. The committee has noted your compliance. In the light of this, I am pleased to convey to you the full approval by the committee for the implementation of the Research Proposal in Oyo State, Nigeria.

3. Please note that the National Code for Health Research Ethics requires you to comply with all institutional guidelines, rules and regulations, in line with this, the Committee will monitor closely and follow up the implementation of the research study. However, the Ministry of Health would like to have a copy of the results and conclusions of findings as this will help in policy making in the health sector.

4. Wishing you all the best.

Dr. Abbas Gbolahan
Director, Planning, Research & Statistics
Secretary, Oyo State, Research Ethical Review Committee