Journal of Advances in Medicine and Medical Research

29(2): 1-8, 2019; Article no.JAMMR.47875
ISSN: 2456-8899
(Past name: British Journal of Medicine and Medical Research, Past ISSN: 2231-0614, NLM ID: 101570965)

Cross-Sectional Study of Impact of Social Support on Depression among Type 2 Diabetics in a Secondary Health Care Facility in Southwest Nigeria

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Authors' contributions

This work was carried out in collaboration between both authors. Author HTI designed the study, performed the statistical analysis, wrote the protocol, and wrote the first draft of the manuscript. Author OAA wrote the protocol, managed the literature searches and managed the analyses of the study. Both authors read and approved the final manuscript.

Article Information

DOI: 10.9734/JAMMR/2019/v29i230060
Editor(s):
(1) Dr. Emin Umit Bagriacik, Director, Immunology Research Center, Gazi University, Faculty of Medicine Department of Immunology Besevler, Turkey.
Reviewers:
(1) Siva Rami Reddy, E Tantia University, India.
(2) Muruganandan Shanmugam, Harvard University, USA.
(3) Hassan A. Shora, Port-Said University & Ismailia General Hospital, Egypt.
Complete Peer review History: http://www.sdiarticle3.com/review-history/47875

Original Research Article

Received 29 November 2018
Accepted 09 March 2019
Published 18 March 2019

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 scale and multidimensional perceived social support scale 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 $p<.05$.

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Results: Half (50.5%) of the respondents were diagnosed in the past 5 years as having type 2 DM, 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 an 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 [1,3]. Nigeria has the highest burden of DM in Africa with type 2DM accounting for 90-95% of cases [1,2,4]. Also, an individual dies 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 impacts 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 includes 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 affects individuals' adherence with treatment. A high perceived SS contributes 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 an 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 the Oyo State Hospitals'

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

Single proportion formula with a 20% prevalence of depression among type 2 DM in a 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 sitting position with the arm supported at heart level. Hypertension was diagnosed in addition to the history in the 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 the medical records 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 visits 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 (BMI) 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 and 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. RESULTS

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 4.0 years.

Two hundred (73.3%) of the respondents had abnormal BMI. The mean BMI of the respondents was 29.5±22.2 kg/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±21.1 mmHg and 79.0 mmHg 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± 40.6 mg/dl.

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.

3.3 Prevalence of Depression among Respondents

The prevalence of depression among respondents was 27.5% as shown in Table 3. Among the respondents with depression 72 (26.4%) had mild 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.

3.4 Relationship between depression and perceived social support, disease-related parameters in the respondents

The relationship between depression and perceived social support, the disease-related parameters of the respondents are presented in Table 4. The mean of Systolic and diastolic BP, BMI and fasting blood glucose were higher among the depressive group than in the non-depressive group. However, these differences were not statistically significant. Significant difference was found in the

level of social support perceived in respondents with and without depression (t=2.19, p=.03). Non-depressed diabetic patients had significantly high mean perceived social support than that of the depressed diabetics.

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%

Table 1. The profile of the respondents

(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

Table 2. Perceived social support of respondents

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

Table 3. Pprevalence of depression among the respondents

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

Table 4. Disease-related parameters and perceived social support of the respondents with or without depression

	Non-depressed ZSRS score <50	Depressed ZSRS 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*

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 BMI [17]. Also, there is a significant relationship between social support and glycaemic control among type 2 diabetic patients [14]. In this study, half of the respondents had moderate social support and half of the respondents had good blood glucose control.

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 lower than that reported in Pakistan 43.5% and China 56.1% [18,19] but higher than that observed previously among Nigerian with type 2 DM by Agbir et al (19.4%) and Ibrahim et al (8.33%) [20,21]. This is due to differences in depression assessment method. In this present study and that conducted in Pakistan and China, a self-report questionnaire was used to assess depression. ZSRS is a self-report screening tool for depression, though it has good psychometric properties [11,12] there may be a risk of misclassification, accounting for the higher prevalence of depression [22,23]. In contrast, 0standardized diagnostic interviews (gold standard) were used by Agbir and Ibrahim [20,21]. The high prevalence of depression in this study could also be because, almost half of the respondents had uncontrolled blood glucose. Depression had been found to be associated with poor glycaemic control among type 2 diabetes patients [24,25]. Crispin-Trebejo et al. found that patients with depression had about 1.3 times greater prevalence of poor glycaemic control than those without depression [25]. However, in this study there was no association found between depression and glycaemic control. In addition, almost half of the respondents were diagnosed of having DM for more than five years. Increased duration of diabetes leads to increased diabetic complications and consequently leads to increased psychological disorders such as depression because chronic complications of DM affect the emotional state of patients [26].

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. [27]. The finding in this study that depression was more common in diabetic women than men is consistent with other studies [18,26]. In Jos, Northern Nigeria, Agbir et al. reported female-to-male ratio of 3:1 [20].

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].

Depression was assessed with a validated instrument for assessing depression in a clinical setting and the study was able to determine the relationship between social support and depression. The findings in this study serve as a baseline information and a guide for the development of interventions for DM patients in Nigeria.

However, the findings from this study should be interpreted with a caution because psychiatric diagnostic interview which is considered as the gold standard for the diagnosis of depression was not used. Also, being a cross sectional study cause-effect relationship cannot be ascertained.

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 and interventions that include family members, friends and significant others should be integrated to patient care to reduce depression in type 2 diabetics. Also, strategies for the treatment of depression in diabetic patients should be developed following the finding of large proportion of the diabetic patients having depressive symptoms in this study.

CONSENT

It is not applicable.

ETHICAL APPROVAL

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.

ACKNOWLEDGEMENT

Dr JO Adeyinka, The Chief Consultant Jericho Specialist Hospital, for the support and permission given to carry out the study.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Oputa RN, Chinenye S. Diabetes Mellitus: A global epidemic with potential solutions. AJDM. 2012;20(2):33-35.
2. World Health Organization. Global report on diabetes. Geneva: World Health Organization; 2016.
Available:https://apps.who.int/iris/bitstream/handle/10665/204871/9789241565257_eng.pdf
Accessed April 12, 2017.
3. International Diabetes Federation. IDF diabetes atlas. 7th Ed. Brussels: International Diabetes Federation; 2015.
4. Diabetes Association of Nigeria (DAN). Clinical Practice Guidelines for Diabetes Management in Nigeria. 2nd Edition; 2013.
Available:www.diabetesnigeria.org
Accessed May 24, 2017.
5. Holt RI, de Groot M, Golden SH. Diabetes and depression. Curr Diab Rep. 2014;14: 491.
6. Egede LE, Zheng D, Simpson K. Comorbid depression is associated with increased health care use and expenditures in individuals with diabetes. Diabetes Care. 2002;25:464–470.
7. Egede LE, Ellis C. Diabetes and depression: Global perspectives. Diabetes Res Clin Pract. 2010;87:302 – 312.
8. Strom JL, Egede LE. The impact of social support on outcomes in adult with type 2 diabetes: A Systematic Review. Curr Diab Rep. 2012;12(6):769–781.
9. Zhang W, Xu H, Zhao S Yin S, Wang Z, Guo J, et al. Prevalence and influencing factors of co-morbid depression in patients

with type 2 diabetes mellitus: A General Hospital based study. Diabetology & Metabolic Syndrome. 2015;7:60.
10. Mosaku K, Kolawole B, Mume C, Ikem R. Depression, Anxiety and quality of life among diabetic patients: A comparative study J Natl Med Assoc. 2008;100.173-178.
11. Zung WWK. A self-rating depression scale. Arch Gen Psychiatry. 1965;2:63-70.
12. Jegede RO. Psychometric characteristics of Yoruba Version of Zung's Self Rating Depression Scale and Self Rating Anxiety Scale. Afri J Med Med Sci. 1979;8(3-4): 133-137.
13. Zimet GD, Dahlem NW, Zimet SG, Farley GK. The Multidimensional Scale of Perceived Social Support. J Pers Assess. 1988;52(1):30–41.
14. Odume BB, Ofoegbu OS, Aniwada EC, Okechukwu EF. The influence of family characteristics on glycaemic control among adult patients with type 2 diabetes mellitus attending the general outpatient clinic. National Hospital, Abuja, Nigeria. South Afri Fam Pract. 2015;57(6):347-352.
15. Kayode OO, Odukoya OO, Odeniyi IA, Olopade OB, Fasanmade OA. Pattern of complications and comorbidities among diabetic patients in a tertiary healthcare center in Nigeria. J Clin Sci. 2015;12:29-35.
16. Edo AE, Edo GO. Clinical and biochemical characteristics of newly diagnosed diabetics in South-South Nigeria. Niger J Basic Clin Sci. 2016;13:19-22.
17. Thomas F, Bean K, Pannier B Oppert JM, Guize L, Benetos A, et al. Cardiovascular mortality in overweight subjects: The key role of associated risk factors. Hypertension. 2005;46:654-9.
18. Khuwaja AK, Lalani S, Dhanani R Azam IS, Rafique G, White F, et al. Anxiety and depression among outpatients with type 2 diabetes: A multi-centre study of prevalence and associated factors. Diabetol Metab Syndr. 2010;2:72.
19. Sun N, Lou P, Shang Y, Zhang P, Wang J, Chang G, et al. Prevalence and determinants of depressive and anxiety symptoms in adults with type 2 diabetes in China: A cross-sectional study. BMJ Open. 2016;6(8):e012540.
20. Agbir MT, Audu MD, Adebowale TO, Goar SG. Clinical correlates of depression among Diabetics in Jos, Nigeria. J Med Tropic. 2010;12:37-41.
21. Ibrahim A, Mubi B, Omeiza, B Wakil M, Rabbebe I, Jidda M, et al. An assessment of depression and quality of life among adults with diabetes mellitus in the University of Maiduguri Teaching Hospital. The Internet Journal of Psychiatry. 2013; 2(1).
22. Hedayati SS, Bosworth HB, Kuchibhatla[5] M, Kimmel PL, Szczech LA. The predictive value of self-report scales compared with physician diagnosis of depression in hemodialysis patients. Kidney Int. 2006; 69(9):1662-1668.
23. Dunstan DA, Scott N, Todd AK. Screening for anxiety and depression: Reassessing the utility of the Zung scales. BMC Psychiatry. 2017;17:329.
24. Hall KK, Tambekou J, Penn L, Camara A, Balde NB, Sobngwi E. Association between depression, glycaemic control and the prevalence of diabetic retinopathy in a diabetic population in Cameroon. S Afr J Psychiatr. 2017;23:983.
25. Crispín-Trebejo B, Robles-Cuadros MC, Bernabé-Ortiz MA. Association between depression and glycemic control among type 2 diabetes patients in Lima, Peru. Asia Pac Psychiatry. 2015;7(4):419–426.
26. Alduraywish AA, AlAnazi FM, Alharbi MA Al-rasheed FM, Alaithan LT. Correlation among the glycemic control and lipogram indices with chronic complications in Saudi diabetic patients: Al-Jouf Status. Aljouf Univ Med J. 2015;(3):9-24.
27. Mikaliukštiene A, Žagminas K, Juozulynas A, Narkauskaite L, Salyga, J, Jankauskiene K, et al. Prevalence and determinants of anxiety and depression symptoms in patients with type 2 diabetes in Lithuania. Med Sci. Monit. 2014;20:182-190.

Peer-review history:
The peer review history for this paper can be accessed here:
http://www.sdiarticle3.com/review-history/47875