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NUTRITIONAL STATUS, KNOWLEDGE, AND PRACTICE OF SELF-CARE MANAGEMENT AMONG DIABETIC PATIENTS IN OSUN STATE, NIGERIA

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Abstract

This study assessed the nutritional status, knowledge, and practice of self-care management among individuals living with diabetes in Osun State. The outcome of this study may stimulate the development of education programs on the dietary aspect of self-care management of diabetes. A cross-sectional descriptive survey design was used to study a sample of 80 diabetic patients among members of the Diabetic Association of Nigeria in Osogbo, Osun State. A validated interviewer-administered questionnaire was used to obtain data on socio-demographic characteristics, knowledge, and practice of self-care management. Fasting blood glucose and anthropometric characteristics were assessed using standard procedures. Data were analyzed using descriptive and Chi Square was used to determine associations between variables. Results were presented in frequencies, percentages, means, and standard deviations. The mean age of the respondents was 64.3 ± 10 years, 53% were female, 43.8% had completed tertiary education and 78.8% of the respondents lived in urban areas. More than half (57.5%) of the respondents were overweight and obese and 32.5% had Fasting blood glucose (FBG) beyond the targeted range. 21.3% and 17.5% had poor knowledge and practice of self-care management respectively and there was no significant relationship between the practice of self-care management and the blood glucose level of the respondents at P=0.12. There is a gap in knowledge and practice of self-care management among

the respondents. Therefore, a multidisciplinary team, including dietitians, doctors, nurses, and psychologists, is needed to provide comprehensive education and support for people living with diabetes in managing their self-care.

Keywords: Diabetes, Knowledge, Nutritional status, Self-care, Practice.

Introduction

Nutrition is one the most important factors for existence on the earth. With adequate nutrition, most diseases can be prevented or managed effectively to reduce mortality and morbidity rates (Food and Agriculture Organization of the United Nations (FAO) and World Health Organization (WHO). 2019). Diabetes disables, strikes people at their most productive age, impoverishing families, or reducing the life expectancy of older people (International Diabetes Federation. The IDF. 2017). Globally, estimates by the International Diabetes Federation show that the population of people with diabetes is expected to rise from 415 million in 2015to 642 million by 2040 (IDF, 2015). The prevalence of type 2 diabetes mellitus has been high and still increasing, with Nigeria widely reported as having Africa's highest burden of diabetes with about 3.1 million people living with diabetes (Ogbera, & Ekpebegh, 2014; Uloko et al., 2018).

Type 2 diabetes mellitus is greatly associated with lifestyle modification in which nutrition is integral; other lifestyle practices include physical activities, medication, and blood glucose monitoring (Galaviz et al., 2015). Good management through a multidisciplinary team using a standardized protocol that includes interventions to promote healthy lifestyles; patient education to facilitate self-care; and regular screening for early detection and treatment of complications can potentially prevent complications and premature death from diabetes (WHO, 2016). In managing any disease condition and achieving better compliance with medical therapy, knowledge, and practices have been identified as essential requirements (Yeh, et al., 2018).

In many developing countries, poor knowledge related to diabetes management has been reported. It was reported that knowledge and self-care management regarding diabetes mellitus were insufficient among people with diabetes (Mohammadi, et al., 2015). In Nigeria, there is an erroneous belief amongst many people that diabetes mellitus results from eating carbohydrates hence the popular view that people with diabetes mellitus should either completely avoid carbohydrates or at best take minimal quantities (Asif, 2014; Oyesanya, et al., 2022).Therefore, stakeholders involved in diabetes care should encourage patients to understand the importance of

diet which may help in disease management, appropriate self-care, and better quality of life (Sami, et al., 2017).

Self-dietary management has been defined as an integral step in the management of diabetes (American Diabetes Association 2015). Diabetes self-management education (DSME) is the process that facilitates the knowledge, skill, and ability necessary for diabetes self-care (Powers et al., 2015). Different food choices and dietary behaviours resulting from poor knowledge of food choices, portion sizes, sedentary lifestyles, and fast-food culture influence the nutritional status and self-care management of people with diabetes. A study reported that more than half of the people with diabetes had not modified their dietary patterns, reduced their weight, and performed exercise (Powers et al., 2015). People with diabetes often over eat and become obese due to the cell's resistance to insulin (Adebisi, 2013). Education and empowerment programs are the basis for achieving optimal glycemic control and avoiding diabetes complications through increasing the patient's knowledge of the treatment methods and effective behavioural and self-management techniques (Williams et al., 2014; Xu, et al., 2014). It was observed that diabetes awareness and management among people with diabetes are still the major challenges faced by stakeholders worldwide (Sami et al., 2017). The specific objective of this study is to assess the nutritional status, glycemic control, knowledge and self care practices of the members of Diabetic association, Osogbo, Osun – State, Nigeria.

Methods

The study was carried out in the state Chapter of the Diabetic Association of Nigeria (DAN), Osun state, Southwest Nigeria. DAN was founded over 2 decades and 6 years ago, with 36 chapters in each state in Nigeria. The members are people living with Diabetes Mellitus. They are in partnership with some professional bodies that has to do with the management of Diabetes Mellitus. They were selected as a representative population of diabetes since the association attracts members from different parts of the state. This study is a descriptive and cross-sectional study design and the study population was members present at the meeting on the set date for data collection. The sample size was obtained using Fisher's formula (20). $n = Z^2{}_{1-\propto/2} P(1-P)/\, d^2$. n= the desired sample size, z= the standard normal deviate, usually set as 1.96 which corresponds to 95% confidence, the degree of accuracy desired set at 0.05, p= prevalence rate of diabetes mellitus, In South Western Nigeria the prevalence of diabetes was reported as 4.6% (5). Therefore, the calculated sample size is 67. An adjustment was made for non-response at 10%. q =n/ 1 – f. where

q is the adjustment factor and f is the estimated non-response rate. q = n/ 1- 0.1 = n/0.9 respondents. q= 67/0.9. The calculated sample size for the study is 74 and rounded off to 80. An interviewer-administered questionnaire was used to obtain information from the respondents by trained research assistants during meeting scheduled for members eligible and willing to participate. The questionnaire consists of 3 sections (A-C): Section A, socio-demographic data; Section B contains the anthropometric data of the respondents, which include the weight, height and BMI used to assess the patient's nutritional status. Section C contained the Fasting blood glucose measurement of the respondents. The demographic and socioeconomic characteristics of the respondents were assessed using a well-structured and validated questionnaire.

The height was taken using the height meter while the bathroom weighing scale was used to measure the weight after ensuring that no excess weight was present on the respondent's body. The body mass index (BMI) was calculated from the measurements and classified according to standards (WHO, 2010; Food and Nutrition Technical Assistance III Project (FANTA 2016). The fasting blood sugar was done using the standard procedure described the by American Diabetes Association [ADA] (American Diabetes Association, 2017). Measurements were taken after an overnight fast by the respondents using a portable glucometer supplied by the researcher, and the readings were taken and recorded immediately by inserting the strips containing each respondent's blood samples into the glucometer. The glycemic control was classified into good or poor glycemic control at a level ≥ 7.0 mmol/L (126 mg/dl) and the recommended target blood glucose level ranges of 4-7mmol/L among type 2 DM patients (ADA, 2017 and WHO, 2019) . The Body Mass Index was classified according to the WHO classification of BMI; <18.5kg/m^2 = underweight, 18.5-24.99kg/m^2 = normal weight, 25-29.99kg/m^2 = overweight, and >29.99kg/m^2 = obesity.

The questionnaire on Knowledge and self-care practices was adapted from DSMQ (Diabetes self-care management Questionnaire) with some adjustments to suit the culture and practices in Osun State and Nigeria (Schmitt et al., 2016). The Questionnaire for Self-Care Practices assessed the practice of self-care management among the patients, it has 23 statements that described self-care activities related to diabetes and each person specified the extent to which each statement applies to him or her in the last month. The Questionnaire for knowledge of self-care management also has 23 statements that contain both false and true statements about diabetes self-care management, and each person is required to tick whether the statement is true or false. During analysis, each correct response was assigned a score of 1, and each incorrect response was assigned a score of 0. Thus, for

23 items for knowledge, the maximum attainable score was 23 and the minimum score was 0. For the Practice of Self-care Practices Questionnaire. The items were presented on a 4-point scale rated from 0-applies to me very much to 3 – does not apply to me. Negatively worded statements were scored in reverse order. Practice sections were classed into four categories namely; general practice, dietary practice, exercise, and foot care practices, and were all scored alike. The highest composite score for practice of self-care management was 69 and the minimum composite score was 0. The knowledge score was rated good (17-23), average (9-16), and poor (scores ≤8). The attitude score was rated good (46-69), average (23-45), and poor (≤23). The instrument was validated through content validity and language adaption. Local diabetes care experts, including endocrinologists, dietitians, and health educators, were consulted to assess the relevance and appropriateness of the questionnaire items for the Osun State population. The reliability of the instrument was tested in Ladoke Akintola University Teaching Hospital, Osogbo, on 20 patients who were not part of the study. Internal consistency reliability was evaluated using coefficient alpha (Cronbach's alpha) method, the value was 0.74. The instrument was accepted as reliable for data collection. Data collected were checked for accuracy and completeness. Statistical Package for Social Sciences (SPSS) version 20.0 was used for the analysis and data was presented in percentages, frequencies, means, and standard deviation. Categorical variables were summarized by frequencies, means and percentages. The Chi-square test was used to assess the association between the predictor variables at 0.05 level of significance.

Results

Table 1 below revealed that half(50%) of the respondents were between the ages of 55-69 years, more than half (52.5%) were females, they were majorly (82.5%) married, close to three quarter (68.8%) were Christians and all of them (100%) were of Yoruba ethnicity. The majority (78.8%) of the respondents were urban dwellers, about 44% were graduates and 12% had no formal education. Furthermore, more than one-third(38%) of the respondents were retirees while 17.5% were civil servants. About 27% were in private business. 42.5% of the respondents earned ₦20,000 - ₦49,999 average monthly income, while about one-fifth (21.25%) earned more than ₦50,000 monthly.

Table 1: Demographic and Socio-Economic Characteristics of the Respondents

Characteristics	Frequency (N=80)	Percentage
Age		
40-54 years	15	18.80
55-69 years	40	50.00

70 years & above	25	31.30
Gender		
Male	38	47.50
Female	42	52.50
Marital Status		
Single	1	1.25
Married	66	82.50
Widowed	11	13.75
Divorced	2	2.50
Religion		
Christianity	55	68.75
Islam	25	31.25
Ethnicity		
Yoruba	80	100.00
Place of Residence		
Urban	63	78.75
Sub-Urban	15	18.75
Rural	2	2.50
Educational Level		
No Formal Education	10	12.50
Primary	11	13.75
Secondary	24	30.00
Tertiary	35	43.75
Occupation		
Not Employed	5	6.30
Farmer	4	5.00
Civil Servant	14	17.50
Private Business	22	27.50
Retirees	31	38.80
Others	4	5.00
AverageMonthlyIncome		
Below ₦20,000	29	36.25
₦20,000- ₦49,999	34	42.50
₦50,000 and above	17	21.25

Figure 1 below shows that 40% of the respondents were overweight, 38.8% had normal weight and 17.5% were obese. The result showed that 57.5% of the respondents had a normal healthy weight.

Figure 1: Nutritional status of the respondents

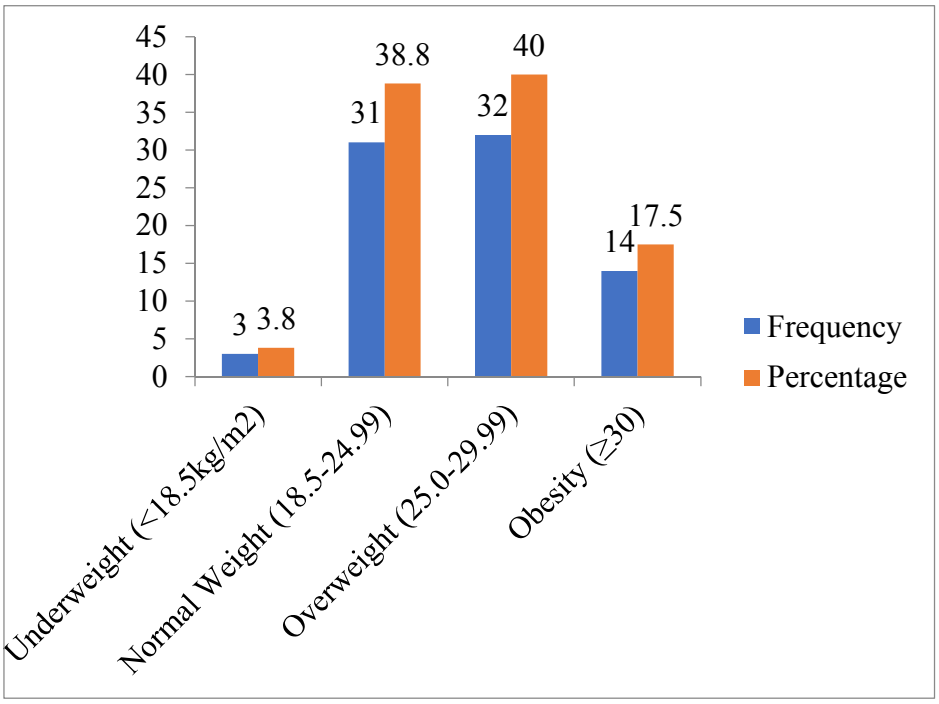

Figure 2 below described the level of glycemic control among type 2 diabetes mellitus patients. About one-third of the respondents had fasting blood sugar above the targeted range (4-7mmol/l) while the majority had FBS within the targeted range.

Figure 2: Fasting Blood Sugar Level of the respondents

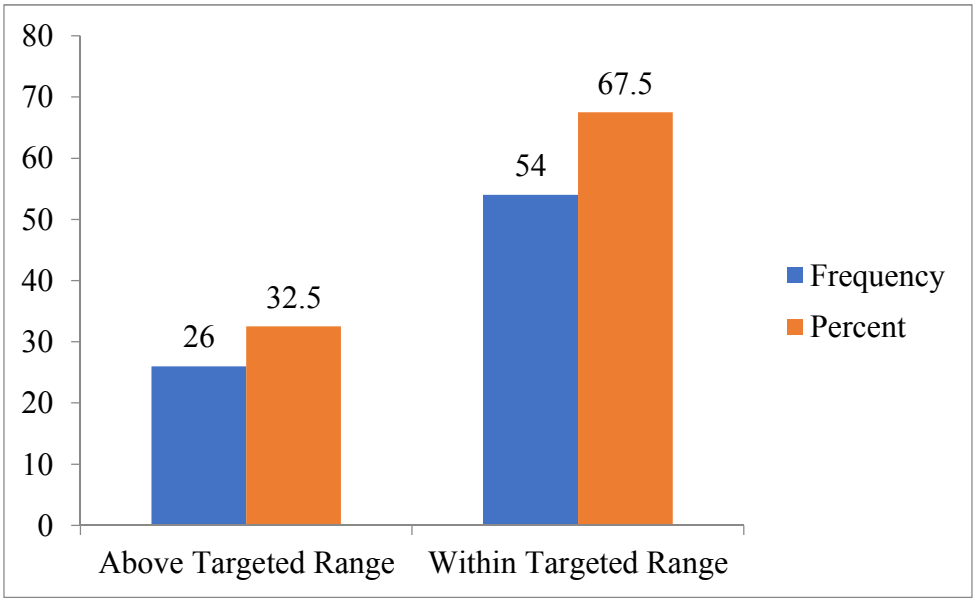

Figure 3 below depicts the level of knowledge of self-care management of the respondents. Most (61.3%) of the respondents displayed average knowledge while just 17.5% had good knowledge of self-care management.

Figure 3: Respondents' Level of Knowledge of Self-care Management

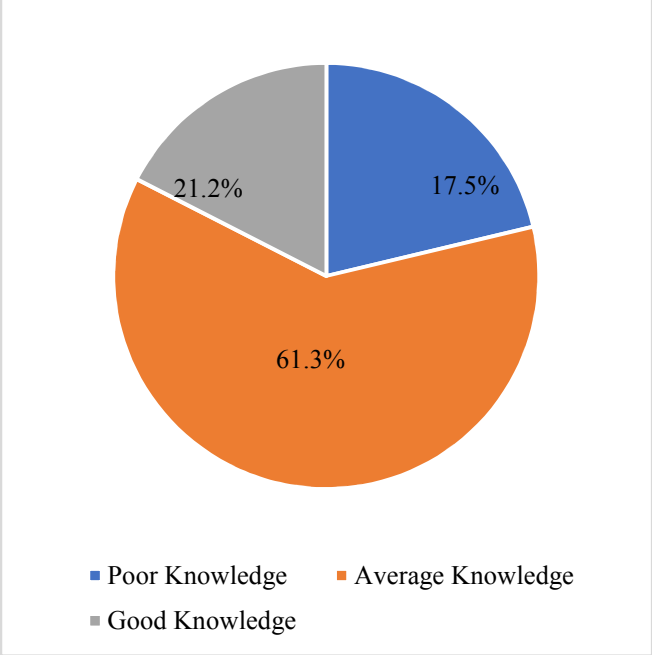

Figure 4 describes the respondents' practice of self-care management. 62.5% of the respondents manifested average practice of self-care management. While one-fifth (20%) had good practice, only 17.5% displayed poor practice.

Figure 4: Respondents' Level of Practice in Self-care Management

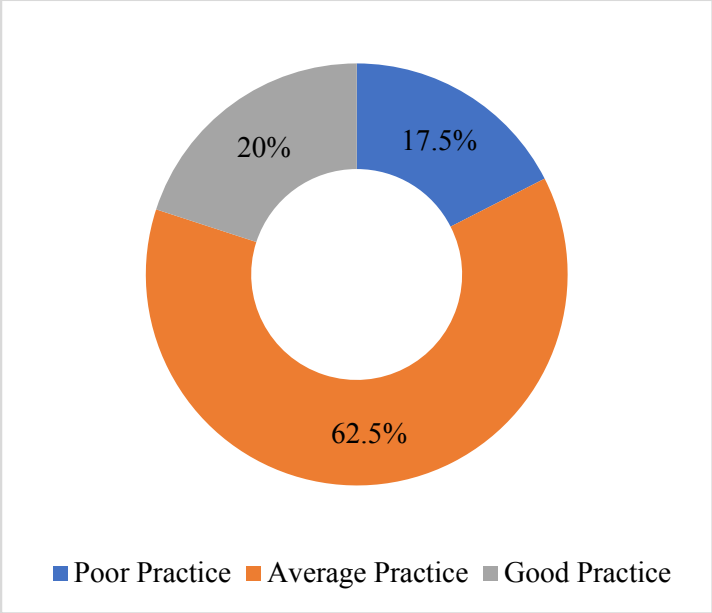

Table 2 describes the relationship between the blood glucose control and the practice of self-care management of the respondents. The majority of the respondents with a poor level of practice of self-care management had their fasting blood glucose at a diabetic level, most of those with average practice had their fasting blood glucose at a pre-diabetic level, while the fasting blood glucose of the respondents with good knowledge was majorly at normal or diabetic levels (36.4% each). However, the p-value of the chi-square test was 0.12. This depicts that there is no statistically significant relationship between blood glucose control and the practice of self-care management of type 2 diabetic patients.

Table 2: Relationship between Levels of Practice of Self-care Management and Levels of Fasting Blood Sugar of the respondents

Level of the practice of self-care management	Levels of FBS			Statistics	
	Normal N (%)	Pre-diabetic N (%)	Diabetic N (%)	x^2	p-value
Poor	5 (35.7)	2 (14.3)	7 (50.0)	7.13	0.12
Average	15 (30.0)	20 (40.0)	15 (30.0)		
good	4 (36.4)	3 (27.2)	4 (36.4)		
Total	**29 (36.2)**	**25 (31.2)**	**26 (32.5)**		

Discussion

Good knowledge and practice of self-care management are prerequisites to achieving optimal glycemic control and preventing diabetes complications. This study, therefore, assessed the nutritional status, knowledge, and practice of self-management care among diabetes patients in Osun State. The result reported a mean age of 64.3 ± 10 years, poor nutritional status, good glycemic control, and average knowledge and practice of self-care management. However, there is no significant relationship between the level of practice of self-care management and the blood glucose level of the respondents in this study.

This study revealed that the mean age of the respondents was 64.3 ± 10 years; about half of them (53%) were female. The mean age in the present study is in line with the International Diabetes Federation which reported that the greatest numbers of people with diabetes are between 40-59 years (IDF, 2017). This aligns with the mean age of 57±9 years reported by Schmitt et al., (2016).

Similar socio-demographic characteristics for gender were reported in a study that assessed the nutritional status of type 2 diabetic patients in Ogun state, Nigeria. Saleh et al., (2012), in a study that assessed knowledge and self-care practices regarding diabetes among newly diagnosed type 2 diabetics in Bangladesh reported that females accounted for 53% of the study population. In addition, there was also a higher percentage of females (54.28%) than males (45.71%) in a similar study in Bangalore (Jeeva & Babu 2016). In contrast, Ali, et al. (2023) in a study that assessed overall clinical features of type-2-diabetes mellitus concerning gender reported there were more male (52.5%) than female (47.5%) respondents. Although global overall diabetes prevalence has been reported to be higher in men, there are more women with diabetes than men in this study and the cited studies, probably due to the combined effect of a greater number of elderly women than men in most populations and the increasing prevalence of diabetes with age (Jackson et al., 2014). This study also consisted mainly of urban dwellers (78.75%) and those with tertiary educational status (43.75%), contrary to the findings of Saleh[26]that recorded 47% for urban dwellers and 17% for those with tertiary education. The difference could be due to variations in the study setting. While the previous study was conducted in a clinical setting using newly diagnosed patients, this present study used already diagnosed patients who had formed a group. Membership of such a group is expected to be largely informed by factors such as location of residence, access to information, and educational, and income status of the respondents. As a result, urban dwellers and people of high educational standards may populate diabetics associations better than rural dwellers.

A profound education on measures to reduce Body Mass Index to within a normal range is an essential life-saving and health-promoting strategy among people with diabetes. The nutritional status of the respondents in this study showed that there is a high prevalence of Overweight and Obesity among the studied respondents. Similar studies have also reported a high prevalence of Overweight and Obesity among people with diabetes with more than half of the respondents being overweight and obese (Hajwal & Salma 2016). This implies that overweight and obesity could be the risk factor for diabetes among the study respondents. The majority of the respondents in this present study had their FBG within the normal range (4-7mmol/L). However, a significant proportion had values above the targeted range for optimal glycemic control. The respondents in this study had good glycemic control compared to the respondents reported in Niger Delta where 55% of the respondents had poor glycemic control (Ufuoma et al., 2016). This difference may be explained by the differences in characteristics of the study populations and study settings. This present study used patients in the Diabetic association group who are expected to have had some

basic education regarding monitoring of blood glucose levels to achieve an optimal status. In contrast, the studies quoted above drew participants from the outpatient clinic of a tertiary hospital.

Adequate self-care knowledge and practice have been reported to be associated with positive outcomes in slowing down the development and progression of complications among people with diabetes (Padma et al., 2012; Mukeshimana et al., 2015). However, only a few had good knowledge and practice of self-care management in this study. This could suggest that, though the members of the association are willing to learn and practice self-care management, there is inadequate emphasis on self-care management in the study population. However, the relationship between the level of practice of self-care management and the blood glucose level of the respondents in this study is not statistically significant. This was similar to a report from similar study in Osun state where the knowledge, practices and adherence to certain self-care practices were not statistically significant (Arogundade & Salawu 2022).

In a similar study that assessed the knowledge of self-care management among people with type-2 diabetes in Cross River State and Akwa Ibom State reported a high knowledge level among the respondents but the study does not assess the practice of self-care management by the respondents (Jackson et al., 2014). A similar study in Rwanda identified some gaps in the knowledge and practice of people living with diabetes (Mukeshimana et al., 2015).

This study is however carried out among members of the Diabetes Association in the study population who are aware of their condition and on therapy. Additionally, participants may have varying levels of knowledge, engagement in self-care management, or access to healthcare compared to diabetic patients who are not part of the association. These differences may impact the generalizability of our findings and should be considered when interpreting the results.

Conclusion

This study has been able to identify gaps in the knowledge and practice of self-care management of people living with diabetes and the nutritional status revealed a high prevalence of Overweight and Obesity in the study population. There is a need for collaboration between multidisciplinary teams, including dietitians, doctors, nurses, and psychologists, to provide comprehensive education and support for people living with diabetes in managing their self-care.

List of abbreviations

BMI: Body Mass Index

DM : Diabetes Mellitus

DSMQ: Diabetes self-care management Questionnaire

ADA : American Diabetes Association,

WHO : World health Organisation

FBG : Fasting Blood Glucose

Declarations

Ethical approval with reference number LTH/EC/2018/03/358 was obtained from the Ethical Committee of Ladoke Akintola University Teaching Hospital Osogbo.Osun State. Respondents signed a detailed informed consent form.

Consent for publication

The authors hereby give consent for the publication of our work under the creative commons CC Attribution-Non-commercial 4.0 license.

Availability of data and materials

All data used for this study are available upon request through the correspondence author.

Authors contributions

POO designed the study, literature review and manuscript writing, JKO and NFU performed data analysis, POO wrote the initial draft, IOD, IAA and OOC reviewed the draft while the final draft was approved by all the authors.

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Competing interests

Authors declare no competing interest.

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