Research Article

Knowledge of Diabetes Mellitus and Adherence to treatment among patients with Type-2 diabetes mellitus attending a Tertiary Facility in Southern Nigeria

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Abstract

Poor knowledge of DM and suboptimal level of adherence to treatment regimen remains a recurring problem among DM patients. Improving the knowledge of DM and adherence to treatment regimen would help in reducing the rate of morbidity and mortality among patients. This study was designed to assess the knowledge of Diabetes Mellitus and adherence to treatment among patients with Type-2 diabetes mellitus attending Niger Delta University Teaching Hospital Okolobri, Bayelsa State Nigeria. This was a descriptive cross sectional study conducted among 140 purposively selected T2DM patients. A validated questionnaire comprising socio-demographic characteristics, knowledge of DM, adherence to treatment was used to collect the data. The collected data were entered into IBM SPSS 17.0 and were analysed using descriptive and inferential statistics with level of significance set at 0.05. The result shows majority of the respondents were females 74(59.2%) and 42(33.6%) were in age group 45-49 years. Majority, of the respondents 78(62.4%) defined DM as a chronic disease in which blood glucose is too high while 81(64.8%) erroneously affirmed that DM could be cured and 99(79.2%) affirmed not to know the symptoms of DM. Only 58(46.4%) of the respondents strictly adhered to treatment and significant socio-demographic predictors of strict adherence to treatment were female (AOR=2.347 95% CI 1.132-4.866), elderly 60-64 (AOR=5.833 95% CI 1.119-30.403), and married (AOR=7.917 95% CI 1.582-39.610). The study showed poor knowledge and suboptimal adherence to treatment among the study participants. Therefore strategies for improving the knowledge of DM and adherence to treatment should be prioritised by the health care system.

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Introduction

Diabetes Mellitus (DM) a metabolic disorder of the pancreas has emerged as one of the public health challenges in recent times. Of the three major types of DM, type-2 diabetes mellitus (T2DM) has emerged as the most prevalent accounting for between 85 to 95% of all DM cases worldwide.[1]

T2DM is the leading cause of microvascular and macrovascular diabetes related complications such as blindness, lower limb amputations, CVA, and death.[2] In addition, T2DM and its complications have continuously impacted negatively on the economic and social life of individuals, families, health systems and countries.[2] Factors identified globally to be significantly associated with adherence to treatment include

knowledge of T2DM and patient level of education.[3] However, notwithstanding the increasing prevalence of DM especially T2DM awareness and knowledge of the ailment appears to be poor among patients in Nigeria. Studies carried out across Nigeria shows interviewed patients lack proper knowledge of DM.[4-6] Increasing patients' knowledge of DM is directly proportional to adequate adherence to treatment regimen and declining complications associated with DM.[7-9] Thus, poor knowledge of DM increases the probability of non-adherence to medication and treatment which has continued to mitigate the objective of achieving optimum glycaemic control among DM patients in developing countries.[2-3] Poor adherence to DM treatment regimen has been associated with insufficient glycaemic control, increased use of medical resources and costs, and higher mortality rates.[10-12] Adherence to treatment has become a major challenge among diabetic patients because the disease requires long term therapies and daily self-management to prevent or delay the development of complications.[13] About 11% of hospital admissions and 40% of nursing home admissions are due to lack of adherence with medication therapy.[13] Medication and dietary adherence problems are common in individuals with diabetes, making glycaemic control difficult to attain.[14] In Nigeria, the problem of non-adherence to medication has led to high morbidity and gradually rising mortality among diabetic patients, especially among the elderly. Therefore, due to the interrelationship between knowledge of diabetes and adherence to diabetes treatment regimen in diabetes prevention and health promotion;

it has become pertinent in a low resource setting like Nigeria to determine the knowledge of diabetes mellitus and the level of adherence to diabetes treatment. This will expand the understanding of the management of the disease and contribute to the long-term reduction of the disease burden in the country.

Study objectives

- To assess the knowledge of DM among the respondents
- To determine the adherence to treatment among the respondents
- To identify the socio-demographic factors predicting adherence to treatment among the respondents

Methods

Study design

The study utilised a descriptive cross sectional design.

Study area

Niger Delta University Teaching Hospital (NDUTH), Okolobri, Bayelsa State, Nigeria. It is the teaching hospital of the Niger Delta University with its main campus in Amassoma.

Study population

The study focused on patients in the Out Patient Department 35 years or older diagnosed with T2DM attending NDUTH.

Inclusion criteria

The main inclusion criteria were: having T2DM, aged at least 35 years, attending the diabetic clinic during the study period and giving informed consent to participate in the study.

Exclusion criteria

The exclusion criteria were: people with type-1 diabetes mellitus, Age less than 35 years, non T2DM clinic attendants and those not giving informed consent to participate in the study.

Sample size determination

The minimum sample size was calculated based on the Yaro Yamane's formula for sample size determination for estimating proportion in a finite population.[14]

$n=(z^2pq)/d^2$

n=the minimum sample size

z=1.96 at 95% confidence interval obtained from statistical table of normal distribution.

P=5.4% i.e. Knowledge of DM.[4]

q=1.0-p=1-0.054=0.946

d=degree of accuracy desired (0.05)

$n=(1.962 \times 0.054 \times 0.946)/0.05^2$

n=78

However to increase the sample size data was collected from 140 T2DM patients.

Sampling procedures

Purposive sampling was used to collect data from the respondents who met the inclusion criteria of having type-2 diabetes, >35 years and giving informed consent to participate in the study.

Instrument for data collection

An interviewer-administered questionnaire was used to collect the data. The instrument was adapted from that of a previous study.[13] Questions on the instrument covered socio-demographic characteristics, Knowledge of Diabetes mellitus, and adherence to treatment.

Method of data collection

Research site was assessed before the method for data collection was designed. Data were collected from June-August, 2018 using interviewer administered questionnaire. The questionnaire was written in English language. The questionnaire comprised close ended and open ended questions. A total of 140 questionnaires were administered, of which 125 were duly returned giving a response rate of 89.3%. The questionnaires were administered on diabetic clinic days and respondents consented to be interviewed after being duly informed about the study.

Data analysis

The collected data was initially sorted out, coded manually, entered into the computer and analysed with SPSS version 17.0. Frequency distribution and Logistic regression was performed to test for associations between the variables of interest. The results were used to draw inferences. The Cronbachs Alpha test reliability was used to determine the reliability of the instrument. The Cronbachs Alpha Reliability Statistics gave 0.862.

Scales of measurements

The level of adherence to treatment was assessed by posing questions on how patients take their medications and follow dietary instructions in relation to medical or health advice. A total of twelve (12) questions were asked and two (2) points were allocated to every appropriately correct answers and one (1) point to every fairly correct answers; thus bringing the total points to twenty-two (24). Subsequently the points were categorized between 0-13 as Code 1 and >13-24 as Code 2. Respondents that score between 0-13=Code 1 were adjudged as partially adhering to treatment, and >13-24=Code 2 as strictly adhering to treatment.

Ethical consideration

Ethical clearance was obtained from the Department of Public and Community Health, Novena University and the management of the Niger Delta University Teaching Hospital.

Results

Socio-demographic characteristics of the respondents

According to Table 1, out of the 125 respondents 74(59.2%) were females while 42(33.6%) of the respondents were in 45-49 years age group and 49(39.2%) were married.

Table 1: Socio-demographic characteristics of respondents

Variable	Indicator	Frequency	Percent (%)
Sex	Female	74	59.2
	Male	51	40.8
	35-39	7	5.6
	40-44	12	9.6
Age (years)	45-49	42	33.6
	50-54	33	26.4
	55-59	21	16.8
	60-64	10	8
	Christianity	97	77.6
Religion	Islam	11	8.8
	Traditional	17	13.6
	None	0	0
	Single	9	7.2
Marital status	Married	49	39.2
	Divorced	17	13.6
	Widow	13	10.4
	Separated	37	29.6
	No formal Education	14	11.2
	Primary	25	20
Level of Education	Secondary	56	44.8
	HND/Bachelor	22	17.6
	Postgraduate	8	6.4
	Trader	47	37.6
Occupation	Civil servant	44	35.2
	Oil worker	24	19.2
	Others	10	8

Knowledge of type-2 diabetes mellitus

From the Table 2, majority 78(62.4%) of the respondents indicated that DM is a chronic disease in which blood glucose is too high and 81(64.5%) affirmed that DM can be cured.

From Table 3, majority of the respondents 58(46.6%) did not know what causes DM, 99 (79.2%) of the respondents did not know symptoms of DM and 101 (80.8%) did not know that if DM is not well managed it causes serious complications. About 49(37.6%) of the respondents could identify the causes of DM, 24(19.2%) could identify the symptoms of DM, and while very low proportion 15(12.2%) of the respondents were aware of the complications.

Table 2: Level of Knowledge of DM

Question	Responses	Frequency	Percent (%)
Diabetes is a chronic disease in which blood glucose is too high	Yes	78	62.4
	No	47	37.6
Is diabetes hereditary?	Yes	56	44.8
	No	69	55.2
Can diabetes be cured?	Yes	81	64.8
	No	44	35.2

Level of Adherence to treatment

Figure 1 shows that a larger percentage of the respondents 67(53.6%) partially adhered to their treatment regimen, while strict adherence was observed among 58(46.4%) of the respondents.

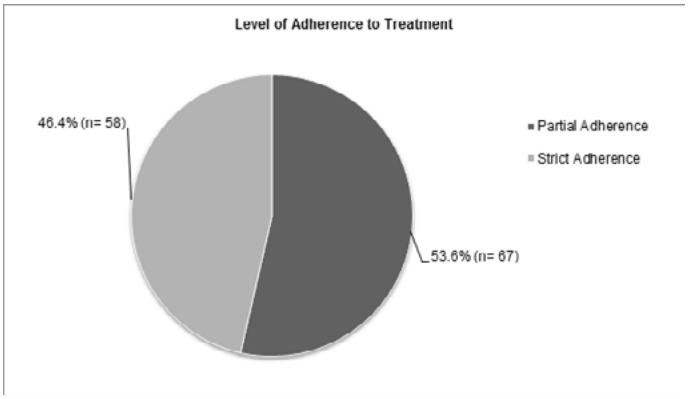

Figure 1: Level of adherence to treatment among the respondents

The multiple logistic regression shows significant predictors of adherence to treatment were being female (AOR=2.347 95% CI 1.132-4.866), ages 60-64 years (AOR=5.833 95% CI 1.119-30.403), and being married (AOR=7.917 95% CI 1.582-39.610) (Table 4).

Table 3: Knowledge of Causes, symptoms and complications of T2DM

Question	Choice	Frequency	Percent (%)
	Lifestyle changes such as reduced physical activity and changes in dietary habits	49	37.6
	Eating Potatoes	11	8.8
What are the major causes of diabetes?	Sin against God	1	0.8
	HIV and TB	4	3.2
	Vectors such as mosquitoes	2	1.6
	I don't know	58	46.4
	Tiredness, weight loss, increased thirst, frequent urination, blurred vision.	24	19.2
What are the	Loss of hair, change in nail colour	1	0.8
symptoms of diabetes	Frequent coughing and sneezing	1	0.8
	I don't know	99	79.2
	Tiredness, weight loss, increased thirst, frequent urination, blurred vision.	15	12
Diabetes if not	Loss of hair, change in nail colour	7	5.6
treated, it may cause	Frequent coughing and sneezing	2	1.6
	I don't know	101	80.8

Table 4: Multiple Logistic Regressions of selected socio-demographic variables as predictors of adherence to treatment

Variables	Wald	df	AOR	Sig.	95% CI	
Sex					Lower	Upper
Male (r)	4.29	1	0.609	0.022		
Female	5.258	1	2.347	0.022	1.132	4.866
Age						
35-39 (r)	1.508	1	0.429	0.22		
40-44	5.006	1	0.233	0.999		
45-49	1.578	1	0.132	0.999		
50-54	1.256	1	2.333	0.262	0.53	10.267
55-59	2.214	1	3.167	0.137	0.694	14.457
60-64	4.384	1	5.833	0.036	1.119	30.403
Marital Status						
Single (r)	9.205	4	0.947	0.056		
Married	6.343	1	7.917	0.012	1.582	39.61
Divorced	0.523	1	0.728	0.999	0.308	1.721
Widow	0.399	1	0.66	0.469	0.182	2.397
Separated	0.027	1	0.947	0.527		
Occupation						
Trader(r)	3.747	3	0.429	0.29		
Civil Servant	0.532	1	1.728	0.466	0.397	7.524
Oil Worker	0.779	1	1.944	0.378	0.444	8.516
Others	2.82	1	3.889	0.093	0.797	18.975

Discussion

The result of the study shows that most of the respondents were females and were in age group 40-64 years. This is usually the age group were adult starts showing signs and symptoms of T2DM. This was similar to the results of previous studies.[13,15,16] Also, most of the respondents were literate as they attained secondary and tertiary institutions.

Knowledge of DM is a critical component in improving adherence to treatment and achieving glycaemic control among DM patients. Most of the respondents affirmed that DM is a chronic disease in which blood glucose is too high. Hyperglycaemia has been one of the characteristic features of identifying DM among patients. This finding was similar to that of a study among patients in Delta State in Southern Nigeria.[5] The finding was however, different from that of a study in Banjul Gambia where only 47% affirmed to know what DM is.[17] In addition, more of the respondents wrongly affirmed that DM was not hereditary. DM has been shown to be hereditary with several studies affirming family history as a risk factor for onset of DM.[18-20] This gap in knowledge among the respondents should be corrected because the poor knowledge might not make them encourage their family members to adopt preventive measures against contracting DM; thus probably leading to the increasing prevalence of the disease. Furthermore, the respondents exhibited poor knowledge by affirming that DM could be cured. This was different from a previous study where only 13% of the respondents affirmed DM could be cured.[21] DM currently has no known cure, although several studies have reported research activities geared towards finding a cure for DM,[22-25] however, no cure has been found for the disease. This lack of cure has led to both psychological and emotional stress among DM patients because of the continuous daily intake of oral hypoglycaemic medications.[13] This has led to use of alternative medications such as herbs which use have been reported among DM patients in Nigeria.[5] In addition, more of the respondents do not know the causes of DM which some attributed to eating potatoes, sin against God and HIV and TB. However, some correctly attributed the causes of DM to lifestyle changes such as reduced physical activity and changes in dietary habits. The finding of the study was similar to that of the study in Gambia.[17] The finding was also similar to the study in Nigeria where more than half of the respondents of that study do not know the causes of DM.[21] The finding of the study was however, different from that of a previous study in Delta State where some of the respondents attributed the causes of DM to be afflictions from the evil ones.[5]

Furthermore, majority of the respondents do not know the signs and symptoms of DM while few affirmed the signs and symptoms of DM to be tiredness, weight loss, increased thirst, frequent urination, blurred vision. Due to the absence of screening activities of DM in most communities, ability of members of communities to identify DM symptoms remains one of the best ways to seek prompt diagnosis and treatment to prevent complications. However, where community members have inadequate knowledge of signs and symptoms of DM, then most may not present until they develop microvascular complications which hinders the goal of adequate management of DM. The finding of the study was different from the study in Abia State Eastern Nigeria where 80.2% demonstrated knowledge of signs and symptoms of DM.[26] Lack of knowledge of the consequences of poorly treated DM could be costly as it could result in complications among patients. Majority of the respondents affirmed not to know the consequences of poorly managed DM. This poor knowledge could be costly for these patients as some might not take very seriously the treatment regimen prescribed at the hospital. This could result in increased morbidity and mortality due to DM.

Strict adherence to DM treatment regimen remains the hallmark of preventing complications. The finding shows more than half of the respondents partially adhered to treatment. This partial adherence could be attributed to the poor knowledge exhibited by the respondents on the components of DM. The finding of the study was different from that of a previous study where only 27.5% of the respondents were adjudged as non-adherent to antidiabetic medications.[27] The adherence level from the study was lower than that of a previous study in Delta State where 58.9% and 67.4% demonstrated total adherence to medication and dietary treatment respectively.[13]

The significant predictors of adherence to treatment were being females, elderly and married. The finding of the study was similar to a previous study in Palestine and Ethiopia where being female gender and elderly were significant predictors of adherence to antidiabetic therapy.[28-29]

Conclusion

The study showed poor knowledge of DM among the respondents as majority do not know that DM is hereditary, causes of DM, symptoms of DM. In addition, majority erroneously affirmed that DM could be cured. Furthermore, less than half partially adhered to treatment. Therefore, strategies for improving knowledge of DM and adherence to treatment regimen should be prioritised by management of the health care system. These strategies could include continuous health education on the components of DM on clinic days and scheduled follow-up and monitoring of patients to improve their level of adherence to treatment regimen.

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