ORIGINAL ARTICLE

Prevalence, Knowledge, and factors affecting the care of Diabetes mellitus among adults in Egor L.G.A, Edo State, Nigeria

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ABSTRACT

Background: Diabetes Mellitus (DM) is a disorder of carbohydrate, fat and protein metabolism characterized by high blood glucose levels, which could be a result of relative lack of, or insensitivity to insulin or both. **Objective:** To assess the prevalence, knowledge, risk factors and factors affecting the care of Diabetes mellitus among adults in Egor Local Government Area (LGA), Edo State. **Methodology:** This descriptive cross-sectional study was carried out among 400 adults using a multi-stage sampling technique. Pre-tested interviewer-administered questionnaires were tools for data collection. Data were analyzed with IBM SPSS version 20.0 software. Bivariate analysis was done using the Chi-squared test. The level of significance was set at p-value<0.05 **Results:** The mean age of the respondents was 43(±14.5). Knowledge of DM was poor in 152 (53.9%),73 (25.9%) respondents had fair knowledge while 57 (20.2%) respondents had good knowledge of Diabetes Mellitus (DM). Consumption of diet high in carbohydrate 272 (68.0%) and low level of physical activity 239 (58.0%) were identified as the major risk factors in this study. The prevalence of Diabetes was 4.0%. The high cost of treatment 35 (46.7%) and poor adherence to medication 7 (9.3%) were the major factors affecting the care of DM. **Conclusion:** The knowledge of Diabetes among the respondents was poor and the prevalence of Diabetes among respondents was 4.0%. Community-based health education on diabetes mellitus is required to help improve knowledge of Diabetes.

Keywords: Diabetes, Prevalence, Knowledge, Risk Factors, Care

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Introduction

Diabetes Mellitus (DM) is one of the leading causes of death in the world.[1] The disease is gaining ground as it threatens the meager health care resources which may overwhelm the health care system of countries soon.[2] There is a rising prevalence of the disease in Sub-Saharan Africa (SSA) which previously was dominated by infectious disease and poverty.

This is probably due to rapid urbanization, industrialization, socio economic development and changing lifestyle.[3]

The prevalence of DM in Africa is 4.2% with 15.9 million people living with the disease and 312,000 deaths due to Diabetes.[4] In sub-Saharan Africa, it is estimated that the number of people with DM will increase from 19.8 million in 2013 to 41.4 million in 2035.[5] In Nigeria, 1.7 million people are diagnosed to have DM and it is projected to be 4.8 million in 2030.[6] However, globally, 212 million cases are undiagnosed.[7] Nigeria has a prevalence of 4.0% with about 3 million people living with the disease compared to a previous prevalence of about 2.2% a decade ago.[4]

Knowledge of DM is the first bold step in the fight against the disease. Knowledge empowerment and education on good health seeking behaviour has been found to help people assess their disease risks, and motivates them in the fight against it by seeking proper treatment and care.[8]It is perceived that there is poor knowledge and negative attitude towards

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DM and it is one of the factors interfering with treatment adherence and metabolic control.[9]

Evidence exist that identified risk factors for type 2 diabetes mellitus. The modifiable risk factors include abdominal obesity, excessive alcohol ingestion, poor dietary habits and physical inactivity. The non-modifiable risk factors include ageing and genetic predisposition.[10] Modifiable risk factors for diabetes mellitus in Nigeria has been on the increase majorly due to rapid urbanization and increasing changes in lifestyle.[5]

Diabetes mellitus indeed has changed the landscape of health care in developing countries over the past 3 decades and has remained one of the costliest diseases to manage largely because of the associated complications and the comorbidities.[10]

Primary Health Care (PHC) centers in Nigeria are generally not able to manage or follow-up patients with DM and its related comorbidities/complications due to limited resources, such as diagnostic and monitoring equipment. Most of these PHC centers only have urine testing strips for glucose and very few have blood glucose meters.[10] Health care professionals, such as dietitians, nutritionists, diabetes educators, and chiropodists, are virtually absent at this lower tier of care.[10]

Thus, patient's adherence with medications is only 60.2%, self-blood glucose monitoring is only accomplished in 25.4%, and last glucose readings are only known by 58.8%.[10]

The status of glycaemic control and other targets such as blood lipids, glycated haemoglobin (HbA1c), blood pressure levels, and health education on diabetes care are below expectations.[11]

Health care services and accessibility are poor in Nigeria and this predisposes people living with DM to high economic burden and catastrophic expenditure.[12]

Knowledge of Diabetes, the prevalence and care of the disease among adults in Egor LGA, Edo State will be highlighted in this study.

The results of this study may assist health professionals in planning health education programs for Diabetics.

The findings from this study will contribute to the body of the knowledge on DM and will guide stakeholders on improved patient care and management.

Methodology

This study was carried out in Egor LGA of Edo State.[13]

A community-based descriptive cross-sectional study was carried out among adults (18 years and above). The study was carried out over six months (January to June 2017).

The minimum sample size (n) was calculated using the Cochrane formula[14] to arrive at a sample size of 381. However, 400 respondents participated in the study to cover for possible attrition.

A multi-stage technique comprising of four stages was used to select respondents for this study.

Stage one: selection of LGA: Egor Local Government Area was selected using simple random sampling technique.

Stage two: selection of wards. Out of the ten (10) wards in Egor LGA, Ugbowo ward was selected using simple random sampling technique.

Stage three: Adolor Community was selected from the 8 communities in Egor LGA using simple random sampling technique.

Stage four: selection of respondents: Adolor community was taken as a cluster and all adults that met the inclusion criteria were recruited into the study.

Quantitative data collection was obtained using interviewer administered questionnaire adapted from the University of Michigan Diabetes Research and Training Centre Knowledge test questionnaire.

The questionnaire was screened for completeness, collated, coded and analyzed using IBM SPSS version 20.0 and quantitative variables were expressed as frequencies, percentages, means and standard deviation. Univariate analysis was done to assess the distribution of variables. Bivariate analysis was used to determine the association between socio-demographic variables (age group, religion, sex, level of education) and factors associated with knowledge and care of Diabetes mellitus using Chi-square test and Fischer's exact test as appropriate.

The results obtained were presented in the form of prose and tables. A p-value of <0.05 was considered statically significant.

The International Labour Organisation (ILO) classification was modified and used to code for the occupation of the respondents under these skill levels.

Skill level 1: Simple and routine physical or manual tasks e.g. farmers, bricklayers, gardener, cleaner, students, retirees, housewives and the unemployed.
Skill level 2: Involves performances of tasks like driving and operating machines.
Skill level 3: Complex technical and practical tasks e.g. carpenters, shop managers, computer technicians.

Skill level 4: Complex problem solving, decision making and creativity task e.g. doctors, nurses, teachers, engineers, and musicians.[16]
Prevalence of Diabetes mellitus: Fasting blood glucose was used to assess the prevalence of DM among the respondents measured using Accu-Chek Active® glucometer after an overnight fast.
Knowledge score: A total of 8 questions were used to assess knowledge. A score of 1 was given for correctly answered question and 0 for wrong answer. Scores were converted to percentages and graded as follows:
Good: Scores greater than or equal to 70.0 %, Fair: Scores within 50.0-69.9 %, Poor: Scores less than or equal to 49.9 %.

Risk factors: A set of 6 questions was used to assess risk factors of DM and answers were provided based on respondents' perceived notion. A score of 1 was given for correctly answered questions and 0 for wrong answers. Scores were converted to percentages and graded as follows:
High risk: Scores greater than equal to 50.0%, Low risk: Scores less than or equal to 49.9 %
The respondents were considered to be diabetic if their fasting blood sugar was ≥ 7.0 mmol/L (126mg/dl).[17]

Ethical clearance was obtained from the Research Ethics Committee (REC) of the College of Medical sciences, University of Benin. Permission was obtained from the LGA secretariat and the community leader before the commencement of the survey. Written informed consent was obtained from all respondents.

Results

A total of 400 respondents participated in the study. One-third 126 (31.5%) of the respondents were 50 years and above, while 73(18.3%) respondents were aged 20 – 29 years. The mean age of the respondents was 43.5±14.5 years. There were 206 (51.5%) females, 346(86.3%) of the respondents were Christians, while 33 (8.3%) and 21 (5.3%) were adherents of Islam and African Traditional Religion respectively. One hundred and sixty-nine (42.3%) had tertiary level of education and 178 (44.5%) had a monthly income of 21000 – 50000 Naira. About half 206 (51.4%) of the respondents had skill level 2.
Table 1 describes respondents' knowledge of DM.

About half 152 (53.9%) of the respondents were found to have poor knowledge, 73 (25.9%) had fair knowledge while 57 (20.2%) had good knowledge of DM. Table 2 shows the socio-demographic characteristics of respondents according to their knowledge of DM.
More than 232 (58.0%) did not exercise regularly while 272 (68.0%) consumed a diet high in carbohydrates and fat; 39 (9.8%) of the respondents were obese.
Thirty-nine (9.8%) respondents smoked while 36 (9.0%) drank alcohol. Eighty-nine (22.3%) had a family history of DM. Low risk of developing DM was found in 276 (69.0%) respondents, while 124 (31.0%) have high risk of developing diabetes mellitus (Table 3).
Self-reported diagnosis of DM was found in 75 (18.8%) respondents, 33(44.0%) respondents reported that they had type 2 DM, 32 (42.7%) did not know the type of DM they had while 10 (13.3%) of the respondents had type 1 DM.
Out of the 75 (18.8%) respondents that were previously diagnosed with DM, 47 (62.7%) were given drugs, and 51 (68.0%) were told to change their diet. More than 41 (54.7%) respondents with DM were managed by General Medical Practitioners.
Health care seeking behavior of respondents were as highlighted in Table 4,
The prevalence of DM in this study was 16 (4.0 %), while 384 (96.0%) had normal blood sugar levels.

Table 1: Distribution of respondents by knowledge of diabetes mellitus

Variables*	Frequency (n)	Percent
Aware of DM (n=400)		
Yes	282	70.5
No	118	29.5
Definition of Diabetes mellitus		
Increased blood sugar level above normal	252	63.0
Disorder of carbohydrate fat and protein metabolism	205	51.2
Disorder of carbohydrate metabolism	167	41.5
Characterized by the presence of sugar in the urine	164	41.0
Characterized by a reduction in the blood level	10	2.5
Types of DM		
Insulin-dependent diabetes type 1	181	45.3
Non-insulin dependent type 2	239	59.8
Pregnancy-induced Diabetes	28	7.0
Cause of DM		
Genetic	164	41.0
Environmental	192	48.0
Both	231	57.8
Cardinal features of DM		
Excessive thirst	207	51.8
Increased appetite	144	36.0
Weight loss	233	58.3
Excessive passage of urine	256	64.0
Complications of DM		
DM foot ulcer	182	45.5
Cataract	142	35.5
Vasculopathy	106	26.5
Encephalopathy	99	24,8
Peripheral neuropathy	82	20.5

***multiple responses**

Table 2: sociodemographic characteristics and knowledge of diabetes among the respondents

Variables	Knowledge (Freq %)			
	Good n=57	Fair n= 73	Poor n=152	p value
Age group				
20-29	18 (30.5)	12 (2037)	29 (49.2)	0.230
30-39	16 (19.8)	17 (21.0)	48 (59.2)	
40-49	12 (20.0)	19 (31.7)	29 (48.3)	
≥50	11 (13.4)	25 (30.5)	46 (56.1)	
Sex				
Male	23 (16.9)	34 (25.0)	79 (58.1)	0.309
Female	34 (23.3)	39 (26.7)	73 (50.0)	
Level of education				
No formal education	1 (16.7)	3 (50.0)	2 (33.3)	0.003
Primary	4 (9.1)	13 (29.5)	27 (61.4)	
Secondary	10 (11.0)	22 (24.2)	59 (64.8)	
Tertiary	42 (29.8)	35 (24.8)	64 (45.4)	
Income (N)				
<10,000	0 (0.0)	0 (0.0)	1 (100.0)	0.001
11,000-20,000	11 (24.4)	9 (20.0)	25 (55.6)	
21,000-50,000	12 (9.5)	31(24.6)	83 (65.9)	
>50,000	34 (30.9)	33 (30.0)	43 (39.1)	
Occupational status				
Skill level 1	16 (20.3)	20 (25.3)	43 (54.4)	0.001
Skill level 2	29 (20.0)	38 (26.2)	78 (53.8)	
Skill level 3	4 (18.2)	6 (27.3)	12 (54.5)	
Skill level 4	8 (22.2)	9 (25.0)	19 (52.8)	

Table 3: Distribution of respondents by knowledge of risk factors

Variable	Frequency(n=400)	Percent
Physical activity		
Yes	168	42.0
No	232	58.0
Diet high in carbohydrate and fat		
Yes		
No	272	68.0
Obesity	128	32.0
Yes		
No	39	9.8
Smoking	361	90.3
Yes		
No	39	9.8
Alcohol	361	90.3
Yes		
No	36	9.0
Family history of DM	364	91.0
Yes		
No	89	22.3
	311	77.8
Composite risk for DM		
High Risk		
	124	31.0
Low Risk		
	276	69.0

Table 4: Quality of care among Diabetics

Variable	Frequency(n=75)	Percent
Health care personnel that managed respondents with DM*		
General practitioner	41	54.7
Diabetes doctor (Endocrinologist)	38	50.7
Dietician	22	29.3
Nurse	18	24.0
All of the above	4	5.3
Frequency of respondents visit to the health facility to see the healthcare personnel		
Once a week	2	2.7
Once in a month	31	41.3
Twice in a month	26	34.7
Once in three months	9	12.0
Once in six months	7	9.3
Respondents that check their blood sugar level		
Yes	71	94.7
No	4	5.3
Place where respondents check their blood sugar level*		
Home	21	28.0
Pharmacy	54	72.0
Hospital	69	92.0

How often respondents with DM check their blood sugar level		
Every day	2	2.7
Once a week	5	6.7
Twice a week	10	13.3
Once in a month	20	26.7
Twice in a month	17	22.7
Once in three months	10	13.3
Once in six months	7	9.3
Once a year	4	5.3
Factors affecting how respondents comply with management of DM*		
Cost of treatment	35	46.7
Distance to place of treatment	40	53.3
Not adhering to medication	7	9.3

***Diabetes Mellitus**

Discussion

One-third of the respondents were aged 50 years and above, and females. This finding is in contrast with findings from a study carried out in Owerri, where the majority of the respondents were males and aged 50 years and above.[18] Diabetes is a disease of the middle-aged and elderly. Therefore, physicians should target this high-risk group for focused intervention.

Less than half of the respondents had a tertiary level of education, and the majority of the respondents were Christians. This report is similar to a study done in Plateau State where less than half of the respondents had a tertiary level of education, and majority are Christians.[19]

Less than half of the respondents were also found to live within the income level of 20,000 – 50,000 Naira monthly. This finding is similar to a study on medication adherence of type 2 diabetes mellitus in Nigeria, where less than half of the participants in the study had an income level of ₦30000–₦ 50000.[20] Education and income are major socio-economic determinants of health. Lower levels of education lead to lower-income. Therefore, low income and education levels can result in poor outcomes of DM due to poor access to healthcare services and ignorance of the symptoms and signs as well as complications.

The majority of the respondents had heard about DM, and the main source of information was from the hospital. However, knowledge of DM was poor. This finding is similar to studies conducted in Benin City, and in Osun States, where they also had poor

knowledge of DM.[21-22] Knowledge of DM may affect whether or not an individual would adopt a behavioral change towards the prevention of risk factors for DM and the adoption of a healthier lifestyle. It may also be an indication of if one will go for DM screening to facilitate early diagnosis.

Most of the respondents had poor aware of the meaning, types and cardinal features of the disease. This finding is in consistent with a study conducted in a Tertiary Hospital in the Niger Delta region of Nigeria, which showed that the respondents had poor knowledge of Diabetes though they were aware of DM.[23] Despite the high level of awareness, gaps in the knowledge were still identified as only a few of those that knew, were aware of the meaning, types, cardinal features and complications of DM. This gap can be bridged by a collaborative effort by both the health care system and the Community through continuous educational intervention programs targeted at both health caregivers and the general population.

A higher proportion of respondents that had good knowledge were in the highest income level in this study and had a tertiary level of education compared with those in other levels. This observation is in tandem with a study carried out in Onitsha, Anambra State, Nigeria.[24] Having a high income implies having access to goods and services of greater monetary value with possible concomitant health benefits. Education again seemed to play an important role in this study, as knowledge of DM was observed to increase with higher educational levels.

Physical inactivity and consumption of diets high in carbohydrates are risk factors reported by respondents in this study. This observation supports various studies done in Uyo metropolis and Onitsha, which reported physical inactivity, eating of high carbohydrate diet and family history as the major factors predisposing individuals to DM.[24-25] These factors are associated with obesity which is an important factor in the aetiology of Diabetes. Physical activity and weight control are critical factors in diabetes prevention.

The prevalence of DM reported in this study was lower than the reported ranges in Nigeria. It was noted that the prevalence of DM in Nigeria ranged from 6.5 – 11% in urban areas.[26-27]Another study in a semi-urban town reported 5.0%.[28]

The higher prevalence in urban areas could be a result of lifestyle modifications in favour of sedentary lifestyle, western diet, more sophisticated luxury and occupation, amongst other factors. [25,27]

Few of the respondents in this study had been previously diagnosed with DM. A higher proportion of those already diagnosed was reported to have been managed by general practitioners. This finding is in contrast with a study done in Abia State.[29] This study was conducted in an urban setting with the availability of specialist doctors at the disposal of DM patients. This is a missed opportunity for people with DM not to utilize their professional services, which is perceived to be more in-depth as compared to services from general practitioners and other health care providers.

Over half of the respondents that were diagnosed with DM reported not adhering to medication and cost of treatment was a major factor affecting their management. This is in line with studies carried out in two tertiary hospitals (Uyo and Calabar) in South-South Nigeria.[25-26] The cost of managing DM and its comorbidities is a huge burden especially in a developing country like Nigeria where the main source of health care financing is out-of-pocket payment. This challenge, coupled with treating the disease throughout life, makes it even more difficult and presents a barrier to obtaining all the prescribed drugs in the quantities required. Therefore, health practitioners could help by regularly counselling the patients and by increasing the prescription of generic medications that are cost-effective.

A higher proportion of respondents that were diagnosed with DM were found to check their blood glucose level. This is in line with findings in a study carried out in two government hospitals in Owerri.[18] Effective regular diabetes education and incorporation of the patient in the management, regular monitoring of blood glucose, maintenance of healthy body weight and diet, comprehensive regular screening for diabetic complications should be an ongoing process to reduce the prevalence and menace of the disease.

In conclusion, the knowledge of Diabetes among the respondents was poor. The prevalence of Diabetes among respondents was 4.0%. The risk factors for Diabetes identified were physical inactivity, high carbohydrate consumption. The cost of treatment and failure to adhere to medications were the major

factors affecting the care of Diabetes mellitus among the respondents.

Stakeholders need to design specific public health actions such as community-based diabetes education programs in town hall meetings to educate the people about DM, highlight the need for early diagnosis and the adoption of healthy lifestyles that may prevent or delay the onset of the disease. Health education on reduction of out of pocket payments for drugs through access to community based health insurance will be beneficial to respondents. Non-Governmental Organizations (NGOs) should help subsidize the cost of anti-diabetic drugs to improve access and compliance with management.

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