Diabetes Knowledge, Attitude, and Practices Toward Self-Care among Nigerian Undergraduates: A Descriptive Cross-Sectional Study

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Abstract

Background   Diabetes mellitus is a noncommunicable chronic disease that is becoming prevalent among the youthful population.

Aim   This study assessed diabetic awareness, knowledge, attitude, and practices among undergraduates of a Nigerian university.

Methods   Descriptive cross-sectional study was conducted among 310 consenting undergraduates that completed a self-administered questionnaire on diabetes and diabetic self-care. Data collected were analyzed using descriptive and inferential statistics.

Results   The undergraduate age ranged from 16 to 30 years with the majority less than 20 years (55.5%), females 53.8%, Yoruba (87.4%), and second-year students (34.2%). Although a majority (85%) was aware of diabetes mellitus, 53% had poor knowledge, 70% had a negative attitude, and 60% had poor practices toward diabetes mellitus and diabetic self-care. Significant predictor of poor knowledge was being female (adjusted odds ratio 4.56; 95% confidence interval 2.79–7.45; $p = 0.0001$).

Conclusion   Despite high diabetes awareness, the knowledge, attitude, and practices were poor among undergraduates. There should be continuous education program on diabetes and diabetic self-care among the students.

Keywords
► diabetes awareness
► knowledge
► attitude
► practices
► diabetic self-care

ملخص المقال باللغة العربية

معرفة ووعي وسلوكيات الرعاية الذاتية لمرض السكري بين الطلاب الجامعيين بنيجيريا-دراسة وصفية مستعرضة

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خلفية:مرض السكري هو مرض مزمن غير معدٍ يزداد انتشارا بين الشباب.

الهدف: هدفت هذه الدراسة إلى تقييم الوعي والمعرفة والمواقف والسلوكيات المتعلقة بمرض السكري بين طلاب جامعة نيجيرية.

الطرق: أجريت دراسة وصفية مستعرضة على 310 طالباً جامعياً وافقوا على المشاركة، وأكملوا استبياناً ذاتياً عن السكري والرعاية الذاتية لمرض السكري. تم تحليل البيانات المجمعة باستخدام الإحصاءات الوصفية والاستنتاجية.

النتائج :تراوحت أعمار الطلاب الجامعيين بين 16 إلى 30 عاماً، حيث كان معظمهم أقل من 20 عاماً (55.5 %)، وإناث (53.8 %)، من عرق اليوروبا (87.4 %)، وطلاب في السنة الثانية (34.2%). على الرغم من أن الغالبية (85%) كانوا على دراية بمرض السكري، إلا أن 53% كانت معرفتهم ضعيفة، و70% كانت مواقفهم سلبية، و60% كانت ممارساتهم تجاه مرض السكري والرعاية الذاتية ضعيفة. كان المتنبئ المهم للمعرفة الضعيفة هو كونهم إناث (AOR 4.56؛ 95%CI 2.79-7.45؛ p=0.0001).

الاستنتاج: على الرغم من الوعي العالي بمرض السكري، كانت المعرفة والمواقف والممارسات ضعيفة بين الطلاب الجامعيين. يجب أن تكون هناك برامج تعليمية مستمرة حول السكري والرعاية الذاتية للسكري بين الطلاب.

الكلمات المفتاحية: الوعي بمرض السكري، المعرفة، المواقف، الممارسات، الرعاية الذاتية لمرض السكري.

Introduction

Diabetes mellitus (DM) is a serious noncommunicable chronic metabolic disease with high morbidity and mortality especially in middle- and low-income countries.[1,2] The global prevalence is increasing exponentially from 135 million in 1995, 151 million in 2000, 347 million in 2008, 387 million in 2014, to 463 million in 2019.[1–3] This magnitude will be 578 million in 2030 and expected to reach 700 million in 2045 if the present strategy to curtail the increase does not work.[3] Type 2 DM commonly occur after 50 years of age affecting both sexes equally; however, it is becoming prevalent among the youthful population with slight male preponderance.[3,4]

DM is also a major cause of death especially in the developing countries and continues to endanger global health with increasing burden of morbidity and mortality among young people due to transition from traditional to western lifestyles.[5–7] Aging, unchecked population growth, unhealthy eating habits, adoption of western lifestyle, obesity, poor health, and economic indices of these countries are identified factors responsible for this continuous increase in prevalence of DM worldwide.[8,9] Symptoms of diabetes include frequent urination, excessive thirst, and weight loss, while microvascular and macrovascular diseases are its long-term complications.[10–12]

The magnitude of DM could be related largely to dietary change from traditional diet with high level of fruits, vegetables, whole grains, and other beneficial foods to westernized diet that lacked these foods.[13–17] Studies in several countries among the youthful population, Nigeria inclusive, have reported the importance of appropriate knowledge, attitude, and preventive practices toward DM as an important means of delaying or stopping the development of this noncommunicable disease worldwide.[18–20] This study assessed DM knowledge, attitude, and practices among undergraduates of a Nigerian university.

Methods

Study Site and Study Design

This study was conducted at the Obafemi Awolowo University, Ile-Ife, Nigeria. The institution has 13 faculties with 82 departments. It currently has a population of over 35,000 students and approximately 5,000 staff.

The study design was a descriptive cross-sectional survey with undergraduate students as the study population.

Sample Size

The sample size was determined using an appropriate statistical formula for estimating the minimum sample size in descriptive health studies $(n = Z^2\ pq/d^2)$,[21] where n is the sample size, Z is the standard normal deviate corresponding to confidence level at $95\% = 1.96$, d is the degree of accuracy desired $= 0.05$, $p = 75.9\%$ have level of awareness of DM among undergraduate students of Osun State University, Osogbo, Nigeria,[22] while $q = 1-p = 1-0.759 = 0.241$;

$n = 1.96^2 \times 0.759 \times 0.241/(0.05^2) = 281$.

A sample size of 310 was used after 10% nonresponders were taken into consideration.

Sampling Technique

A multistage sampling technique was employed to select the study population. Stage 1 involved selecting five halls of residence out of nine halls of residence in the institution using simple random technique (balloting). Stage 2 involved

selecting four blocks in each hall of residence by simple random technique (balloting). Stage 3 involved approaching undergraduate students in the selected blocks to participate in the study till the sample size was reached.

Data Collection
Data were collected with a pretested, self-administered questionnaire that captured information on sociodemographic variables, awareness, knowledge, attitudes, and screening practices toward DM and diabetic self-care.

Data Analysis
Data were analyzed with SPSS version 20, summarized with frequencies and proportions for categorical variables, and mean and standard variation for continuous variables. The knowledge, attitude, and practices were scored and computed with "0" assigned for incorrect response and "+1" for correct response. The scores were then categorized as good or poor knowledge, positive or negative attitude, and good or poor practice using their mean score as the cutoff point. Bivariate chi-square test and multivariate logistic analyses were performed on respondents' sociodemographic characteristics, other variables, and knowledge of DM and diabetic care. A p-value of < 0.05 was accepted as significant.

Ethical Consideration
The Ethics and Research Committee of the Institute of Public Health, Obafemi Awolowo University, Ile-Ife, Nigeria, approved the study. Written consent was taken from each participant after ensuring their privacy and confidentiality. Data collected were kept in a passworded computer.

Results

A total of 310 undergraduate students completed the study. Their mean age was 20.3 (3.2) years with their ages ranging from 18 to 30 years and majority less than 21 years (55.5%). Most respondents were females (53.9%), Yoruba (87.4%), and were in the second year in the university (34.2%) (►Table 1). None of the participants had DM, and only 39 had family history. The students were from the faculties of Art (42), Social Sciences (38), Engineering (44), Law (36), Administration (37), Science (41), Environmental Design and Management (33), and College of Health Sciences (including Medicine, Physiotherapy, Nursing) (39). Of the students from College of Health Sciences, only 11 were studying Medicine, who were all preclinical students.

►Fig. 1 shows the knowledge, attitude, and practice toward DM and diabetic self-care. About 61% had poor knowledge, 45.6% had negative attitude, and 47.9% had poor practice.

►Table 2 shows the knowledge about diabetes and diabetic self-care among respondents. Seventy-seven percent have heard of DM, with social media as their major source of information (82.4%), television and radio (43.1%), while other sources of information include teachers, textbooks, newspapers, magazine, and friends (46.4%). Among those who were aware, 68.6% knew DM is high blood sugar, 83.3% knew

Table 1 Sociodemographic characteristics of undergraduate students

Variable	Frequency n (%)
Age group (y)	
18–20	172 (55.5)
21–25	130 (41.9)
26–30	8 (2.6)
Gender	
Male	143 (46.1)
Female	167 (53.9)
Class	
Year 1	43 (13.9)
Year 2	106 (34.2)
Year 3	50 (16.1)
Year 4	80 (25.8)
Year 5	26 (8.4)
Year 6	5 (1.6)
Ethnicity	
Yoruba	271 (87.4)
Igbo	18 (5.8)
Hausa	1 (0.3)
Others[a]	20 (6.5)

[a]Edo, Isan, Ebira, Nupe, and Fulani.

DM could be seen as a genetic disease, 21.8% knew that the major symptom is passage of large urine volume, while 99.6% knew that blood sugar is used to diagnose DM. Ninety-one percent of the respondents knew that regular exercise will help maintain optimal blood glucose, 98.7% knew dietary control will help maintain optimal blood glucose, while few respondents report that herbal medicine (12.6%) and prayer (27.2%) will help maintain optimal blood glucose.

►Tables 3 and 4 show the attitude and practices of respondents toward DM and diabetic self-care. Very few (3.6%) agreed that regular checkup is necessary among respondents with normal blood glucose while 15.5% agreed that tight blood glucose control delays diabetic
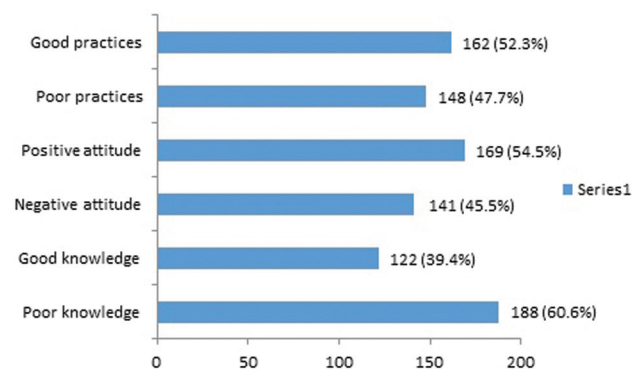
Fig. 1 Knowledge, attitude, and practice toward diabetes and diabetic self-care.

Table 2 Knowledge about diabetes and diabetic self-care among respondents

Variable	Frequency (%)
Heard of diabetes	
Yes	239 (77.1)
No	71 (22.9)
Source of information[a] (n = 239)	
Social media	197 (82.4)
Radio/Television	103 (43.1)
Medical outreaches	95 (39.7)
Health workers	94 (39.3)
Place of worship	64 (26.8)
Others[b]	111 (46.4)
Diabetes is high blood sugar (n = 239)	
Yes	164 (68.6)
No	75 (31.4)
Diabetes can occur in the family (n = 239)	
Yes	199 (83.3)
No	40 (16.7)
Major symptom is passage of large urine volume (n = 239)	
Yes	52 (21.8)
No	187 (78.2)
Blood sugar is used to diagnose diabetes (n = 239)	
Yes	238 (99.6)
No	1 (0.04)
Regular exercise will help maintain optimal blood glucose (n = 239)	
Yes	218 (91.2)
No	21 (8.8)
Prayer will help maintain optimal blood glucose (n = 239)	
Yes	65 (27.2)
No	174 (72.8)
Dietary control will help maintain optimal blood glucose (n = 239)	
Yes	236 (98.7)
No	3 (1.3)
Herbal medicine will help maintain optimal blood glucose (n = 239)	
Yes	30 (12.6)
No	209 (87.4)

[a]Multiple response.
[b]Teachers, textbook, newspaper/magazine, and friends.

Table 3 Attitude and practices of respondents toward diabetes and diabetic care

Variable	Frequency (%)
Regular checkup necessary in diabetics	
Agree	8 (3.6)
Disagree	302 (97.4)
Mild diabetes do not need insulin	
Agree	218 (70.3)
Disagree	92 (29.7)
Tight blood glucose control delays diabetic complication	
Agree	48 (15.5)
Disagree	262 (84.5)
Cigarette smoking is safe in diabetics	
Agree	299 (96.5)
Disagree	11 (3.5)
Alcohol use is safe in diabetics	
Agree	304 (98.1)
Disagree	6 (1.9)

Table 4 Practices of respondents toward diabetes and diabetic care

Variable	Frequency (%)
Accessed medical service/care in the last 1 year	
Yes	97 (31.3)
No	213 (68.7)
Medical service/care accessed (n = 97)	
Diabetic education	88 (90.7)
Blood pressure measurement	76 (78.4)
Anthropometric measurement	67 (69.1)
Screened for diabetes	46 (47.4)
Lifestyle behaviors[a] (N = 310)	
Avoid smoking	257 (82.9)
Avoid alcohol use	224 (72.3)
Regular exercise	54 (17.4)
Willingness to be screened for diabetes	
Yes	173 (55.8)
No	137 (44.2)
*Hindrances to diabetic self-care (N = 310)	
Lack of awareness	297 (95.8)
Lack of access to diabetic education	254 (81.9)
Financial constraints	246 (79.4)
Religious beliefs	235 (75.8)
Preference for herbal care	224 (72.3)
Nonavailability of self-care specialists	214 (69.0)
Fear of injections	204 (65.8)

[a]Multiple response.

complications. Most respondents believe that cigarette smoking (96.5%) and alcohol use (98.1%) are safe in diabetics. Only 31.3% have accessed medical service/care among the respondents on the previous year with 90.7% having diabetic education and 47.4% screened for DM. The lifestyle behaviors include avoiding smoking (82.9%) and alcohol (72.3%). Over

Table 5 Logistic regression analysis of sociodemographic determinants of poor knowledge of diabetes and diabetic self-care

Variable	Knowledge		Test statistics	OR; 95% CI; p-value
	Good (%)	Poor (%)	chi-square; p-value	
Age group				
18–20	82 (47.7)	90 (52.3)	13.111; 0.001	2.73; 0.54–1.39; 0.226
21–25	36 (27.7)	94 (72.3)		1.15; 0.22–5.96; 0.869
26–30 (Ref.)	2 (25.0)	6 (75.0)		1
Gender				
Male (Ref.)	82 (57.3)	61 (42.7)	38.845; 0.0001	1
Female	38 (22.8)	129 (77.2)		4.56; 2.79–7.45; 0.0001

Abbreviations: CI, confidence interval; OR, odds ratio.

half (55.8%) were willing to be screened for diabetes with lack of awareness (95.8%), access (81.9%), financial constraints (79.4%), religious issues (75.8%), preference for herbal care (72.3%), and nonavailability of specialists (69%) hindering diabetic self-care.

►**Table 5** reports the logistic regression analysis of sociodemographic determinants of poor knowledge of DM and diabetic self-care. The significant predictor was being a female (adjusted odds ratio = 4.56; 95% confidence interval 2.79–7.45; p = 0.0001).

Discussion

This study reports that the respondents show poor knowledge, negative attitude, and poor practices toward DM and diabetic self-care. These findings have been reported worldwide, which could be responsible for the increasing burden of this deadly noncommunicable disease, especially where preventive measures are not in place.[22–33] The study population, which are young undergraduates, requires continuous diabetic education to reverse this trend.

Most respondents first heard of DM and its self-care through the social media. This platform is becoming an important source of information to students and general population due to increasing access to handheld phones with Internet connection. However, social media could be unreliable as the respondents might lack the knowledge and skill to access reliable Web sites on the social media. Although this study reports television and radio as the next sources of information, some respondents heard of diabetes from the classrooms and their textbooks, highlighting the importance of structured learning for information dissemination among undergraduates. Unfortunately, a study among school teachers reported that two-fifths of the surveyed teachers had poor knowledge of DM.[14] This implies the need for continuous education of teachers about noncommunicable diseases as they are important purveyors of information to the students and youths. Also, it is important to create awareness about DM, and encourage sourcing information from reliable Web sites and resources from the Internet.

This study highlighted poor knowledge of diabetes among some respondents. For instance, some students did not know that DM is elevated blood sugar and that it runs in families with only one-fifth knowing that excessive urination is a symptom of DM. Such poor knowledge had been reported in previous studies among students and in the general population.[4,7,23,25] Some respondents reported that herbal medicine and prayer help maintain optimal blood sugar in diabetics. This further underscores the need for comprehensive education on DM among the study population.

This study shows negative attitude among the respondents as majority disagreed on regular checkup, tight blood sugar control for diabetics, and agreed that cigarette smoking and alcohol is safe in diabetics. This negative attitude could have arisen from poor knowledge reported among the respondents. Also, this study shows poor preventive practices toward DM among the respondents as less than one-third have accessed medical service/care, with diabetes education the most common and screening the least accessed. Moreover, over two-fifths were not willing to be screened for diabetes with lack of awareness, access, financial constraints, religious issues, preference for herbal care, and nonavailability of specialists identified as hindrance to diabetes self-care. This lack of willingness to undergo screening reduces the possibility of early diagnosis and treatment as prediabetes have become common in young people with genetic predisposition, obesity, and other lifestyle factors.[4,33]

None of the participants had diabetes, and only about one-eighth of them either study a health-related course or have a relation with DM. These groups (students in health-related course, patients with DM, and relations of people with DM) are expected to have some knowledge about DM. However, because of the small proportion of students having these characteristics, we expect the impact of this to be insignificant in the study outcome. Also, the few medical students among them were in their preclinical years, and hence, not yet adequately exposed to lectures on DM care and management.

This study's limitation includes its cross-sectional study design, which relies on information from respondents, hence, information bias such as recall bias may occur. However, this bias was reduced by asking questions that double-check the responses. This study provides important information that will guide policy in the study area.

Conclusion

Diabetes awareness was high among the undergraduate students while their knowledge, attitude, and practices toward diabetes and diabetes self-care were poor. There should be continuous education program on diabetes and diabetes self-care among these students with special reference to the female students.

Conflict of Interest
None declared.

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