

**Research Article****Knowledge, attitudes and practices on diabetes mellitus among out-patients with type 2 diabetes in Uyo, South-South Nigeria**

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Abstract

Diabetes knowledge, positive attitudes, good self-management practices and adherence to medication are important in diabetes care because of the chronic nature of the disease requiring long-term maintenance treatment. This study was conducted to assess present knowledge, attitude and practices of patients in the management of type 2 diabetes. Under a cross-sectional design, one hundred and three out-patients with type 2 diabetes mellitus that have been on oral anti-diabetic medication for at least a year prior to study were assessed through a validated knowledge, attitude and practice (KAP) questionnaire. The mean age of participants was 59.68 ± 11 and mean duration of diabetes was 7.22 ± 4.7 . More than half, 80.6% were males and 19.4% were females. 38.2% had good glycaemic control. Majority (79.6%) had poor diabetes knowledge. Years of formal education ($p=0.01$) and duration of illness ($p=0.02$) was significantly associated with diabetes knowledge, attitudes and self care practices. Treatment non-compliance among subjects was 34.9%. Respondents were more willing to practice dietary modification (57.3%) than active exercises (33.0%). Use of alternative medication was reported by 18.5% of participants. There is the need for health educational interventions to improve the knowledge, attitude and practices of patients with type 2 diabetes.

Keywords: Diabetes mellitus, knowledge, attitude, practice, Nigeria.**Introduction**

Diabetes mellitus is a chronic metabolic disease that has affected 387 million people by 2014. Among them, (77%) of the diabetic people reside in low and middle income countries (LMICs) and 8.3 % was adult population. Up to 2035, 592 million peoples will suffer from diabetes and among them 11 % will be adults.¹ Globally, the number of people with type 2 diabetes is rising rapidly. This rise is associated with population growth, economic development, ageing populations, increasing urbanisation, dietary changes, obesity, reduced physical activity and

changes in other lifestyle patterns.^{2,3} In Nigeria with a national prevalence of 4.83%, over 3 million people are currently living with diabetes.⁴

Diabetes is one of the major causes of morbidity and mortality and has a significant impact on the patients' quality of life, productivity and involves enormous health costs for virtually every society.⁵ One in twenty adult deaths in developing countries is diabetes-related with Africa having the highest mortality rate due to diabetes.^{4,6}

The management of diabetes mellitus (DM) largely depends on patients' ability to self-care in their daily lives, and therefore patient education is

always considered an essential element of DM management. Studies have consistently shown that improved glycemic control reduces the rate of complications and evidence suggests that patients, who are knowledgeable about DM self-care have better long term glycemic control.⁷⁻⁹ Thus it is indispensable to ensure that patients' knowledge, attitudes and practices are adequate.

Most of the risk factors of the disease like high blood pressure, tobacco use, alcohol use, physical inactivity, unhealthy diet, overweight, and obesity are accountable for NCDs (Non communicable disease) related deaths and disabilities.¹⁰ Approximately 20 min daily moderate physical activity can reduce 27 % risk of diabetes and help to reduce weight.^{10,11} Known modifiable risk factors can be reduced and controlled by patients themselves through effective education and enhanced knowledge. Previous studies suggested that the low level of health literacy is associated with adverse effect on care and health outcomes and is also a social determinant in low-and-middle-income countries.¹¹⁻¹⁵ Effective management of the disease, control of risk factors, diagnosis and prevention awareness are associated with knowledge, attitude and practice of diabetic patients.^{12-14,16} Previous study findings also reveal that persons who have good knowledge and education have good care of diabetes.¹³

Poor knowledge of self-care can cause poor long-term metabolic control which may lead to the development of diabetic complication such as retinopathy, nephropathy, neuropathy and atherosclerotic changes. Thus patients require education about the various aspects of self-care, ranging from general lifestyle advice to knowledge about the medicines prescribed (cardiovascular risk factors like smoking, obesity; regular medical and ophthalmological examinations, foot care, diet, etc)¹⁷ Due to its importance, an annual assessment of patients' skills and knowledge has been recommended by The American Diabetes Association.¹⁸

KAP related to diabetes would be helpful in the early case detection, prevention and minimizing

the illness consequences. There is sparse and growing literature on KAP about diabetes among diagnosed type 2 diabetic patients in Nigeria, such studies are significant for the design of strategies for control and prevention of disease consequences in a resource poor setting prevalent in many developing countries.

The aim of this study was therefore to assess the knowledge, attitude and practices of patients with type 2 diabetes mellitus.

Materials and Methods

This was a cross-sectional descriptive study conducted among ambulatory out-patients with type 2 diabetes mellitus.

Location of study

Under a cross-sectional design, 103 type 2 diabetic patients were selected purposively from the out-patient unit of the endocrinology department of the University of Uyo Teaching Hospital, a Federal tertiary health institution located in Akwa Ibom State in the South-South region of Nigeria. Ethical approval for this study was granted by the Health Research Ethics Committees of University of Uyo Teaching Hospital.

The inclusion criteria were patients with type 2 diabetes aged 18 years and above, who have been on anti-diabetic medications alone for at least one year prior to study entry and who willingly consented to be part of the study. The exclusion criteria precluded patients who were not physically and mentally able to conduct the interview and patients who had other medical conditions.

Data Collection

Written informed consents were obtained from the participants. Structured interviewer administered KAP questionnaires were used to obtain information on patient's socio-demographic characteristics and their knowledge, attitude and practice in relation to their illness.

The socio-demographic details were obtained of age, gender, years of formal education, marital status, employment status.

The KAP questionnaire consisted of ten questions on general knowledge about diabetes adapted from an existing KAP questionnaire.¹⁹ Five questions on attitudes and six questions on practices regarding diabetes self-care and management were drafted by the authors after extensive literature review. Each correct answer was given a score of 'one' and each wrong answer inclusive of ("don't know") was given a score of 'zero'. The maximum possible score for knowledge, attitude and practice of patients were 10, 5 and 6 respectively. The questionnaire was piloted among 10 subjects who were subsequently excluded from the study.

The questionnaire was translated into Ibibio language separately by two bilingual translators. The two versions were combined and revised and then back translated into English by another bilingual translator. The translation was refined after back translation until agreement was obtained among the four people involved in the translations.

Statistical Analysis

Descriptive statistics were used for general description of study participants. Continuous variables were summarized with means and

standard deviation (SD) values and categorical variables with frequencies. Inferential statistic such as Student t-test was used to investigate association between the primary outcome variables (knowledge, attitude, practice) and independent variables. Statistical significance was determined at p-values <0.05. The results of the study were analyzed using the Statistical Package for social sciences (SPSS 16.0).

Result

In the present study one hundred and three participants with complete questionnaire were included in the analysis. The average age of the participants was 59.68±11years and more than half of them were males (80.6%). The majority of the participants were married (73.8%) and more than half of them, about 72.6% have secondary education as the highest level of education attained. Most of the participants were Christian, 93.3% and about 29.1% were employed. The mean duration with diabetes mellitus was 7.22±4.7 years. Medication adherence among participants was 65.1%. About 38.2% of respondent had good glycaemic control.

Table 1: Socio-demographic and clinical characteristics of participants

Characteristics	Participants N(%)
Mean age	59.68±11
Age in years	
≤40 years	9(8.7)
>40years	94(91.3)
Gender	
Male	83(80.6)
Females	20(19.4)
Marital status	
Single/widowed	27(26.2)
Married	76(73.8)
Educational status	
Primary	31(30.1)
Secondary	44(42.5)
Tertiary	28(27.4)
Employment status	
Employed	30(29.1)
Unemployed	73(70.9)
Mean duration with illness	7.22±4.7
Duration of illness in years	
≤10years	89(86.4)
>10 years	14(13.6)

Knowledge regarding diabetes

About half of the respondents (42.5%) stated that diabetes is characterized by high levels of sugar in the blood and is incurable (30.6%). Regarding the signs and symptoms of diabetes, a high proportion of respondents had limited knowledge of some signs, symptoms and complications of diabetes. Frequent urination was identified by 37.2% of respondents while 27.5% of respondents had knowledge of thirst related symptoms. Only 49(47%) of the respondents could identify some complications of diabetes. The mean knowledge score was 8.7 ± 0.78 . Assessment of diabetes knowledge among our sample reveals wide knowledge gap. Overall, 21(20.4%) had good knowledge while 82(79.6%) had poor diabetes knowledge.

Table 2 Knowledge of type 2 diabetes patients about diabetes

Knowledge of diabetes	No answering yes (%)
Symptoms of diabetes	
Frequent urination	38(37.2)
Frequent hunger	13(12.3)
Frequent thirst	28(27.5)
Complications of diabetes	
Heart disease	11(10.4)
Kidney disease	9(8.6)
Eye disease	14(13.8)
Foot problem	15(14.2)
Life style factors which can prevent diabetes	
Healthy diet	22(20.9)
Regular exercise	12(11.7)
Weight control	25(23.8)

Subjects with higher level of formal education were significantly more likely to have a high score of diabetes knowledge compared to those with lower level of education ($p=0.01$). Higher duration of illness was associated with increases knowledge of diabetes ($P=0.02$). There was no significant association between knowledge scores and gender, glycaemic control status.

Attitudes and practices in diabetes

Most of the study participants (96.7%) expressed a negative attitude towards having diabetes. An assessment of attitudes of study participants showed that majority; about 57.2% expressed willingness to follow proper diet. Majority of

participants expressed more willingness to implement dietary modification (57.3%) compared to involvement in vigorous exercises (33.0%). The mean attitude score was 2.85 ± 0.47 . Overall attitude towards disease self care management was slightly higher than the average score for self care indicating an overall positive attitude towards disease self management. Among all study participants, males were as likely as the females to hold a positive attitude to diabetes self management ($p=0.06$). Participants with higher levels of formal education were significantly more likely to hold a positive attitude to diabetes care compared to those with lower level of education ($p=0.02$).

Regarding diabetes practices, regular home monitoring of blood glucose was done by only 9.7% of participants. About 42.7% of participants have sedentary life style ie their work and leisure activities do not involve active physical exercises while 13.6% of participants reported active exercises. Medication adherence over one week preceding the interview/study entry showed 65.1% of participants had taken about 80% of prescribed medications. Dietary modifications were carried out by about 53.4% of participants.

Table 3 Responses to Attitude questions

Variables	Number answering correctly
Attitude towards having diabetes	
Positive	7(6.8)
Negative	96(93.2)
Attitude towards diabetes care	
Positive	76(73.8)
Negative	27(26.2)
Willingness to follow proper diet	59(57.3)
Willingness to undertake exercises	34(33.0)
Willingness to comply with medications	101(98.1)

Forty four patients (43.0%) had very sedentary life style i.e. their work as well as leisure activities both did not involve much physical activity. Only 13.6% of patients exercised for more than half an hour daily while 32 patients (31.1%) did not exercise at all but reported to have an active life. The mean practice score was 2.25 ± 0.7 . Association of the practice score with socio-demographic characteristics show the males were as likely as the females to have a poor practice score. Years of

formal education and duration of illness were significant factors in improving self care practices ($p=0.04$ and $p=0.02$ respectively).

Table 4: Responses to practice questions

Variables	No answering yes (%)
Do you exercise regularly?	
Sedentary life style	44(42.7)
No exercise but active	45(43.7)
Active exercises	14(13.6)
Are you following controlled and planned diet?	55(53.4)
Medication use of >80% in past one week	67(65.1)
Patient self testing of blood sugar	10(9.7)
Attendances of DM clinic for follow up	98(95.2)
Use of herbal drugs in the past 30 days	19(18.5)

Discussion

This study was conducted to determine the general characteristics and diabetes related knowledge, attitude and practices of persons with Type 2 Diabetic patients attending a Diabetes Care centre. It is well known that education regarding diabetes can make significant contribution to the motivation to effect changes in the lifestyle of patients which would be helpful in maintaining good glycaemic control. Knowledge of the characteristics of the patients in terms of their knowledge, attitude and practices about diabetes will assist in planning effective health education programmes. Also, identification of vulnerable groups and characteristics of the patients will make for targeted health educational interventions. In the present study, the demographic characteristics show that the mean age of participants was 59.68 ± 11 and the mean duration of diabetes was 7.22 ± 4.7 about 30.1% of study participants had 6 years or less of formal education. This observation is consistent with previous studies which have reported similar finding.^{2,20}

Among study participants, mean values of knowledge score were found to be lower than average. There were significant knowledge gaps regarding identifying sign and symptoms of diabetes and measures to identify primary complications of diabetes, such as blood pressure monitoring, periodic eye examination, knowledge about complications and the importance of

lifestyle modifications. This is consistent with several studies from many developing countries which have reported similar findings.^{16,21-22}

American Diabetic Association has defined self management education as the process of providing the person with diabetes the knowledge and skill that is needed to perform self care, manage crises and make life style changes. Previous studies have shown a correlation between good knowledge among patients and good therapeutic outcomes.^{23,24} Other studies from both developing and developed countries, have reported that diabetic knowledge is generally poor among diabetic patients.²⁵⁻²⁷ Low formal educational background can affect diabetes self management capacity of patients. This may be due to the fact that more highly educated people had better access to many sources of written information compared to poorly educated people leading to wide knowledge gap.

Regular access to/contact with diabetic education will improve knowledge and facilitate patients' self care management. Proper education and awareness programs have previously been shown to change the attitude of the public regarding diabetes. Improving knowledge of the people can improve their attitude towards diabetes and in the long run change their practices to embrace healthier lifestyles such as eating healthy foods, and engaging in physical activity.²⁸ Such practices will minimize the risks for diabetes in the general public and delay the onset of complications in those already diabetic.

We found a low mean score for both attitude and practises of diabetes self care practice of the participants. Previous studies have confirmed the beneficial role of physical activity in improving glycaemic control.²⁹ Given the importance of physical activity to diabetes management, the low physical activity in this and similar studies should highlight the need to encourage patients to increase their physical activity. In the present study, the low level of physical activity may partly be related to the fact that majority of type 2 diabetes sufferers are elderly individuals. A high

proportion of the participants in this study (91.3%) are from the older age group including the retired workers. Old age may in part be a limiting factor for active physical activities required for good diabetes self management.

Regarding home self monitoring of blood sugar, a high proportion of study participants (62.4%) lack simple tools like glucometer for regular home monitoring of blood glucose level. The low socioeconomic background of participants may account for this observation. Low socio-economic status implies that limited financial resources are available to fund medicare especially as funding for healthcare is mainly out-of-pocket in the absence of comprehensive health insurance scheme in a resource poor setting like ours.

High rates of medication non-adherence have been widely reported in the diabetic population in many developing and industrialised countries partly because of the impact of the use of alternative medicines.³⁰⁻³³ In the present study, 34.8% of participants had taken less than 80% of prescribed medication one week prior to study entry. This is consistent with studies which have reported similar adherence prevalence.^{34,35} Also, about 18.5% of participants reported the use of alternative and complimentary medicines. Plausible explanation for this observation is the fact that in the traditional cultures existing in many developing countries, cultural health beliefs about spiritual factors in etiology of chronic illnesses like diabetes may account for poor treatment compliance and the use of herbal remedies in diabetes mellitus. Such beliefs affect help seeking behaviours and compliance with orthodox self care practices. There is the need for continued health educational interventions to dispel these beliefs and increase patients knowledge, attitude and ultimately improve patients healthcare related practices.^{36,37}

Our study has some limitations. The setting of the study is institutional based. Therefore the finding may not be generalised to other diabetic populations. Also, the cross sectional nature of the

study could not establish valid causality among the variables

In conclusion, we have shown from this study that poor knowledge, attitude and practice continues to be a challenge in patients with type two diabetes in the developing country setting. Educational strategies and counselling are needed to improve patients' self care management.

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