

# Assessment of Diabetic Patient's Knowledge and Understanding of Diabetes Mellitus in a North-Eastern Nigeria Tertiary Hospital

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**Citation:** Sabo SY, Moh'd AS, Emenike VI (2019) Assessment of Diabetic Patients' Knowledge and Understanding of Diabetes Mellitus in a North-Eastern Nigeria Tertiary Hospital. SAJ Pharma Pharmacol 6: 104

## Abstract

**Objective:** To assess the knowledge and understanding of diabetes mellitus among diabetes patients in a North-Eastern Nigerian tertiary Hospital.

**Methods:** Descriptive cross sectional study was conducted among previously diagnosed patients with diabetes attending the Diabetic clinic of the Abubakar Tafawa Balewa University Teaching Hospital Bauchi (ATBUTH). The study was carried out using a questionnaire which consists of 15 knowledge questions and 9 understanding questions.

**Results:** Majority of the respondents were between the ages of 41-60 years. Respondent with duration of diabetes illness less than 1-3 years constitute the majority 50.6%. Hypertension, one of the diabetes indices constitute the following; 42.9% normal, 1.3% pre-hypertensive, 15.6% stage 1 and 10.4% stage 2 hypertension. Over weight patients constitute the majority followed by BMI of 31.2 and 22.1% for normal and class 1obesity respectively. Neuropathy as a major diabetic complication, constitute 42.9% while retinopathy and nephropathy constitute 15.6 and 1.3% respectively. An index of these three complications is 10.4% and other complications constitute 29.9%. The knowledge and understanding of patients was found to be below average.

**Conclusion:** Respondent's knowledge and understanding of diabetes mellitus was found to be below average therefore it has become imperative for the health worker to give more information to the patients.

**Keywords:** Diabetes; Knowledge; Neuropathy; Understanding; Retinopathy; Nephropathy

## Introduction

Increases in diabetes prevalence have been recorded in virtually all regions of the world, with 415 million people worldwide now living with diabetes [1]. This is quite disturbing because an increase in diabetes prevalence will increase the number of acute and chronic diseases in the general population, with profound effects on quality of life, demand on health services and economic costs. Macrovascular and microvascular complications of diabetes are responsible for many problems [2]. The increase in prevalence and incidence of diabetes mellitus has been attributed to changes in lifestyle risk behaviours due to urbanization associated with sedentary lifestyles and unhealthy diets. The social and economic burden of patients living with diabetes on the health care system is substantial, due to high treatment expenditures, lost productivity and economic growth [3].

Despite widespread international assessment of the growth of diabetes prevalence, quantification of the international burden and variation in the incidence of diabetes-related complications is notably lacking. This stems largely from the fact that data systems and population-based studies assessing diabetes complications are concentrated in Europe, North America and other high-income countries, with little to no availability in low- and middle-income countries, where the absolute increase in diabetes prevalence is largest [4]. In Africa, the estimated prevalence of diabetes is 1% in rural areas, up to 7% in urban Sub-Sahara Africa, and between 8-13% in more developed areas such as South Africa and in population of Indian origin. The prevalence in Nigeria varies from 0.65% in rural Mangu (North) to 11% in urban Lagos (South) [5]. The American Diabetes Association (ADA) and the International Diabetes Federation (IDF) both advocate self-management to be a core component of diabetes care [6].

Evaluation of diabetes knowledge has been an important composition in the overall assessment of patients with diabetes for many years. Al-Qazaz HK, *et al.* studies have shown that increasing patient knowledge regarding disease and its complications has significant benefits with regard to patient compliance to treatment and to decreasing complications associated with the disease therefore knowledge of diabetes mellitus can assist in early detection of the disease and reduce the incidence of complications as well as produces better clinical and therapeutic outcomes [7-9].

This study was undertaken to assess the knowledge and understanding of diabetes mellitus among diabetes patients in a North-Eastern Nigerian tertiary Hospital.

## Methods

### Setting

The study was conducted among previously diagnosed patients with diabetes attending the Diabetic Clinic of Abubakar Tafawa Balewa University Teaching Hospital (ATBUTH) Bauchi City, Nigeria.

The hospital is a tertiary health care facility catering for the health care needs of the generality of people in Bauchi City, as well as referrals from the neighbouring states. An average of 124 diabetic patients attends the clinics weekly.

### Sample

Consenting consecutive patients previously diagnosed by a consultant endocrinologist using the WHO 1999 criteria were recruited as they took their turn to see the physician. Patients included in the study were those who were above 21 years old and were known diabetic with either type 1 or 2 diabetes. Patients excluded from the study include age below 21 years, refused consent, had severe speech or obvious mental impairment, were pregnant or had no diagnosis for type 1 or 2 diabetes.

Prior to the interview, the purpose of the study was clearly explained to the patients and those who could read and write self-completed the research questionnaire, while the researcher was on hand to attend to any queries arising from the respondents. On the other hand one of the researchers assisted those who could neither read nor write to complete their questionnaires. The researcher ensured that these illiterate respondents understood the questions by eliciting feedback from them.

### Study instrument

The questionnaire consisted of 15 items which represented a test of general knowledge of diabetes and 9 items which represent the level of patient's understanding of diabetes Patient's demographic data, weight, height, Blood pressure, possible complications were included.

### Data analysis

Data were coded into Microsoft Excel, and analysed using Statistical Package for the Social Sciences (SPSS) Window version 21.0. The total score was represented as a percentage.

### Ethical Approval

Ethical approval for this study was granted by the Research and Ethics Committee of Abubakar Tafawa Balewa University Teaching Hospital Bauchi.

## Results

A total of 77 patients were recruited and these completed the questionnaire. Majority of the respondents between the ages of 41-60 years, constitute 67.6% population. Female respondent made 57.10% and 89.60% participants are married, widows and widowers constitute 9.10% and 1.3% singles. Majority of the respondents had tertiary/college education 33.80%, followed by none 27.20 and secondary as well as primary 19.5%. Civil servant and self-employed constitute 33.80 and 22.10% respectively while unemployed and retired constitute 23.30 and 20.8% respectively (Table 1). Respondent with duration of diabetes illness less than 1-3 years constitute the majority 50.6%. Hypertension, one of the diabetes indices constitute the following; 42.9% normal, 1.3% pre-hypertensive, 15.6% stage 1 and 10.4% stage 2 hypertension. Over weight patients constitute the majority followed by BMI of 31.2 and 22.1% for normal and class 1 Obesity respectively. Neuropathy as a major diabetic complication, constitute 42.9% while retinopathy and nephropathy constitute 15.6 and 1.3% respectively. An index of these three complications is 10.4% and other complications constitute 29.9% (Table 2). The respondents were able to successfully answer 8 questions with percentage correct score of more than 50% while 7 questions had a percentage correct score of less than 50%. The understanding of the patients was found to be below average (Table 3 and 4).

Demographic Data	Frequency (%)
Age(Years)	
21-30	2(2.6)

Demographic Data	Frequency (%)
<b>Age(Years)</b>	
31-40	9(11.7)
41-50	21(27.3)
51-60	31(40.3)
61-70	9(11.7)
>70	5(6.4)
<b>Gender</b>	
Male	33(42.9)
Female	44(57.10)
<b>Marital Status</b>	
Married	69(89.6)
Not Married	1(1.3)
Widowed	7(9.1)
<b>Educational Status</b>	
Primary	15(19.5)
Secondary/High School	15(19.5)
Tertiary/College	26(33.8)
None	21(27.2)
<b>Occupation</b>	
Employed	26(33.8)
Self Employed	17(22.1)
Not Employed	18(23.3)
Retired	16(20.8)
<b>Duration of Diabetes Illness</b>	
<1-3year	39(50.6)
4-6years	7(9.1)
7-9years	13(16.9)
10-12years	9(11.7)
13-15years	6(7.8)
>15years	3(3.9)
N =77	

**Table 1:** Socio-demographic data of Diabetic Patients

Diabetic Indices	Frequency	%	X <sup>2</sup>
<b>Hypertension</b>			
Normal	33	42.9	53.753
Pre Hypertension	1	1.3	
Hypertension Stage 1	12	15.6	
Hypertension Stage 2	8	10.4	
<b>Body Mass Index</b>			
Below Normal	4	5.2	45.883
Normal	24	31.2	
Over Weight	26	33.8	
Obesity Class 1	17	22.1	
Obesity Class 2	4	5.2	
Obesity Class 3	2	2.6	
<b>Diabetic Complications</b>			
Neuropathy	33	42.9	92.675
Nephropathy	1	1.3	
Retinopathy	12	15.6	

Diabetic Indices	Frequency	%	X <sup>2</sup>
Neuropathy + Nephropathy + Retinopathy	8	10.4	
Other Complications	23	29.9	
N=77			

**Table 2:** Diabetic complications and Co-morbidity

Question	Yes	Frequency (%) No	I don't Know	% Correct
Eating Too Much Sugar and Other Sweet Foods is a Cause of Diabetes	47(61.0)	22(28.6)	8(10.4)	28.6
The Usual Cause of Diabetes is Lack of Effective Insulin in the Body	49(63.6)	8(10.4)	20(26.0)	63.6
Untreated Diabetes, the amount of Sugar in the Blood usually Increases	65(84.4)	2(2.6)	10(13.0)	84.4
Diabetes can be Cured	26(33.8)	38(49.4)	13(16.9)	49.4
A Fasting Blood Sugar Level of 9mmol/L is Too High	56(72.7)	13(16.9)	8(10.4)	72.7
Regular Exercise will Increase the Need for Insulin or Other Diabetic Medication	46(59.7)	26(33.8)	5(6.5)	33.8
Medication is More Important than Diet and Exercise to Control my Diabetes	34(44.2)	38(48.1)	6(7.8)	48.1
Diabetes Often Causes Poor Circulation	49(63.6)	14(18.2)	14(18.2)	63.6
Cuts and Abrasions on Diabetics Heal more Slowly	63(81.8)	7(9.1)	7(9.1)	81.8
Diabetics Should Take Extra Care when Cutting their Toenails	70(90.9)	4(5.2)	3(3.9)	90.9
The way i Prepare my Food is as Important as the Foods i Eat	66(85.7)	7(9.1)	4(5.2)	5.2
Diabetes can Damage my Kidneys	58(75.3)	10(13.0)	9(11.7)	75.3
Diabetes can Cause Loss of Feeling in my Hands, Fingers and Feet	61(79.2)	7(9.1)	9(11.7)	79.2
Shaking and Sweating are Signs of High Blood Sugar	41(53.2)	22(28.6)	14(18.2)	28.6
A Diabetic Diet consists mostly of Special Foods	50(64.9)	20(26.0)	7(9.1)	26.0
N=77				

**Table 3:** Knowledge question and percentage response of diabetic patients

Question	Poor	Frequency (%) Good	Excellent	X <sup>2</sup>
The Role of Diet in Blood Sugar Control?	16(20.8)	29(37.7)	32(37.7)	5.636
The Role of Exercise in Diabetes Care?	9(11.7)	32(41.6)	36(46.8)	16.545
The Medications you are Taking?	18(23.4)	33(42.9)	26(33.8)	4.390
How to use the Results of Blood Sugar Monitoring?	30(39.0)	31(40.3)	16(20.8)	5.481
The Prevention and Treatment of High Blood Sugar?	15(19.5)	43(55.8)	19(24.7)	17.870
The Prevention and Treatment of Low Blood Sugar?	26(33.8)	38(49.4)	13(16.9)	12.182
The Prevention of Long-Term Complications of Diabetes?	31(40.3)	34(44.4)	12(15.6)	11.091
Proper Foot Care?	14(18.20)	41(53.2)	22(28.6)	14.987

Question	Poor	Frequency (%) Good	Excellent	X <sup>2</sup>
The Benefits of Improving Blood Sugar Control?	15(19.5)	46(59.7)	16(20.8)	24.182
N=77				

**Table 4:** Understanding Questions and Percentage Response Diabetic Patients

## Discussion

Obesity is a particularly common co-morbidity seen in individuals with type 2 diabetes. In type 1 diabetes, obesity may be present in some patients and is often a result of exogenous insulin administration rather than excess caloric intake. Indeed, obesity per se is known to exacerbate the development of diabetic complications [10,11].

The belief that obesity is a sign of good living derives from local perceptions of obesity as an indicator of affluence and status. Renzaho has observed that elsewhere in sub-Saharan Africa, cultural exposure to a life of deprivation and destitution influences the way body weight is socially constructed and positioned [12,13].

A National Health and Nutrition Examination Surveys in the USA between 1976 and 2010 showed that prevalence of diabetes in men rose from 4.7% to 11.2% and from 5.7% to 8.7% in females and Body Mass Index (BMI) was found to be the major factor in the increased prevalence of diabetes [14]. The current study showed the 22.1% had class one obesity, 5.2% had class 2 obesity and 2.6 had class 3 obesity.

Diabetes is associated with a number of complications; the resulting complications are grouped under “microvascular disease” (due to damage to small blood vessels) and “macrovascular disease” (due to damage to the arteries). Microvascular complications include retinopathy, nephropathy, and neuropathy, the major macrovascular complications include accelerated cardiovascular disease resulting in myocardial infarction [15].

More than half of all individuals with diabetes eventually develop neuropathy [16], with a lifetime risk of one or more lower extremity amputations estimated in some populations to be up to 15%. There is, however, a growing appreciation that damage to the spinal cord [17] and the higher central nervous system [18] can also occur and that neuropathy is a major factor in the impaired wound healing, erectile dysfunction, and cardiovascular dysfunction seen in diabetes [3]. The result showed that about 42.9% of the patients interviewed had neuropathy as their diabetic complication.

Diabetic nephropathy represents the major cause of end stage renal failure in Western societies [19]. Importantly, kidney disease is also a major risk factor for the development of macrovascular complications such as heart attacks and strokes. Once nephropathy is established, blood pressure is often seen to rise, but paradoxically in the short term, there can be improvements in glycemic control as a result of reduced renal insulin clearance by the kidney [3]. The present study reveals that only 1.3% of the patients had nephropathy.

Diabetic retinopathy is characterized by a spectrum of lesions within the retina and is the leading cause of blindness among adults aged 20-74 years [20,21] and from the study about 15.6% of the patients had retinopathy. Management of diabetes is complex, multi-faceted and can be very challenging. One of the barriers to good diabetes control is lack of knowledge about optimal diabetes control goals and associated self-care activities [22]. Better knowledge of diabetes has been associated with greater likelihood to perform self-care activities (e.g. following a diabetes diet, blood glucose self-measurement and regular exercise) [23], fewer perceived diabetes mellitus, better medication adherence and glycemic control [24].

Diabetic patients are lacking understanding of diabetes and management of the diabetes, nature of diabetes, awareness of having diabetes, diabetic education, knowledge of diabetes, duration of illness, patients' understanding of diabetes, physical effects of treatment, severity of symptoms and disease [22].

Patient's factors such as misconceptions about the disease and medication, feeling well despite being diagnose with diabetes and questioning the necessity of continuing treatment were among factors previously reported in other studies associated with poor control of diabetes which indirectly reflecting the poor understanding related to the importance in controlling the blood sugar [25]. From the study the diabetic patients were only able to answer 8 knowledge questions with correctness above 50% which shows that good number diabetic patients lack basic knowledge about diabetes and therefore more effort should be put in place to educate them. The studies also reveal that the understanding of the patient as regards to diabetes was found to be below average.

Knowledge of efficacious Diabetes mellitus components is desirable both for the efficient and effective design of new Diabetes mellitus programs and for the expansion of existing ones [26], thus knowledge about diabetes is essential as it correlates with better outcomes leading to improved quality adjusted life years. The knowledge of the patient on diabetes is most important for the prevention of the complications associated with diabetes [27], Therefore the quality of information the patients receives will largely depend on the knowledge and experience of the medical staff in diabetes care [28].

## Conclusion

Diabetic patients are prone to experiencing diabetic complications due to poor knowledge and understanding of the disease therefore it has become imperative for the health worker to educate patients by giving health talk during regular patients' visits to diabetic and also developing a mechanism to obtain feedback responses on the knowledge and understanding gained by diabetic patients.

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