

# Assessment of Knowledge of Self Care and Patient Satisfaction with Care in Patients with Type 2 Diabetes in Warri, Delta State, Nigeria

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## Abstract

**Background:** Many persons with diabetes are not achieving treatment goals due to inadequate knowledge and poor self-management skills. Assessment of diabetes patient's knowledge and self-care skills could help design strategies to improve treatment outcomes.

**Aim:** To assess dietary and self-care knowledge of patients with type 2 diabetes and determine the level of satisfaction with care offered.

**Materials and methods:** A total of 130 patients with type 2 diabetes were consecutively recruited from the outpatient and medical wards. Knowledge of self-care and patient satisfaction were assessed using a 47 item validated pretested questionnaire and an 8 item patient satisfaction questionnaire respectively. Data analysis was done with the aid of Spss V16 and Graph pad InStat V2.05. Factor analysis was performed to determine appropriate components of patient satisfaction. Level of significance was set at  $p < 0.05$ .

**Results:** More than one quarter, 47 (36.2%) were on insulin. More than half 82 (63.1%) were non-compliant with dietary recommendations. Knowledge of self-care was low (Mean total score 33.3%) Only 48 (36.9%) could correctly recognize symptoms of hypoglycemia. Only 51 (39.2%) were capable of taking the right action in situations where they were too unwell to eat. Majority, 126 (96.9%) were unaware that foot examination was important component of diabetic care. Patient satisfaction with care was high (mean 3.81, range 1-5) although there may be a need for improvement in the therapy management dimension.

**Keywords:** Diabetes; Self-care; Mathematical model; Knowledge; Patient satisfaction; Nigeria

## Introduction

Diabetes is a chronic metabolic disease associated with micro vascular and macro vascular complications which can have devastating effect on quality of life [1-2]. There is a global increase in prevalence of diabetes across all age groups [3]. For instance, in the US, a 140% increase was observed in rates of diagnosed diabetes in persons aged 75 years and above between 1993 and 2014 [4].

The increase prevalence is especially noticeable in developing countries of the world where diabetes is now a major public health problem [5]. In Nigeria, prevalence rates have been put at 0.65%, 2.2 %, 5% and 11% depending on the location of study [6-8]. It has been estimated that about 60% of persons with diabetes are not achieving treatment goals [9]. This may be attributable to inadequate knowledge of the disease and consequently poor self-management skills [10]. Assessment of diabetes patient's knowledge and satisfaction with care is therefore very important in helping patients obtain better outcomes in management of their disease. The objective of this work was to assess dietary and self-management knowledge of type 2 patients with diabetes, determine level of satisfaction with care offered to patients with diabetes and to explore variables affecting patient satisfaction with care.

## Materials and Methods

### Setting

The study was carried out in central hospital, Warri, Delta State, Nigeria. The hospital is a 200 bed facility with 35 medical doctors, 11 registered pharmacists, 8 laboratory staff and 200 nurses. Patients were recruited from the Out-Patient Department (OPD) and medical wards of the hospital. The average daily patient turnout was 300.

### Subjects

All known patients with diabetes attending physician consultations and those admitted in the male and female medical wards of the hospital were recruited for the study.

### Inclusion/exclusion criteria

All patients diagnosed with diabetes and who were willing to participate in the study by signing a written informed consent. Patients who were critically ill at the time of the study were excluded.

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### Sample size determination

The sample size was calculated based on the average monthly turnout of patients with diabetes at the diabetes clinic which is 300 patients. Yamane’s formula was used to compute the sample size for the study [11].

$$n = N / (1 + N(e^2)) \text{ where}$$

n=The sample size, N=Total number of population, e=the level of precision or margin of error (0.05), Therefore,  $n = 300 / (1 + 300(0.05)^2)$

$$n = 171.43$$

This was rounded up to 180.

### Data collection

Demographic and clinical details were recorded on a data collection form designed for the study. This included fasting blood sugar levels, duration of diabetes, drug therapy, presence of complications. Knowledge was assessed by using a 47 item validated instrument [12]. The questionnaire assessed patient’s knowledge of symptoms and management of diabetic emergency, actions to take in the event of hyperglycaemia, hypoglycaemia and when the patient is sick, frequency of preventive eye and foot check-ups as well as use of herbal and complimentary medicines.

Patient satisfaction was assessed using an 8 item questionnaire with a 5 point Likert type response scale [13]. The questionnaire explored satisfaction with care along the following lines: care given by staff, interest shown in disease condition, explanation on use and side effects of medication, opportunity to clarify doubts and competence of staff.

### Data analysis

Usable responses were entered twice into Microsoft excel and loaded into SPSS version 19 [14]. Graph Pad instat version 2.05 was used for inferential analysis [15]. Scores were expressed as frequency and percentages. Patient satisfaction ratings were treated as interval measurements suitable for quantitative analysis. Satisfaction scores ranged from 1 to 5 with a midpoint of 3, high scores representing higher levels of patient satisfaction. Internal consistency was determined by computing Cronbach alpha. Factor analysis was performed using principal component extraction with varimax rotation, Kaiser Normalization and list-wise deletion of missing data. Factors selected for rotation must have Eigen values greater than 1.00. Items with factor loadings below 0.4 were excluded from the score summation.

### Ethical approval

Ethical approval was obtained from the research and ethics committee, central hospital, Warri. Informed consent was obtained from each participant in the study.

## Results

### Socio demographic profile

A total of 180 patients were recruited for the study but 130 patients completed the study giving a response rate of 86%. There was almost an equal number of males and females. The

predominant age group was 50 years-59 years. There were 47 (36.2%) insulin treated type 2 diabetic patients while 20 (15.4%) were on insulin and oral hypoglycaemic agents (Table 1).

**Table 1: Socio demographic characteristics of diabetic patients (N=130).**

Item	Frequency (%)
<b>Age</b>	
30-39	13(10.0)
40-49	21 (16.2)
50-59	53 (40.8)
Above 60	43 (33)
<b>Gender</b>	
Male	63 (48.5)
Female	67 (51.5)
<b>Marital Status</b>	
Single	7 (5.4)
Married	111 (85.4)
Divorced	6 (4.6)
Widow	6 (4.6)
<b>Occupation</b>	
Civil servant	20 (15.4)
Business man/woman	22 (16.9)
Trader	44 (33.8)
Teacher	3 (2.3)
Student	6 (4.6)
Unemployed	35 (27.0)
<b>Level of Education</b>	
No formal education	20 (15.3)
Primary school	46 (35.4)
Secondary school	39 (30.0)
Tertiary education	25 (19.3)
<b>Average monthly income (Naira)*</b>	
<10000	2 (1.5)
10000-50000	77 (59.2)
51000-100000	22 (16.9)
101000-150000	14 (10.8)
151000-200000	6 (4.6)
200000-250000	4 (3.2)
250000 and Above	5 (3.8)

\*. 10000 Naira = \$30 approx.

### Clinical characteristics

Nearly one quarter 32 (24.6%) had been diagnosed with diabetes for more than 5 years. More than half 70 (53.8) had retinopathy. The clinical characteristics and complications of diabetes among the study population as shown in Table 2.

**Table 2: Clinical characteristics and drug therapy.**

Item	Frequency (%)
<b>Fasting blood sugar mg/dL</b>	

60-120 normal	21(16.2)	Action patient would take if he/she had symptoms thought to be associated with high blood glucose level	3(2.3)
<120	109(83.8)		
<b>BMI kg/m<sup>2</sup></b>			
< 18.5 underweight	6(4.6)	Increase diabetic medication	30 (23.1)
13.5-24.4 Normal	49(37.7)	Continue diabetic medication	20 (15.4)
25-27 Overweight	13(10)	Seek help immediately	78 (60.0)
27.1-33 Obese	42(32.2)	Action patient would take if he/she had symptoms thought to be associated with high blood glucose level	3(2.3)
>33 severely obese	20(15.4)		
<b>Comorbidity*</b>			
Hypertension	53(40.8)	Decrease diabetic medication	9 (6.9)
Foot ulcer	12 (9.2)	Eat some sugar	43 (33.1)
Amputation	1(0.8)	Seek help immediately	59 (45.4)
Retinopathy	70(53.8)	Action patient would take if he/she felt too unwell to eat	3(2.3)
Blindness	1(0.8)		
CHF	4(3.1)	Reduce my diabetic medication	2 (1.5)
Stroke	4(3.1)	Drink sugary drinks	3 (2.3)
<b>Therapy ( Diet)</b>		Seek help immediately	46 (35.4)
Compliant	48(32.9)	Mean total	0.3133
Non-compliant	82(63.1)		
<b>Therapy ( Drug)*</b>			
Oral hypoglycaemic	103(79.2)		
Insulin	47(36.2)		
Herbal medicine	10(7.7)		
Complimentary and alternate medicine	3(2.3)		

**Table 4: Self Care practices relating to preventive care for patients with diabetes. (N=130).**

Variable	Response			
	Yes	N (%) No		
Do you carry an emergency supply of sugar or energy food with you?	23 (17.7)	107 (82.3)	0.3133	0.3133
If you ran out of your diabetic medications, would you ever use plant or herbal remedy to control your diabetes?	40 (30.8)	90 (69.2)		
How often do you have your feet examined by a nurse or doctor?	44 (37.8)	1 (0.8)	4 (3.1)	81 (72.3)
How often do you have your eyes examined by a nurse or doctor?	55 (42)	8 (4.6)	1 (0.8)	69 (33.1)

### Knowledge and self-care skills

Self-care skills of patients with diabetes was very low, mean total score 33.33%. Only 48 (36.9%) could correctly recognize symptoms of hypoglycaemia. Less than 30% of respondents knew the right action to take in the event of hypoglycaemia and hyperglycaemia. Only 51 (39.2%) were capable of taking the right action in situations where they were too unwell to eat. Skills relating to preventive self-care activities was also very low among the patients. Majority 126 (96.9%) were unaware that foot examination was important on each clinic visit. Only 6 (4.6%) agreed that yearly eye examination was important. More than three quarters 107 (82.3%) did not have the practice of carrying emergency supply sugar or other source of energy in the event of hypoglycaemia. Nearly one third 40 (30.8%) indicated a willingness to resort to herbal medications to control their sugar levels if they ran out of anti-diabetic medication. Details of self-care skills are presented in (Tables 3 and 4).

**Table 3: Knowledge and self-care skills of patients with diabetes (N=130).**

Item	Frequency (%)
Feeling tired, very thirsty and/or needing to pass large quantities of urine (Hyperglycaemia)	110 (84.6)
Feeling extremely hungry, sweating, having a headache, double vision or tremor (Hypoglycaemia)	48 (36.9)

### Patient satisfaction

The patient satisfaction questionnaire had an acceptable level of internal consistency (Cronbach alpha, 0.8446). Generally, patients indicated a high level of satisfaction with care, mean 3.81 range 1-5. Level of satisfaction was highest for competence, time spent with patient and friendliness of hospital staff. Since no item had factor loading less than 0.04, all items in the questionnaire were used for principal component analysis. Factor analysis yielded four components, Friendly explanation, Therapy management, Attitude and resource availability with mean scores 3.77, 3.71, 3.79 and 4.02 respectively, (Table 5).

**Table 5: Scores, frequency distribution and factor loading of patient satisfaction questionnaire.**

Item	Mean (SD)	%Positive	Factor Loading
1 How friendly and caring were the staff	3.86 (0.64)	80	0.731
2 Their interest in your health	3.82 (0.69)	81.5	0.669
3 How well do they explain what your medications do and possible side effects	3.70 (0.86)	74.7	0.528
4 How well do they explain how to take care of yourself	3.68 (0.73)	76.1	0.71
5 Their efforts to help you to improve your health and stay healthy	3.79 (0.52)	78.5	0.61
6 How well do they answer your questions or give you opportunity to ask questions.	3.72 (0.68)	73.8	0.572
7 Time spent with you Thoroughness and competence of the hospital staff	3.86 (0.63) 4.02 (0.069)	78.3	0.63
8 Mean total	3.81 (0.08)	0.502	83.1

### Discussion

This was a descriptive cross sectional study assessing type 2 diabetes patient knowledge and self-management skills. The predominant age group falls within observed peak age for patients with type 2 diabetes [16]. The educational and economic profile of the patients suggests that the more educated and the higher the income level, the less likely patients were to patronize public government run health facilities. There was a

low level of compliance with diabetic diet among patients. This may be due to the fact that most of the patients were in the low income group earning between 10000 and 50000 Naira (\$30-150) per month. Diabetes staple food in the area of study are quite expensive and may be beyond the reach of low income earners. Poverty has been shown to adversely affect quality of care and adherence to medication among patients with diabetes [17]. Fasting blood sugar level exceeded normal limit (120mg/dl) for majority of the patients, many of whom the patients presented with complications at the time of diagnosis. Other studies in Nigeria have also reported poor glycaemic control and presence of high levels of complications among patients with diabetes [18]. Many were also unaware of the importance of foot and eye examination for patients with established diabetes. Poor self-care practices among patients with diabetes have also been reported in similar studies in Nigeria. This may indicate a need for an integrated approach involving pharmacotherapy, patient education and building self-care capacity for patients with diabetes in the study area. Emphasis should be given to patient self-care and self-education by all professionals involved in caring for patients with diabetes.

Although patient satisfaction with care is quite high, factor analysis showed that of the four dimensions identified, therapy management had the lowest mean score. This might indicate a need for pharmacy professionals to be more interested in providing pharmaceutical care and medication therapy management services for patients with diabetes. Pharmacists in developed countries have been quite involved in diabetes care and positive outcomes have been reported. There is a need for similar level of involvement by pharmacists in developing countries. Majority of the patients had low levels of education which may have contributed to the low levels of self-management skills observed in this study. Poor knowledge of diabetes and low self-management skills were also observed in South Africa and Nigeria. This is especially worrisome in view of the fact that diabetes is a disease for which a high degree of patient involvement is needed in order to achieve successful care and adequate control and is dependent on level of patient knowledge and self- management skills.

Generalization of results from this study is limited by the fact that being a hospital based study, there may have been selection bias. A sample from the general population might have been more representative.

### Conclusion

Diabetes patient’s knowledge of self-care was very low. Even though patients were generally satisfied with care provided, there is a need for increased focus on medication management and diabetes self-management education.

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