Original Research

Patients' Satisfaction, Diabetic Control and Associated Factors at a Tertiary Health Facility in Rivers State, Nigeria

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Abstract

Background: Non-communicable diseases (NCDs) are the leading cause of death globally and diabetes mellitus (DM) is the fourth main contributor. The incidence of its complications could be reduced with high-quality care and good glycaemic control. Treatment satisfaction is an important aspect of quality of care, especially in treating chronic diseases like DM. This study sought to determine the satisfaction of diabetics with their care and to identify the relationship between patients' satisfaction and diabetic control alongside other associated factors.

Methodology: The study was a descriptive cross-sectional, hospital-based study. Respondents were admitted into the study based on inclusion criteria and selected using a systematic random sampling technique. Blood samples for fasting plasma glucose and total cholesterol were collected. Diabetic Treatment Satisfaction Questionnaire and the Patient Satisfaction Questionnaire were used to assess treatment satisfaction. The SPSS version 21.0 was used for data analysis and linear regression was used to determine the factors influencing satisfaction. The level of significance was set at 0.05.

Results: The mean total Diabetes Treatment Satisfaction score was 33.8 ± 8.2 and the mean total Short-Form Patient Satisfaction score was found to be 16.8 ± 3.6. There was a statistically significant difference between the mean satisfaction scores with treatment of diabetes mellitus and age groups ($p < 0.001$). There was also a statistically significant association between DM treatment satisfaction with the use of oral antidiabetic agents ($p = 0.043$) and the presence of complications ($P < 0.001$).

Conclusion: There was a significant correlation between patient satisfaction scores and other factors like accessibility and convenience, time spent with doctors, and so on. In conclusion, the study identified the use of oral anti-diabetic agents, and the presence of complications, among others as factors affecting patient satisfaction. This study, therefore, suggests improving the practice of patient-centered medicine by increasing patient satisfaction through addressing these factors.

Keywords: Diabetes; Patient Satisfaction; Quality of Care; Glycemic Control

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Quick Response Code:

Introduction

Non-communicable diseases (NCDs) have been established as clear threats to both human health and national development.[1] NCDs claim 63% of all deaths and are currently the world's main killer.[1] Diabetes mellitus (DM) is one of the major non-communicable diseases with dramatically increasing prevalence in both developed and developing countries.[2] DM is a serious condition at a clinical and public health level. Its increasing prevalence calls for improved care to forestall associated complications. The International Federation of Diabetes estimates that if the current trend of DM incidence continues, by 2030 over 500 million people will be diabetic.[3] In developing countries, those frequently affected by this disease are aged between 35 and 64 which makes the burden in terms of Disability-Adjusted Life years and years living with disability heavier in poorer countries.[1]

Diabetes mellitus is an emerging problem of public health significance in Sub-Saharan Africa especially Nigeria with type 2 diabetes mellitus being the most common.[4] It is becoming more prevalent owing to the increasing rates of obesity, physical inactivity, and urbanization.[4] In 2010 in Sub-Saharan Africa, 12.1 million people were estimated to be living with diabetes and was projected to increase to 23.1 million by 2030.[5] In Nigeria, the incidence and prevalence of diabetes have continued to increase despite the investment of a great deal of research and resources.[6] According to WHO, there are 1.71 million people living with diabetes in Nigeria and this is projected to reach 4.84 million by the year 2030 alongside an increase in the disease burden.[7,8] Diabetes mellitus and its complications impose substantial economic costs on patients, their families, health systems, and national economies because of the direct costs of treatment and loss of work and wages.[9]

The clinical course of Diabetes mellitus especially glycaemic control is largely influenced by patient self-management[10] and the success of self-management is dependent on the psychosocial characteristics of the individual including the satisfaction with the quality of diabetic care received.[2] Satisfied patients are more likely to develop deeper and longer-lasting relationships with their medical care providers leading to improved compliance, continuity of care, and ultimately better outcomes.[11] Patients' satisfaction can be said to be patients' values, judgment, and subsequent reaction to what they perceive in the health environment just before, during, and after the course of their clinical visit. Improving the quality of care for patients with chronic conditions like diabetes has become an important focus of the healthcare system.[12] This is because despite advances in diabetes care and diabetes care facilities, desired outcomes and patient satisfaction with the care received and outcomes experienced are not optimal.[6] The global control of glycaemia in diabetics remains an uphill task and achieving target blood glucose levels require good adherence to prescribed medication and specific health-related behaviours. These could be attained where there is good patient satisfaction as treatment satisfaction has been associated with adherence to treatment, glycaemic control, and treatment preference.[13]

There is a paucity of research in Nigeria on the relationship between patients' satisfaction and glycaemic control in diabetics. Most studies have focused on patient satisfaction with healthcare services. This study thus aimed to explore the relationship between patients' satisfaction and diabetic control, as well as to identify associated factors such as duration of diabetes, types of treatment, types of complications, and associated co-morbidities among diabetic patients in a tertiary care facility in Rivers State, to improve the outcome of diabetic care in the state and the country at large.

Materials and Methods

The study was carried out at the diabetic clinic of the University of Port Harcourt Teaching Hospital (UPTH), Port Harcourt. The UPTH is a tertiary healthcare institution and comprises various specialties. The diabetic clinic is held in the Medical Outpatient Department and is run once a week. It attends to an average of 50 Diabetic patients on follow-up a week giving a total of 200 patients a month most of which are referred from the Family Medicine clinic and Accident and Emergency departments. This was a cross-sectional descriptive hospital-based study carried out among consenting diabetics aged between 15-70

years. Newly diagnosed diabetics, diabetic patients who had not been managed for up to one month at the facility as well as those who were severely ill and could not stand the stress of the research, were however excluded from the study.

In the absence of any prevalence figure on patient satisfaction among diabetics, the prevalence of 50% satisfaction was used to determine a sample size of 400 for the study using Cochrane's formula. Respondents were selected by systematic random sampling. From the records in the diabetic clinic, an average of 50 diabetic patients on more than one-month follow-up are seen weekly giving a total of 50 x 16 (where 16 is the number of weeks the study is expected to last) =800. Therefore, the total number of patients was 800 patients. The sample interval was derived by dividing the sampling frame by the estimated sample size i.e. $\frac{800}{400}$ =2. The first sample was selected using a simple random technique in which the first two diabetic patients on follow-up present in the clinic at the commencement of the study each week handpicked numbers from 1 and 2. The person who picked number "1" was taken as the first and approximately 25 persons were seen each week.

Data collection was conducted using a pretested interviewer-administered structured questionnaire (The Diabetic Treatment Satisfaction Questionnaire and the Patient Satisfaction Questionnaire)[14] and was done by the principal researcher and trained assistants. It contains eight items scored on a six-point scale. Six items measured treatment satisfaction (dealing with satisfaction with the current treatment, the convenience of the treatment, flexibility, satisfaction with own understanding of their diabetes, how likely to recommend their present treatment, and how satisfied to continue their present treatment). These were summed to produce a total treatment satisfaction score. Questions 2 and 3 concerning the level of blood sugar were treated separately from the satisfaction items and each other. On these two items, low scores represented good perceived blood glucose control. DTSQ scores ranged from, 6= very satisfied to 0 = very dissatisfied.

The PSQ–18 yields separate scores for each of the seven different subscales. General satisfaction (items 3 and 7), technical quality (items 2,4, 6, and 14), interpersonal manner (10 and 11), communications (1 and 13) financial aspects (5 and 7), time spent with the doctor (12 and 15) as well as accessibility and convenience (8, 9, 16 and 18). Some items of PSQ-18 were worded so that agreement reflected satisfaction with medical care whereas other items were worded so that agreement reflected dissatisfaction with medical care. After item scoring, items within the same subscale were averaged together to create the seven subscale scores. Items left blank by respondents were ignored when calculating scale scores.

The independent variables measured were sex, age, marital status, occupation, level of education, and glycaemic control, while the dependent variable was the patients' satisfaction. Other data collected included the respondents' weight and height which were used to estimate their body mass index (BMI) and categorized as underweight: BMI< 18.5kg/m^2; normal weight: BMI of 18.5-24.9kg/m^2, overweight: BMI of 25-29.9kg/m^2; and obesity: BMI of >30kg/m^2. Their blood pressure was also measured and their fasting blood sugar was assessed. A fasting blood glucose level of less than or equal to 5.5mmol/L was taken as good glycaemic control. Urinalysis as well as blood cholesterol levels of each participant were also assessed. Hypercholesterolemia was diagnosed by total blood cholesterol > 240mg/dl according to the 2001 National Cholesterol Education Program (NCEP) Guidelines.[15] All samples were sent to the Chemical Pathology laboratory of UPTH for laboratory analysis.

Data analysis was carried out using Statistical Package for Social Sciences (SPSS) version 21. Quantitative variables were summarized using mean and standard deviation, while categorical variables were summarized using frequencies and percentages. The Chi-squared test was used to test the association between two categorical variables. The satisfaction scores were compared between and among the different categories of the socio-demographic characteristics using the student's t-test and analysis of variance (ANOVA) respectively. Spearman's rank correlation coefficient was used to determine the degree of

association between the pairs of PSQ satisfaction subscales. Linear regression was used to determine the factors influencing satisfaction and the level of significance was set at 0.05. Ethical approval was obtained from the UPTH Ethics Committee. Departmental approval from the Head of Internal medicine was also sought and obtained. Informed consent was sought and obtained from each study participant recruited in accordance with the ethical principles for the guidance of physicians in medical research. Confidentiality, beneficence, non-maleficence, and the right to withdraw without loss of benefits of the study participants were also ensured during the study.

Results

Four hundred subjects were involved in the study. The age range of participants was between 21 and 69 years and the largest proportion of them were aged between 60 and 69 years with a mean age of 55.3 ± 12.8 years. The majority of the study participants were also females (62.0%), were Christians (96.5%), and were married (74.75%). 45.3% of the respondents had received tertiary education, and 41.5% were skilled workers. These are shown in Table 1.

Table 1: Demographic Characteristics of Respondents

| Variable	Frequency (n=400)	Percentage
Age (year)		
20 – 29	13	3.3
30 – 39	33	8.2
40 – 49	78	19.5
50 – 59	112	28.0
60-69	164	41.0
Mean age	55.3± 12.8	
Sex		
Male	152	38.0
Female	248	62.0
Religion		
Christianity	386	96.5
Islam	12	3.0
Traditional	2	0.50
Marital status		
Single	25	6.3
Married	299	74.8
Separated/Divorced	17	4.2
Widowed	59	14.7
Education		
No formal	32	8.0
Primary	107	26.8
Junior Secondary	14	3.5
Senior Secondary	66	16.5
Tertiary	181	45.2
Occupation		
Skilled	166	41.5
Unskilled	130	32.5
Unemployed	42	10.5
Retired	62	15.5

Clinical characteristics of participants

Regarding their clinical characteristics, 41% had been diabetic for less than 5 years, 29.5% and 29.5% had been diabetic for 5 – 10 years and > 10 years respectively as shown in Figure 1.
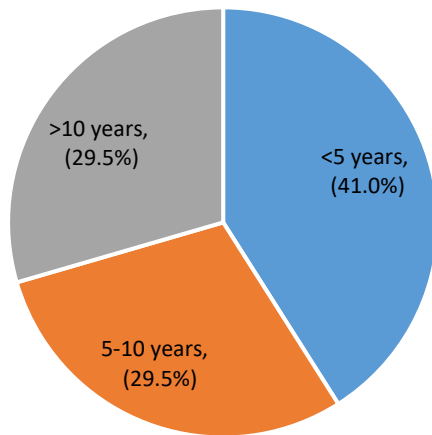
Figure 1: Duration since diagnosis of diabetes among respondents
The majority of the respondents, 81.0% had received oral hypoglycaemic agents, while 39.0% and 30% had received diet/exercise and insulin respectively for managing the disease as shown in Figure 2.
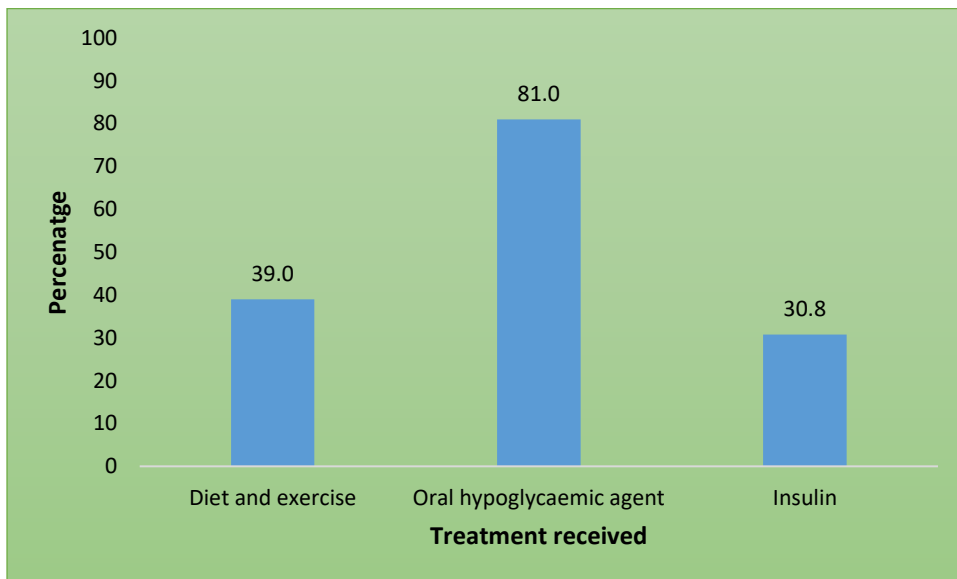
Figure 2: Proportion of type of treatment received by respondents
Among the participants, 51.5% of them experienced complications as a result of the disease. Among this number, 53.4% had retinopathies, 41.3% experienced neuropathies, 25.7% had foot ulcers, 6.8% had nephropathies and 6.8% experienced other complications. This is shown in Figure 3.
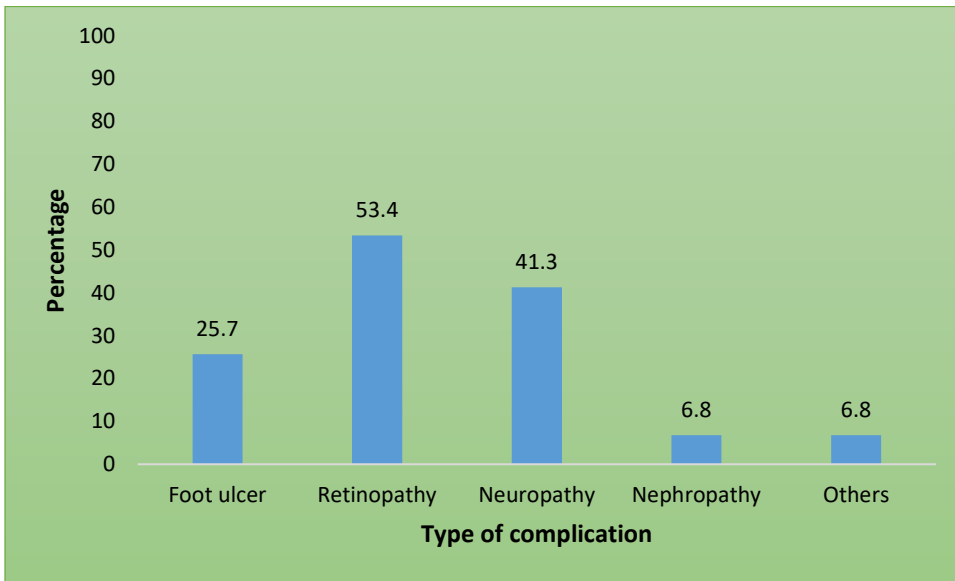
Figure 3: Types of complications of diabetic mellitus among participants

Findings on Physical Examination

Regarding the blood pressure of the participants, the majority of them 66.5% had normal blood pressure, and 32.0% were hypertensive. The mean systolic blood pressure was 133 ± 20 mmHg and the mean diastolic blood pressure was 82 ± 12 mmHg. Also, only 26.8% of the participants had normal BMI, while 35.8% and 36.5% of the study participants were overweight and obese respectively. The mean BMI was found to be 28.4 ± 5.8 kg/m^2. Additionally, 46.3% of the participants were found to have glycosuria and 20.3% of them had proteinuria. Concerning their level of glycemic control, it was found that 19.8% of them had fasting blood sugar of <5.5 mmol/L and the mean fasting blood sugar was 8.9 ± 5.5 mmol/L. (Table 2).

Table 2: Blood Pressure Measurement

Variables	Frequency (n = 400)	Percentage (%)
Blood pressure		
Normal	266	66.5
Hypotension	6	1.5
Hypertension	128	32.0
Mean SBP	133 ± 20mmHg	
Mean DBP	82 ± 12mmHg	
Body Mass Index (BMI)		
< 18.5	4	1.0
18.5 – 24.9	107	26.8
25.0 – 29.9	143	35.8
≥ 30	146	36.5
Mean BMI	28.4 ± 5.8	
Glycosuria		
Absent	215	53.75
Present	185	46.25
Proteinuria		
Absent	319	79.75

Present	81	20.25
FBS (mmol/l)		
< 5.5 (controlled)	79	19.75
≥ 5.5 (not controlled)	321	80.25
Mean FBS	8.9 ± 5.5	

Regarding the lipid profile of the study participants, it was found that the majority of them (67.5%) had total cholesterol that was ≤ 6 mmol/L and the mean total cholesterol was 5.7 ± 1.7 mmol/L. Only 20.0% of them had triglyceride of ≤ 1.7 mmol/L with a mean triglyceride of 2.5 ± 1.0 mmol/L, and up to 57.0% of them had high-density lipoprotein (HDL) levels of ≥ 1.2mmol/L with a mean HDL of 1.3 ± 0.6 mmol/L. (Table 3).

Table 3: Lipid Profile of Study Participants

Variable	Frequency (n = 400)	Percentage
TC (mmol/l)		
≤ 6	270	67.5
> 6	130	32.5
Mean TC	5.7 ± 1.7	
TG (mmol/l)		
≤ 1.7	80	20.0
> 1.7	320	80.0
Mean TG	2.5 ± 1.0	
HDL (mmol/l)		
< 1.2	172	43.0
≥ 1.2	228	57.0
Mean HDL	1.3 ± 0.6	

Patients' Satisfaction Score
As shown in Table 4, the mean total Diabetes Treatment Satisfaction Questionnaire score was 33.8 ± 8.2 after cumulating the different mean scores of the various domains of the study instrument which assessed patient satisfaction.

Table 4: Diabetes Treatment Satisfaction Questionnaire scores

Item	Mean ± SD	Median
How satisfied are you with your current treatment?	4.8 ± 1.4	5
How often have you felt that your blood sugar has been unacceptably high recently?	3.1 ± 2.0	3
How often have you felt that your blood sugar has been unacceptably low recently?	4.2 ± 1.8	5
How convenient have you been finding your treatment to be recently?	4.3 ± 1.5	5
How flexible have you been finding your treatment to be recently?	4.2 ± 1.4	4
How satisfied are you with your understanding of your diabetes?	4.2 ± 1.6	5
Would recommend this form of treatment to someone else with a kind of diabetes?	4.4 ± 1.6	5
How satisfied would you be to continue with your present form of treatment?	4.6 ± 1.5	5
Total score	33.8 ± 8.2	35

The mean total Short Form Patient Satisfaction Questionnaire (PSQ) score was found to be 16.8 ± 3.6 after cumulating the mean scores for the different domains of the PSQ. These are shown in Tables 5a and 5b.

Table 5a: Short-Form Patient Satisfaction Questionnaire Scores

Item	Score (n = 400)	
	Mean ± SD	Median
1. Doctors are good at explaining the reason for medical tests	2.0 ± 1.1	2
2. I think my doctor's office has needed to provide complete medical care	2.5 ± 1.2	2
3. The medical care I have been receiving is just about perfect	2.2 ± 0.9	2
4. Sometimes doctors make me wonder if their diagnosis is correct	2.5 ± 1.1	2
5. I feel confident that I can get the medical care I need without being set back financially	2.8 ± 1.2	3
6. When I go for medical care, they are careful to check everything when treating and examining me	2.1 ± 0.9	2
7. I have to pay for more of my medical care than I can afford	3.2 ± 1.3	3
8. I have easy access to the medical specialists I need	2.4 ± 0.9	2
9. Where I get medical care people have to wait too long for emergency treatment	3.1 ± 1.1	3
10. Doctors act too business-like and impersonal towards me	2.4 ± 1.1	2
11. My doctors treat me in a very friendly courteous manner	2.0 ± 0.9	2
12. Those who provide my medical care sometimes hurry too much when they treat me	2.5 ± 1.0	2
13. Doctors sometimes ignore what I tell them	2.2 ± 0.9	2
14. I have some doubts about the ability of the doctors who treat me	2.2 ± 1.0	2
15. Doctors usually spend plenty of time with me	2.4 ± 1.0	2
16. I find it hard to get an appointment for medical care right away	2.4 ± 1.0	2
17. I am dissatisfied with some things about the medical care I receive	2.5 ± 1.0	2
18. I am able to get medical care whenever I need it	2.1 ± 0.9	2

Table 5b: Short-form patient satisfaction questionnaire subscales scores

Scale	Items averaged	Score (n = 400)	
		Mean ± SD	Median
General satisfaction	3 & 17	2.4 ± 0.8	2.0
Technical Quality	2, 4, 6 & 14	2.3 ± 0.6	2.3
Interpersonal Manner	10 & 11	2.2 ± 0.8	2.0
Communication	1 & 13	2.1 ± 0.8	2.0
Financial Aspect	5 & 7	3.0 ± 1.1	3.0
Time Spent with Doctor	12 & 15	2.4 ± 0.8	2.0
Accessibility and Convenience	8, 9, 11 & 18	2.4 ± 0.6	2.5
Total score		16.8 ± 3.6	16.5

4.4   Association between Socio-Demographic factors and Treatment satisfaction

There was a statistically significant difference between satisfaction with the treatment of diabetes mellitus and the age groups of the respondents ($p < 0.001$). The mean score for satisfaction with treatment of diabetes mellitus was highest in the age group 30–39 years (37.0 ± 4.6), followed by the age group 50–59 years (35.8 ± 7.7). The mean was lowest in the age group 20–29 years (23.2 ± 8.9), followed by the age group 40-49 years and 60-69 years (33.1 ± 8.3). No other socio-demographic factor was found to be associated with treatment satisfaction among the respondents (Table 6).

Table 6: Associations between socio-demographic factors and treatment satisfaction

Variable	Mean ± SD	95% CI of mean		Statistics	p-value
		Lower	Upper		
Age (Year)					
20 – 29	23.2 ± 8.9	17.9	28.5	F = 9.556	< 0.001*
30 – 39	37.0 ± 4.6	35.4	38.7		
40 – 49	33.1 ± 8.3	31.2	34.9		
50 – 59	35.8 ± 7.7	34.3	37.2		
≥ 60	33.1 ± 8.3	31.8	34.3		
Sex					
Male	33.3 ± 8.8	31.9	34.7	t = 1.031	0.303
Female	34.2 ± 7.9	33.2	35.1		
State of Origin					
Rivers	33.9 ± 8.2	33.0	34.7	t = 0.317	0.751
Non-Rivers	33.5 ± 8.5	31.2	35.8		
Religion					
Christianity	33.9 ± 8.2	33.1	34.7	t = 0.777	0.437
Others	32.1 ± 10.4	26.1	38.1		
Marital Status					
Single	31.0 ± 9.5	27.1	35.0	F = 1.104	0.347
Married	34.3 ± 8.2	33.2	35.0		
Separated/Divorced	34.2 ± 5.8	31.2	37.2		
Widowed	33.5 ± 8.4	31.3	35.7		
Education					
No formal	37.2 ± 5.9	35.1	39.3	F = 1.624	0.167
Primary	33.6 ± 8.4	31.9	35.2		
Junior Secondary	33.2 ± 7.5	28.9	37.6		
Senior Secondary	34.2 ± 7.0	32.5	35.9		
Tertiary	33.3 ± 8.9	32.0	34.6		
Occupation					
Skilled	33.6 ± 8.4	32.3	34.9	F = 0.348	0.791
Unskilled	34.0 ± 8.6	32.5	35.5		
Unemployed	34.8 ± 6.8	32.7	36.9		
Retired	33.4 ± 7.9	31.4	35.4		
SES					
Class 1	31.8 ± 8.4	28.3	35.3	F = 0.794	0.530
Class 2	33.2 ± 7.9	31.2	35.1		
Class 3	35.5 ± 7.4	32.9	38.2		
Class 4	33.8 ± 8.9	31.7	35.9		
Class 5	33.9 ± 8.3	31.7	36.2		

* Statistically significant; F = F statistic for Analysis of Variance (ANOVA); t = Student's t statistic

4.5 Treatment satisfaction and other associated factors
There were statistically significant associations between scores for treatment satisfaction with the use of an oral hypoglycaemic agent (p = 0.043) and the presence of complications (P < 0.001). Participants using an oral hypoglycaemic agent had a higher mean satisfaction score (34.2 ± 8.1) than those who were not using an oral hypoglycaemic agent (32.1 ± 8.6). Those with no complications of diabetes mellitus had a higher mean satisfaction score (35.3 ± 8.0) than those with complications of diabetes mellitus (32.4 ± 8.2). (Table 7)

Table 7: Diabetes Treatment Satisfaction and Other Associated Factors

Variable	Mean ± SD	95% CI of mean		Statistics	p-value
When diagnosed (year)		Lower	Upper		
< 5	33.6 ± 7.8	32.4	34.8	F = 0.339	0.713
5 – 10	34.3 ± 8.4	32.8	35.9		
> 10	33.6 ± 8.7	32.0	35.1		
Type of Treatment					
Diet and exercise					
Yes	34.3 ± 7.5	33.1	35.5	t = 0.925	0.356
No	33.5 ± 8.7	32.4	34.6		
Oral Anti-Diabetic Agents					
Yes	34.2 ± 8.1	33.3	35.1	t = 2.015	0.045*
No	32.1 ± 8.6	30.2	34.1		
Insulin					
Yes	32.9 ± 7.6	31.5	34.2	t = 1.535	0.126
No	34.2 ± 8.5	33.2	35.3		
Have complication(s)					
Yes	32.4 ± 8.2	31.3	33.5	t = 3.573	< 0.001*
No	35.3 ± 8.0	34.2	36.5		
SBP (mmHg)					
< 120	35.0 ± 7.7	33.5	36.6	F = 1.706	0.183
120 – 139	33.9 ± 8.9	32.4	35.3		
≥ 140	33.1 ± 7.8	31.8	34.3		
DBP (mmHg)					
< 80	33.6 ± 8.5	32.0	35.2	F = 0.680	0.507
80 – 89	34.5 ± 8.3	33.1	35.9		
≥ 90	33.4 ± 8.0	32.1	34.7		
Glycosuria					
Absent	34.5 ± 7.8	33.5	35.6	t = 1.889	0.060
Present	33.0 ± 8.6	31.7	34.2		
Proteinuria					
Absent	33.6 ± 8.2	32.7	34.6	t = 0.848	0.397
Present	34.5 ± 8.5	32.6	36.4		

* Statistically significant; F = F statistic for Analysis of Variance (ANOVA); t = Student's t statistic

After multivariate analysis, it was observed that the satisfaction with DM treatment increased by 2.35 with the use of oral hypoglycaemic agent and it decreased by 2.91 with the presence of complications of DM. (Table 8).

Table 8: Simple Linear Regression of Diabetes Treatment Satisfaction on The Associated Factors

Variable	B	SE	p-value	r^2 (%)
Age (year)	0.03	0.320	0.372	0.2
Use of oral hypoglycaemic agent	2.35	1.029	0.045*	1.0
Presence of complications of DM	-2.91	0.811	< 0.001*	3.1
Presence of glycosuria	-1.56	0.823	0.060	0.9

*Statistically significant; b = regression coefficient; SE = standard error; r^2 = coefficient of determination

4.6   Correlation between the subscales and the overall score of PSQ Satisfaction

Accessibility and Convenience correlated most with overall satisfaction (r = 0.74), followed by Interpersonal Manner (r = 0.68), Time spent with the doctor (r = 0.65), and Technical Quality (r = 0.62), while Financial Aspect correlated least with the overall satisfaction (r = 0.50), followed by General Satisfaction (r = 0.60) and Communication (r = 0.61). See Table 9.

Table 9: Spearman's Rank Correlation (ρ) between the subscales and the overall score of PSQ Satisfaction

PSQ Subscale	Spearman's Rank correlation (r)	p-value
General Satisfaction	0.60	< 0.001*
Technical Quality	0.62	< 0.001*
Interpersonal Manner	0.68	< 0.001*
Communication	0.61	< 0.001*
Financial Aspect	0.50	< 0.001*
Time Spent with Doctor	0.65	< 0.001*
Accessibility and Convenience	0.74	< 0.001*

*Statistically significant

4.7   Patients' Satisfaction and Glycaemic Control

There was no statistically significant association between fasting blood sugar and treatment satisfaction (p = 0.607). However, the mean score for satisfaction with DM treatment was higher among participants with fasting blood sugar ≤ 5.5mmol/L (34.3 ± 8.5) than those with fasting blood sugar > 5.5mmol/L (33.7 ± 8.2). (Table 10). Also, the Table shows that there was no statistically significant association between fasting blood sugar and patient satisfaction as measured with short form patient satisfaction questionnaire though the mean score for satisfaction was higher among participants with fasting blood glucose ≤ 5.5mmol/L (17.0 ± 0.3) than those with fasting blood sugar >5.5mmol/L (16 ± 3.6).

Table 10: Treatment Satisfaction and Fasting Blood Sugar

Variable	Mean ± SD	Mean diff.	95% CI of diff. Lower	Upper	Statistics	p-value
FBS (mmol/l)						
< 5.5 (controlled)	34.3 ± 8.5	0.5	-1.5	2.6	t = 0.515	0.607
≥ 5.5 (not controlled)	33.7 ± 8.2					
FBS (mmol/l)						
< 5.5 (controlled)	17.0 ± 3.3	0.2	-0.7	1.1	t = 0.509	0.611
≥ 5.5 (not controlled)	16.8 ± 3.6					

Discussion

The preponderance of diabetics in the age group 60-69 years (41.0%) in this study could be attributed to the fact that the proportion of people diagnosed with diabetes generally increases with age [16] because of worsening insulin resistance with age, increased inactivity as well as longevity of diabetics due to improved care.[4] This finding has been corroborated by various Nigerian studies[6,17,18] and international studies.[19,20] However, Gezawa et al[21] in Maiduguri found the highest prevalence among the middle age group though age greater than 35 years was an independent risk factor for diabetics in that study. This could be due to the fact that their study was a population-based study. This study demonstrated a statistically significant difference between treatment satisfaction and the different age groups (p<0.001). However, after regression, this association no longer existed (p=0.372). This is in keeping with the findings by Kuteyi et al[22]in Ile-Ife, Adeniyi et al[23] in Lagos, and Al Shahrani et al[12] in Oman, who found no significant relationship between age and patient satisfaction with diabetic care. This finding is however in contrast to several other studies[24-29] which posited that satisfaction is associated with age and increases with increasing age and that younger patients have higher expectations that may be difficult to meet. This difference may be due to the differences in study tools used in assessing patient satisfaction and population characteristics.

Regarding the treatment modality, patients who were taking tablets had higher mean treatment satisfaction scores (34.2 ± 8.1; p = 0.045), with a significant difference from those who did not. Multivariate analysis confirmed a positive correlation between use of oral anti-diabetic drugs (OAD) and treatment satisfaction (p=0.023). This implied that taking a pill was more comfortable for diabetic patients rather than injecting insulin. It could be due to the reason that patients might think insulin treatment meant that their health status had deteriorated. This was corroborated by Bener et al[2] but was in contrast to the findings by Biderman et al[30] where patients on diet alone were the most satisfied with their treatment modality. Patients taking only oral anti-diabetic drugs have also been reported to be more satisfied than those taking insulin and OAD[30].

This study also reported that satisfaction scores were lower in patients with complications (32.4 ± 8.2; p<0.001). Multivariate analysis confirmed a negative correlation between treatment satisfaction and the presence of complications. It may be suggested that those with complications were less likely to be satisfied because they felt that the presence of complications meant inadequate provision of care. In addition, it is pertinent to note that most diabetics with complications were on insulin hence the low satisfaction scores in both groups of respondents. This finding is similar to the findings of other authors.[2,30,31]

Furthermore, this study found accessibility and convenience as significant predictors of satisfaction which also correlated most with overall satisfaction on the PSQ-18 scale (r=0.74). Easy access and short waiting times have also been found to be strong determinants of patient satisfaction in different studies.[32,33] This however contrasted with the findings of Amole et al[34] where waiting time had the least impact on satisfaction probably because of the method of analysis (analytical hierarchy process) and the fact that it was a multicentre study. The interpersonal manner of the doctors was found to be a significant predictor of satisfaction in the short-form PSQ-18 satisfaction score as it was highly correlated with overall satisfaction (r=0.68). Doctors' empathy has consistently been found as an important factor in the determination of patients' satisfaction. It agreed with reports by Amole et al[34] where it was found that the empathy dimension of 16.46% had the greatest impact on service delivery and Nasir et al[35] who found that patients who evaluated the behaviour of the staff members as poor were least likely to be satisfied.

The time spent with the doctor was also found in this study to be a significant contributor to the satisfaction score as it had a high correlation with overall satisfaction (r =0.65). Time spent with the doctor appears to compensate the patient for all the inconveniences of the system and the patient feels that more time spent with the doctor meant better care. This was in keeping with some studies.[36,37] In this study, technical quality was another significant predictor of satisfaction (r =0.62). Perceptions of provider technical competence

have also been reported to influence patient satisfaction.[38,39] Communication between doctor and patient was a significant predictor of patient satisfaction because information to the patient is considered an important aspect of patients' expectation of personalized care which is in agreement with the findings of several studies[34,35-41] where communication was the most important factor associated with patient satisfaction. Ironically, the financial aspect was found in this study to correlate least with overall satisfaction scores (r=0.50). This may be because of the prevalent out-of-pocket financing of health care in our environment, hence, most clients coming to the facility are prepared to personally fund the healthcare services they receive which could be higher than what they expected to pay. This was similar to the finding by Zaiei et al[39] but was in contrast with the Nabbuye-Sekandi et al'[38] study conducted in Uganda.

In this study, there was no statistically significant association between glycaemic control as measured by fasting blood glucose and treatment satisfaction (r = 0.607). Also, there was no statistically significant association between glycaemic control as measured by fasting blood glucose and patient satisfaction as measured by the short-form satisfaction questionnaire (r = 0.611). This finding corroborates the findings of Al Shahrani et al[12] who found no association between glycaemic control and patient satisfaction. It was, however, in contrast with the reports from other studies.[2,42,43] This may be due to the difference in the criteria used to assess glycaemic control in the contrasting studies.

The present study did not also show any significant association between the duration of diabetes and treatment satisfaction (r=0.713). Patients with chronic illnesses were expected to know more about their illness and thought to require more attention.[44] However, this study did not demonstrate any effect on satisfaction rates by the duration of diabetes. This finding may be explained by the fact that many patients in our environment are not well informed about their illnesses, so their knowledge of the illnesses does not necessarily increase as the duration of their illnesses increases, hence may not affect their desire for attention and consequent treatment satisfaction. This finding was in keeping with reports by Udonwa et al[44] in Calabar where there was no significant association between satisfaction and duration of illness. This similarity could be explained by the fact that both studies were carried out in the same South-South geopolitical zone of Nigeria. However, it contrasted with the finding by Othman et al[25] in the United Arab Emirates where there was a significant association between the duration of disease and treatment satisfaction with higher satisfaction among those with a higher duration of diabetes.

In conclusion, this study identified that the use of oral anti-diabetic agents, the presence of complications, and some doctor-related and practice-related characteristics like accessibility and convenience, interpersonal manner, time spent with doctor, technical quality, and communication were factors associated with patient satisfaction. It, however, did not show a significant association between patient satisfaction and glycaemic control. It should however be noted that seeing the hospital-based nature of this study, it may not have been fully representative of the community considering that most dissatisfied clients may no longer be attending the clinic for follow-up.

In order to improve patient satisfaction with care for diabetics, the following measures were recommended. Viz:
- Patients, who are treated with insulin and have diabetes complications, should be targeted as a unique group among diabetic patients and given more attention by counseling so as to improve their satisfaction and quality of life.
- Patient waiting time should be also evaluated and ideally reduced or used as an opportunity for patient education and consequently improve patient satisfaction.
- Consultation techniques with an emphasis on patient-centeredness should be taught in medical training institutions to improve patient satisfaction with clinical consultation.

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