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A Retrospective Review of Documented Diabetes Self-Care Practices and Their Association with The Prevalence of Complications Among Type 2 Diabetic Patients in A Tertiary Health Care Facility in South-South Nigeria

Daughter Awala Owonaro[1], Peter A. Owonaro[2,3]*, Ayibapreye Kari[4], Henary Messiah[2,3], Providencia Chichi Olodiama[2,3]

[1]*Department of Family Medicine, Niger Delta University, Wilberforce Island, Bayelsa State, Nigeria.*
[2]*Department of Clinical Pharmacy, Niger Delta University, Wilberforce Island, Bayelsa State, Nigeria.*
[3]*Department of Clinical Pharmacy, Bayelsa Medical University, Yenagoa, Bayelsa State, Nigeria.*
[4]*Department of Microbiology, Bayelsa Medical University, Yenagoa, Bayelsa State, Nigeria.*
**Corresponding author: Peter A. Owonaro.*

Abstract

Introduction: Type 2 diabetes mellitus (T2DM) is a growing public health concern in Nigeria, with rising prevalence and a high rate of preventable complications. Inadequate self-care practices among patients contribute significantly to poor glycemic control and increased morbidity.

Aim/Objective: This study assessed the level of diabetes self-care skills among adult patients with T2DM and examined the relationship between self-care practices and the occurrence of diabetes-related complications in a tertiary health facility in South-South Nigeria.

Materials and Methods: A hospital-based retrospective cross-sectional study was conducted among 244 adult T2DM patients attending the Federal Medical Centre, Yenagoa. Data were extracted from patients' clinical folders and analyzed using descriptive statistics and inferential tests (Chi-square and logistic regression; $p < 0.05$).

Results: A total of 244 patients were enrolled. Female respondents (54.1%) slightly outnumbered males (45.9%). Many patients had inadequate self-care practices: 29.5% rarely or never monitored blood glucose, and 51.6% did not engage in regular physical activity. Microvascular complications were prevalent-neuropathy (36.1%) and retinopathy (29.5%). Hypertension was the most common comorbidity (58.2%). Poor self-care was significantly associated with a higher occurrence of complications.

Conclusion: Suboptimal diabetes self-care remains a major challenge in this setting and is significantly linked to increased complications. Enhanced patient education, structured follow-up, and improved documentation are recommended.

Keywords: type 2 diabetes mellitus; self-care; complications; glycemic control; south-south Nigeria

Introduction

Type 2 diabetes mellitus (T2DM) is a chronic metabolic disorder characterized by persistent hyperglycemia arising from insulin resistance, inadequate pancreatic β-cell insulin secretion, and inappropriate glucagon release [1]. Unlike type 1 diabetes, which is primarily autoimmune, T2DM develops as a consequence of complex interactions between genetic predisposition, lifestyle factors, and environmental influences [4]. Globally, an estimated 537 million adults are living with diabetes, with over 90% having T2DM [7]. The burden is greatest in low- and middle-income countries, including Nigeria, where prevalence ranges from 4% to 11%, and many patients present late with complications due to limited awareness and barriers to quality care [11,17]. Self-care practices-including dietary modification, regular physical activity, medication adherence, blood glucose monitoring, and foot care-are the cornerstone of T2DM management and are directly linked to glycemic control and complication prevention [15]. Conversely, poor glycemic control in type 2 diabetes is strongly associated with the development of microvascular, macrovascular, and neuropathic complications [6]. However, adherence to these practices remains poor in Nigeria [3]. Despite the well-established relationship between self-care and outcomes, limited data exist from South-South Nigeria on how self-care behaviors influence complication patterns. This study therefore, assessed the level of diabetes self-care skills among adult T2DM patients and examined its association with the prevalence of diabetes-related complications at a tertiary health facility in the region.

The Main Objective of The Study

This study aimed to evaluate the level of diabetes self-care skills among adult patients with type 2 diabetes mellitus and determine its association with the prevalence of diabetes-related complications in a tertiary healthcare facility in South-South Nigeria.

Materials and Methods

Study Population

Adult patients with a confirmed diagnosis of T2DM attending the Outpatient Diabetes Clinic of the Federal Medical Centre (FMC), Yenagoa, Bayelsa State, between January and September 2025.

Study Design

This was a hospital-based retrospective cross-sectional study.

Study Setting

The Federal Medical Centre, Yenagoa, is a tertiary healthcare institution and major referral centre for Bayelsa State and the South-South region of Nigeria. The study was conducted in the Medical Outpatient Department and Diabetes Clinic.

Inclusion and Exclusion Criteria

Inclusion Criteria: (a) Adult patients aged 18 years and above with a confirmed T2DM diagnosis for at least 6 months before the review period; (b) patients with complete medical records containing sociodemographic information, documented diabetes self-care practices, and clinical evidence of complications.

Exclusion Criteria: (a) Patients with type 1 diabetes mellitus or gestational diabetes; (b) patients with incomplete, missing, or illegible records; (c) patients newly diagnosed during the review period with insufficient follow-up documentation.

Data Collection Instrument

A structured data extraction form was developed based on the study objectives and used to extract data from patients' case notes, laboratory reports, and clinic registers. The form captured: (a) sociodemographic and clinical characteristics, (b) documented diabetes self-care practices (medication adherence notes, dietary and lifestyle counseling, glucose monitoring records, foot-care documentation), and (c) documented diabetes-related complications.

Ethical Consideration

Ethical approval was obtained from the Research and Ethics Committee (REC) of FMC Yenagoa (Protocol No. 0671; Application No. FMCY/REC/ECC/2025/NOV/969). As the study used existing medical records, informed consent was waived. Patient confidentiality was strictly maintained; identifiers were not recorded, and extracted data was coded and stored securely.

Sampling Calculation

Using the Yamane Taro formula - $n = N/[1 + N(e)^2]$ - with an estimated clinic attendance of N = 500 and a margin of error of 5%, the minimum sample size was calculated as 222. An additional 10% was added to account for attrition, giving a total sample of 244 participants.

Sampling Technique

A purposive sampling technique was applied. Eligible patient folders were deliberately selected from the diabetes clinic register and the medical records department based on predefined inclusion and exclusion criteria until the required sample was achieved.

Data Analysis

Data were analyzed using SPSS version 27 and Microsoft Excel. Descriptive statistics (frequency, percentage, mean, and standard deviation) summarized sociodemographic and clinical variables. Inferential statistics - including Chi-square tests and logistic regression - assessed associations between self-care practices and complications. Statistical significance was set at $p < 0.05$.

Results

Sociodemographic Characteristics of Respondents

A total of 244 patients were enrolled. Female respondents (54.1%) slightly outnumbered males (45.9%). The majority were in the 45-54 age group (30.3%), were married (63.1%), and had been living with T2DM for 5-<10 years (26.2%). More than half (56.6%) had received diabetes education in the past 12 months. Most had never used tobacco (66.4%), and the majority reported no or only occasional alcohol use.

Table 1: Sociodemographic & Clinical Characteristics of Respondents (n = 244).

Variable	Category	Frequency (n)	Percentage (%)
Age (Years)	18-34	22	9.0
	35-44	46	18.9

	45-54	74	30.3
	55-64	62	25.4
	65-74	30	12.3
	≥75	10	4.1
Sex	Male	112	45.9
	Female	132	54.1
Marital Status	Single	48	19.7
	Married	154	63.1
	Widowed	30	12.3
	Divorced/Separated	12	4.9
Duration Since Diagnosis	6-11 months	26	10.7
	1-<3 years	62	25.4
	3-<5 years	58	23.8
	5-<10 years	64	26.2
	≥10 years	34	13.9
Diabetes Education (Past 12 Months)	Yes	138	56.6
	No	84	34.4
	Unsure	22	9.0
Tobacco Use	Never	162	66.4
	Former	52	21.3
	Current	30	12.3
Alcohol Use	None	88	36.1
	Occasional	84	34.4
	Moderate	52	21.3
	Heavy	20	8.2

Table 1.1: Age Group × Diabetes-Related Complications.

Age Group (years)	Complications Present n (%)	No Complications n (%)	Total
18-34	10 (45.5)	12 (54.5)	22
35-44	22 (47.8)	24 (52.2)	46
45-54	52 (70.3)	22 (29.7)	74
55-64	48 (77.4)	14 (22.6)	62
65-74	26 (86.7)	4 (13.3)	30
≥75	8 (80.0)	2 (20.0)	10
Total	166 (68.0)	78 (32.0)	244

Table 1.2: Duration Since Diagnosis × Diabetes-Related Complications.

Duration	Complications Present n (%)	No Complications n (%)	Total
6–11 months	8 (30.8)	18 (69.2)	26
1-<3 years	30 (48.4)	32 (51.6)	62
3-<5 years	42 (72.4)	16 (27.6)	58
5-<10 years	54 (84.4)	10 (15.6)	64
≥10 years	32 (94.1)	2 (5.9)	34
Total	166 (68.0)	78 (32.0)	244

Table 1.3: Diabetes Education (Past 12 Months) × Complications.

Diabetes Education	Complications Present n (%)	No Complications n (%)	Total
Yes	82 (59.4)	56 (40.6)	138
No/Unsure	84 (79.2)	22 (20.8)	106
Total	166 (68.0)	78 (32.0)	244

Diabetes Self-Care Skills Assessment

Assessment of self-care practices revealed significant gaps. Only 23.0% of patients monitored their blood glucose daily, and 59.8% did not keep glucose records. Although 86.1% were currently on medication, more than half missed doses at least occasionally. Dietary counseling had been received by 61.5% of patients, yet 30.3% never followed a meal

plan. Regular physical activity was documented in only 48.4% of patients, and 61.5% did not perform daily foot inspection.

Table 2: Diabetes Self-Care Skills Assessment (n = 244).

Self-Care Variable	Response	Frequency (n)	Percentage (%)
Formal Diabetes Education	Yes	144	59.0
	No	100	41.0
Knowledge of Target Glucose	Yes	132	54.1
	No	112	45.9
Blood Glucose Monitoring	Daily	56	23.0
	Weekly	62	25.4
	Monthly	54	22.1
	Rarely	42	17.2
	Never	30	12.3
Keeps Glucose Records	Yes	98	40.2
	No	146	59.8
Currently on Medication	Yes	210	86.1
	No	34	13.9
Misses Medication Doses	Never	104	42.6
	Occasionally	88	36.1
	Frequently	36	14.8
	Always	16	6.6
Dietary Counseling Received	Yes	150	61.5
	No	94	38.5
Follows Meal Plan	Always	72	29.5
	Sometimes	98	40.2
	Never	74	30.3
Regular Physical Activity	Yes	118	48.4
	No	126	51.6
Daily Foot Inspection	Yes	94	38.5
	No	150	61.5
Knows Hypoglycemia Signs	Yes	118	48.4
	No	126	51.6

Table 2.1: Formal Diabetes Education × Glycemic Control.

Formal Education	Good Control n (%)	Poor Control n (%)	Total
Yes	88 (61.1)	56 (38.9)	144
No	34 (34.0)	66 (66.0)	100
Total	122 (50.0)	122 (50.0)	244

Table 2.2: Medication Adherence × Glycemic Control.

Adherence Level	Good Control n (%)	Poor Control n (%)	Total
Never miss	72 (69.2)	32 (30.8)	104
Occasionally	36 (40.9)	52 (59.1)	88
Frequently/Always	14 (26.9)	38 (73.1)	52
Total	122 (50.0)	122 (50.0)	244

Table 2.3: Physical Activity × Glycemic Control.

Physical Activity	Good Control n (%)	Poor Control n (%)	Total
Yes	70 (59.3)	48 (40.7)	118
No	52 (41.3)	74 (58.7)	126
Total	122 (50.0)	122 (50.0)	244

Prevalence of Diabetes-Related Complications

The prevalence of complications was high. Hypertension was the most common comorbidity

(58.2%), followed by neuropathy (36.1%), retinopathy (29.5%), sexual dysfunction (21.3%), nephropathy (18.9%), and foot ulcers (15.6%). Cardiovascular complications were documented in 18.9% of patients, and 32.0% had been hospitalized due to diabetes. Most first complications occurred 1-5 years after diagnosis.

Table 3: Prevalence of Diabetes-Related Complications (n = 244).

Complication-Related Variable	Category	Frequency (n)	Percentage (%)
Experienced Complications	Neuropathy	88	36.1
	Retinopathy	72	29.5
	Nephropathy	46	18.9
	Foot Ulcers	38	15.6
	Sexual Dysfunction	52	21.3
	Hypertension	142	58.2
	None	54	22.1
Hospitalized Due to Diabetes	Yes	78	32.0
	No	166	68.0
Cardiovascular Complications	Yes	46	18.9
	No	198	81.1
Recurrent Infections	Never	54	22.1
	Rarely	62	25.4
	Sometimes	78	32.0
	Often	36	14.8
	Always	14	5.7
Time of First Complication	< 1 year	34	13.9
	1–5 years	86	35.2
	> 5 years	70	28.7
	Not Applicable	54	22.1

Table 3.1: Any Diabetes-Related Complication × Hospitalization.

Complications	Hospitalized n (%)	Not Hospitalized n (%)	Total
Yes	68 (41.0)	98 (59.0)	166
No	10 (12.8)	68 (87.2)	78
Total	78 (32.0)	166 (68.0)	244

Table 3.2: Cardiovascular Complications × Hospitalization.

Cardiovascular Complication	Hospitalized n (%)	Not Hospitalized n (%)	Total
Yes	28 (60.9)	18 (39.1)	46
No	50 (25.3)	148 (74.7)	198
Total	78 (32.0)	166 (68.0)	244

Table 3.3: Time of First Complication × Hospitalization.

Time after Diagnosis	Hospitalized n (%)	Not Hospitalized n (%)	Total
< 1 year	18 (52.9)	16 (47.1)	34
1-5 years	36 (41.9)	50 (58.1)	86
> 5 years	24 (34.3)	46 (65.7)	70
Not applicable	0 (0.0)	54 (100.0)	54
Total	78 (32.0)	166 (68.0)	244

Discussion

This study assessed diabetes self-care practices and their relationship with the prevalence of complications among T2DM patients at a tertiary facility in South-South Nigeria. The findings show that a high proportion of patients had diabetes-related complications and that many did not adequately practice recommended self-care measures.

Sociodemographic and Clinical Characteristics of Respondents

Female respondents slightly outnumbered males, consistent with better health-seeking behavior among women reported in Nigerian hospital-based diabetes

studies [10]. Most patients were married, though marital status alone did not reduce complication rates, suggesting that self-care practices and support systems are more determinative than marital status.

Complications were more common among older patients and those with longer diabetes duration. Patients with a disease duration of 10 years or more had complication rates exceeding 90%, consistent with the well-established relationship between prolonged hyperglycemia and cumulative tissue damage [16]. Patients who received diabetes education in the past 12 months showed significantly fewer complications, reinforcing the value of regular education-based interventions [13].

Diabetes Self-Care Skills Assessment

Self-monitoring of blood glucose (SMBG) was poorly practiced-only about one-quarter of patients monitored daily, and most did not keep glucose records. This pattern is consistent with findings from other LMICs where cost, limited access to glucometers, and inadequate education limit regular monitoring [8]. Poor medication adherence was also common; more than half reported missing doses at least occasionally, which is strongly linked to poor glycemic control and increased complication risk [12]. Less than half of patients engaged in regular physical activity, and many did not follow recommended dietary plans despite prior counseling. This demonstrates that knowledge alone does not guarantee sustained behavioral change. Physically active patients showed better glycemic control, consistent with the known role of exercise in improving insulin sensitivity [5]. Gaps in preventive self-care-including foot inspection and hypoglycemia awareness-further increase the risk of avoidable complications [9].

Prevalence of Diabetes-Related Complications

Hypertension was the most common comorbidity, which is unsurprising given its frequent co-occurrence with T2DM and its role in amplifying cardiovascular risk [1]. High rates of neuropathy, retinopathy, and nephropathy are comparable to reports from other tertiary hospitals in Nigeria and sub-Saharan Africa [17], confirming the regional relevance of these findings. Patients with cardiovascular complications were more than twice as likely to be hospitalized, consistent with global evidence on cardiovascular disease as the leading cause of morbidity and mortality in T2DM [14]. Early-onset complications-within one year of diagnosis-were associated with higher hospitalization rates, suggesting late presentation or delayed diagnosis, a pattern commonly reported in resource-limited settings [2].

Conclusion

This study demonstrates that inadequate diabetes self-care skills are common among T2DM patients in South-South Nigeria and are significantly associated with poor glycemic control and a higher prevalence of complications. The occurrence of complications increased with advancing age, longer disease duration, and poor adherence to self-care practices. Formal diabetes education, medication adherence, and regular physical activity were significantly associated with better outcomes.

Strengthening diabetes self-management education and support (DSMES), improving access to blood glucose monitoring tools, reinforcing lifestyle modification counseling, and enhancing documentation of self-care practices should be priorities in tertiary healthcare settings. Pharmacists and other healthcare professionals are critical to patient education, adherence support, and continuous follow-up. Addressing socioeconomic and health-system barriers to self-care is essential for reducing the burden of diabetes-related complications in Nigeria.

Abbreviations

T2DM: Type 2 Diabetes Mellitus; DSMES: Diabetes Self-Management Education and Support; ADA: American Diabetes Association; IDF: International Diabetes Federation; FMC: Federal Medical Centre; SMBG: Self-Monitoring of Blood Glucose LMICs: Low- and Middle-Income Countries

Declarations

Acknowledgment

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Conflict of Interest

The authors declare that there was no conflict of interest in the conduct and reporting of this research.

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