

Assessment of Diabetes Self-Care Knowledge and Satisfaction with Care among Type 2 Diabetes Patients-A Case Study

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Abstract

Many persons with diabetes are not achieving treatment goals due to inadequate knowledge and poor self-management skills. Assessment of diabetes patients' knowledge and self-care skills could help design strategies to improve treatment outcomes. The study was aimed at assessing the dietary and self-care knowledge of patients with type 2 diabetes and determining the level of satisfaction with the care offered. 130 patients with type 2 diabetes were consecutively recruited from the out-patient and medical wards. Knowledge of self-care and patient satisfaction were assessed using a 42-item validated pretested questionnaire and an 8-item patient satisfaction questionnaire respectively. Data analysis was done with the aid of Spss V 16 and Graph pad InStat V2.05. Factor analysis was performed to determine appropriate components of patient satisfaction. The level of significance was set at $p < 0.05$. 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. The majority, 126(96.9%) were unaware that foot examination was an 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, Knowledge, Patient satisfaction, Nigeria

INTRODUCTION

Diabetes is a chronic metabolic disease associated with micro vascular and macro vascular complications, which can have a devastating effect on the quality of life [1, 2]. Global prevalence in the adult population is estimated to be 536.6 million. This is projected to rise to 570.9 million in 2025 and 783.2 million by 2045 [3, 4]. Prevalence of diagnosed and undiagnosed diabetes in developing countries is on the rise and fast becoming a major public health problem [5]. The increased prevalence is especially noticeable in developing countries of the world where diabetes is now a major public health problem [5]. In Nigeria, although a world bank report puts the prevalence at 3.6%, prevalence rates ranging from 0.65% to 10% have been reported depending on the location of study [6-8]. It has been estimated that about 60% of persons with diabetes are not achieving treatment goals and only 3.5% of persons in developing countries can attain Glycemic, lipid and blood pressure recommended treatment goals [9, 10]. This may be attributable to inadequate knowledge of the disease and consequently poor self-management skills [11]. Assessment of diabetes patients' knowledge and satisfaction with care is therefore very important in helping patients obtain better outcomes in the management of their disease. The objective of this work was

to assess dietary and self-management knowledge of type 2 patients with diabetes, determine the level of satisfaction with the care offered to patients with diabetes and explore variables affecting patient satisfaction with care.

MATERIALS AND METHODS

Setting

The study was carried out in the central hospital, Warri, Delta State, Nigeria. The hospital is a 200-bed facility with 35 medical doctors, 11 registered pharmacists, 8 laboratory

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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 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.

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

$$n = N / (1 + N(e^2)) \quad (1)$$

where:

n= The sample size, N=Total number of population, e=the level of precision or margin of error (0.05),

Therefore,

$$n = 300 / (1 + 300(0.05)^2) \quad (2)$$

$$n = 171.43$$

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, and presence of complications. Knowledge was assessed by using a 47-item validated instrument [13]. The questionnaire assessed the patient’s knowledge of symptoms and management of diabetic emergency, actions to take in the event of hyperglycemia, hypoglycemia, and when the patient is sick, frequency of preventive eye and foot check-ups as well as the use of herbal and complementary medicines.

Patient satisfaction was assessed using an 8-item questionnaire with a 5-point Likert type response scale [14]. The questionnaire explored satisfaction with care along the following lines: care given by staff, the interest shown in disease condition, explanation of the 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 [15]. Graph pad InStat version 2.05 was used for inferential analysis [16]. 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, with 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. Ethical Permit no HREC/ CH/ 13/ 0045. Informed consent was obtained in writing from each participant in the study

RESULTS AND DISCUSSION

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 50-59 years. There were 47(36.2%) insulin-treated type 2 diabetic patients while 20(15.4%) were on insulin and oral hypoglycemic agents, **Table 1.**

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

Item	Frequency (%)
Age	
30 – 39	13(10.0)
40 – 49	21(16.2)
50 – 59	53(40.8)
Above 60	43(33)
Gender	
Male	63 (48.5)
Female	67 (51.5)
Marital Status	
Single	7 (5.4)
Married	111 (85.4)
Divorced	6 (4.6)
Widow	6 (4.6)
Occupation	
Civil servant	20(15.4)
Businessman/woman	22(16.9)
Trader	44(33.8)
Teacher	3(2.3)
Student	6(4.6)
Unemployed	35(27.0)
Level of Education	
No formal education	20(15.3)
Primary school	46(35.4)
Secondary school	39(30.0)

Tertiary education	25(19.3)
Average monthly income (Naira)*	
<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 = U S \$ 17 approx.

Amputation	1(0.8)
Retinopathy	70(53.8)
Blindness	1(0.8)
C HF	4 (3.1)
Stroke	4 (3.1)
Therapy (Diet)	
Compliant	48(32.9)
Non -compliant	82(63.1)
Therapy (Drug)	
Oral hypoglycemic	103(79.2)
Insulin	47(36.2)
Herbal medicine	10(7.7)
Complimentary & alternate medicine	3(2.3)

Clinical Characteristics

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

Table 2. Clinical characteristics and drug therapy profile of diabetic patients

Item	Frequency (%) N=130
Fasting blood sugar mg/dL	
60 – 120 normal	21 (16.2)
<120	109(83.8)
BMI kg/m²	
< 18.5 underweight	6(4.6)
13.5 – 24.4 Normal	49(37.7)
25 – 27 Overweight	13(10)
27.1 – 33 Obese	42(32.2)
>33 severe obese	20(15.4)
Comorbidity	
Hypertension	53(40.8)
Foot ulcer	12 (9.2)

Knowledge and Self-Care Skills

Self-care skills of patients with diabetes were very low, mean total score of 33.33%. Only 48 (36.9%) could correctly recognize symptoms of hypoglycemia. Less than 30% of respondents knew the right action to take in the event of hypoglycemia and hyperglycemia. 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 were also very low among the patients. The majority, 126(96.9%) were unaware that a foot examination was important during each clinic visit. Only 6(4.6%) agreed that a yearly eye examination was important. More than three-quarters of respondents, 107(82.3%) did not have the practice of carrying an emergency supply of sugar or another source of energy in the event of hypoglycemia. Nearly one-third of respondents, 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 (Hyperglycemia)	110(84.6)
Feeling extremely hungry, sweating, having a headache, double vision or tremor (Hypoglycemia)	48(36.9)
Action patient would take if he/she had symptoms thought to be associated with high blood glucose level	
Increase diabetic medication	30(23.1)
Continue diabetic medication	20(15.4)
Seek help immediately	78(60.0)
Action patient would take if he/she had symptoms thought to be associated with high blood glucose level	
Decrease diabetic medication	9(6.9)
Eat some sugar	43(33.1)
Seek help immediately	59 (45.4)
Action patient would take if he/she felt too unwell to eat	
Reduce my diabetic medication	2(1.5)
Drink sugary drinks	3(2.3)
Seek help immediately	46(35.4)
Mean total	31.33%

Table 4. Self Care practices relating to preventive Care for Patients with diabetes

Item	Response N (%)		N=130		
	Yes	No			
Do you carry an emergency supply of sugar or energy food with you?	23(17.7)	107(82.3)			
If you run out of your diabetic medications, would you ever use plant or herbal to control your sugar level?	40(30.8)	90(62.2)			
	Never/Not aware	Yearly	Each clinic visit	If I notice something wrong	
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)	

Patient Satisfaction

The patient satisfaction questionnaire had an acceptable level of internal consistency (Cronbach’s alpha, 0.8446). Generally, patients indicated a high level of satisfaction with care, mean of 3.81 range of 1-5. The level of satisfaction was highest for competence, time spent with patients 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 of 3.77, 3.71, 3.79 and 4.02 respectively, **Tables 5 and 6.**

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

s/no	Item	Mean (SD)	% Positive	Factor Loading
1	How friendly and caring were the staff	3.86(0.64)	80.0	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	0.710
5.	Their efforts to help you to improve your health and stay healthy	3.79(0.52)	78.5	0.610
6.	How well do they answer your questions or allow you to ask questions	3.72(0.68)	73.8	0.572
7.	Time spent with you	3.86(0.63)	78.3	0.630
8.	Thoroughness and competence of the hospital staff	4.02(0.07)	83.1	0.502
	Mean total	3.81 (0.08)		

Table 6. Descriptive statistics of components of satisfaction

Component	N	Sub Group	
		Mean	(SD)
1. Friendly explanation	2	3.77	(0.69)
2. Therapy management	2	3.71	(0.77)
3. Attitude	3	3.79	(0.62)
4. Resource availability	1	4.02	(0.69)

This was a descriptive cross-sectional study assessing type 2 diabetes patient knowledge and self-management skills. The predominant age group falls within the observed peak age for patients with type 2 diabetes [17]. 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 a diabetic diet among patients. This may be because most of the patients were in the low-income group earning between 10000 and 50000 Naira (U S \$16- 85) per month. The diabetes staple food in the area of study is quite expensive and may be

beyond the reach of low-income earners. Poverty has been shown to adversely affect the quality of care and adherence to medication among patients with diabetes [18-20].

Fasting blood sugar levels exceeded the normal limit (120mg/dl) for the majority of the patients, many of whom presented with complications at the time of diagnosis. Other studies in Nigeria have also reported poor glycemic control and the presence of high levels of complications among patients with diabetes [21-23]. 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 [24]. 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. All professionals involved in caring for patients with diabetes should give emphasis to patient self-care and self-education.

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 [25-28]. There is a need for a similar level of involvement by pharmacists in developing countries.

The 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 Ethiopia, [29] and other sub-Saharan African countries. [30, 31]. This is especially worrisome because diabetes is a disease for which a high degree of patient involvement is needed to achieve successful care and adequate control and is dependent on the level of patient knowledge and self-management skills [32].

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

CONCLUSION

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

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REFERENCES

1. WHO (World Health Organization) Fact sheet –Diabetes. Available from: <https://www.who.int/news-room/fact-sheets/detail/diabetes>. Accessed 20/3/22
2. Wang L, Peng W, Zhao Z, Zhang M, Shi Z, Song Z et al. Prevalence and Treatment of Diabetes in China, 2013-2018. *JAMA*. 2021;326(24):2498-506. doi:10.1001/jama.2021.22208
3. Lin X, Xu Y, Pan X, Xu J, Ding Y, Sun X, et al. Global, regional, and national burden and trend of diabetes in 195 countries and territories: an analysis from 1990 to 2025. *Sci Rep*. 2020;10(1):1-1. doi:10.1038/s41598-020-71908-9

4. Sun H, Saeedi P, Karuranga S, Pinkepank M, Ogurtsova K, Duncan BB, et al. IDF Diabetes Atlas: Global, regional and country-level diabetes prevalence estimates for 2021 and projections for 2045. *Diabetes Res Clin Pract*. 2022;183:109119. doi:10.1016/j.diabres.2021.109119
5. Seiglie JA, Marcus ME, Ebert C, Prodromidis N, Geldsetzer P, Theilmann M, et al. Diabetes prevalence and its relationship with education, wealth, and BMI in 29 low-and middle-income countries. *Diabetes Care*. 2020;43(4):767-75.
6. THE WORLD BANK Diabetes prevalence (% of population ages 20-79). Available from: <https://data.worldbank.org/indicator/SH.STA.DIAB.ZS?locations=N> G. Accessed 15/6/22
7. Akinkugbe OO (Ed). Non-communicable diseases in Nigeria: a national survey (final report) on hypertension, coronary heart disease, diabetes mellitus, G6PD deficiency, and anaemia. National Expert Committee on Non-Communicable Disease. Federal Ministry of Health and Social Services, Lagos, 1997.
8. Cookey SN, Gomba V, Wariboko CM. Prevalence of Diabetes in Rural Communities in South South and South East Nigeria A Retrospective, Cross-Sectional Community Based Survey. *IOSR J Dent Med Sci*. 2022;21(2):26-32.
9. Avramidis I, Apsimidou A, Lalia AZ, Petridis N, Tourtouras E, Kalopitas G, et al. Lessons from a Diabetes Clinic: Achieving Glycemic Goals and Clinical Use of Antidiabetic Agents in Patients With Type 2 Diabetes. *Clin Diabetes*. 2020;38(3):248-55.
10. Widyahening IS, Khunti K, Vos RC, Chew BH. Achieving Effective Management and Treatment of Diabetes Mellitus in Future Primary Care. *Front Endocrinol*. 2022;13:854244. doi:10.3389/fendo.2022.854244
11. Alemayehu AM, Dagne H, Dagne B. Knowledge and associated factors towards diabetes mellitus among adult non-diabetic community members of Gondar city, Ethiopia 2019. *PloS one*. 2020;15(3):e0230880. doi:10.1371/journal.pone.0230880
12. Yamane T. *Statistics, An Introductory Analysis* 2nd Ed., New York: Harper and Row. 1967.
13. Richford KM, Richford AP, Magil C. Do rural South African patients know how to manage their disease? *Diabetes Int*. 2001;(3):86-90.
14. Parkton PH, Wagner EH, Smith DG, Sytraley HL. Effect of part-time practice on patient outcomes. *J Intern Med*. 2003;18(9):717-24.
15. SPSS for Windows, Rel. 16.0.1. Chicago: SPSS Inc. 2008.
16. Graph Pad InStat TM, software V2.05a 9342, San Diego, USA. Available from: <http://www.graphpad.com>.
17. Kyrou I, Tsigos C, Mavrogianni C, Cardon G, Van Stappen V, Latomme J, et al. Sociodemographic and lifestyle-related risk factors for identifying vulnerable groups for type 2 diabetes: a narrative review with emphasis on data from Europe. *BMC Endocr Disord*. 2020;20(1):1-3. doi:10.1186/s12902-019-0463-3
18. Hsu CC, Lee CH, Wahlqvist ML, Huang HL, Chang HY, Chen L, et al. Poverty increases type 2 diabetes incidence and inequality of care despite universal health coverage. *Diabetes Care*. 2012;35(11):2286-92. doi:10.2337/dc11-2052
19. Hill-Briggs F, Adler NE, Berkowitz SA, Chin MH, Gary-Webb TL, Navas-Acien A, et al. Social Determinants of Health and Diabetes: A Scientific Review. *Diabetes Care*. 2020;44(1):258-79. doi:10.2337/dci20-0053
20. Okoye OC, Ohenhen OA. Assessment of diabetes self-management amongst Nigerians using the diabetes self-management questionnaire: a cross-sectional study. *Pan Afr Med J*. 2021;40:178. doi:10.11604/pamj.2021.40.178.28584
21. Ibrahim AO, Agboola SM, Elegbede OT, Ismail WO, Agbesanwa TA, Omolayo TA. Glycemic control and its association with sociodemographics, comorbid conditions, and medication adherence among patients with type 2 diabetes in southwestern Nigeria. *J Int Med Res*. 2021;49(10):03000605211044040. doi:10.1177/03000605211044040
22. Attoye TE, Adebobola PA, Inem V. An Assessment of Glycaemic Control and Modes of Health Financing among Type 2 Diabetic Patients Attending a Teaching Hospital in South-western Nigeria. *West Afr J Med*. 2020;37(3):237-47.
23. David EA, Aderemi-Williams RI, Soremekun RO, Nasiru IY, Auta A. Glycemic control and its determinants among patients with type 2

- diabetes in a specialist hospital in Northeast, Nigeria. *SAJ Pharm Pharmacol.* 2019;6(1):105.
24. Enikuomehin AC, Olamoyegun MA, Ojo OA, Ajani GD, Akinlade TA, Ala OA. The pattern of Self-care practices among type 2 diabetes patients in Southwest, Nigeria. *Niger J Clin Pract.* 2021;24(7):978-85. doi:10.4103/njcp.njcp_527_20
 25. Pousinho S, Morgado M, Plácido AI, Roque F, Falcão A, Alves G. Clinical pharmacists' interventions in the management of type 2 diabetes mellitus: a systematic review. *Pharm Pract.* 2020;18(3):2000. doi:10.18549/PharmPract.2020.3.2000
 26. Jamshed SQ, Siddiqui MJ, Rana B, Bhagavathula AS. Evaluation of the Involvement of Pharmacists in Diabetes Self-Care: A Review from the Economic Perspective. *Front Public Health.* 2018;6:244. doi:10.3389/fpubh.2018.00244
 27. Abubakar M, Atif M. Impact of Pharmacist-Led Interventions on Diabetes Management at a Community Pharmacy in Pakistan: A Randomized Controlled Trial. *Inquiry.* 2021;58:00469580211036283. doi:10.1177/00469580211036283
 28. Shi FH, Shen L, Yue J, Ma J, Gu ZC, Li H, et al. Intervention by clinical pharmacists can improve blood glucose fluctuation in patients with diabetes and acute myocardial infarction: A propensity score-matched analysis. *Pharmacol Res Perspect.* 2021;9(2):e00725. doi:10.1002/prp2.725
 29. Moodley LM, Rambiritch V. An assessment of the level of knowledge about diabetes mellitus among diabetic patients in a primary healthcare setting. *South Afr Fam Pract.* 2007;49(10):16-16d.
 30. Odili VU, Isiboge PD, Eregie A. Patients' Knowledge of Diabetes Mellitus in a Nigerian City. *Trop J Pharm Res.* 2011;10(5):637-42.
 31. Okoh BA, Jaja T. Knowledge and awareness of diabetes among adolescents in Port Harcourt, Nigeria. *Afr J Diabetes Med.* 2014;22(2):18-20.
 32. Glasgow RE, Anderson RM. In diabetes care, moving from compliance to adherence is not enough. Something entirely different is needed. *Diabetes Care.* 1999;22(12):2090-2. doi:10.2337/diacare.22.12.2090