


Research Article

Knowledge, Practices and Experiences of Type II Diabetic Patients on Self-Care Management at the Limbe and Buea Treatment Centers

Andigema Sharon Neksang^{1,2} Tendongfor Nicholas¹, Jules Clement Nguedia Assob³, Kah Emmanuel Nji⁴, Njajou Omer³

Abstract

Background: The prevalence of diabetes is increasing globally. The prevalence and burden of type II diabetes are increasing steadily in Sub-Saharan Africa as a result of poor knowledge on the disease and its risk factors, as well as use of disease prevention techniques. Even when patients are well-informed, appropriate self-care management behaviors are not always adopted. This study aimed to assess knowledge, perception and uptake on diabetic self-care management of diabetic patients at the Limbe and Buea Treatment centers in SW Region of Cameroon.

Methods: The study was a cross sectional survey involving diabetic patients randomly selected from the Buea and Limbe regional hospitals. A modified Diabetes Knowledge Test 2 (DKT2) consisting of 22 questions was used to determine the level of knowledge of diabetes as well as self-care management of the disease. The second section of the questionnaire consisted of a modified Diabetic Self-Care Activities questions used to assess patient practices towards Diabetes. Patients' practices and experiences of diabetes were assessed on major lifestyle parameters including diet, exercise, home blood sugar monitor, medication compliance and problem solving using the modified diabetic self-care management questionnaire. Data was analyzed using SPSS version 25. The study was conducted from June to September 2022.

Results: A total of 385 Diabetic were enrolled with the majority (303 (75.3%)) having a good understanding of diabetes. It appears that 324 (84.3%) did not successfully manage their own care, and 314 (81.6%) did not indicate any physical limitations in engaging in any sort of activity. Most, (323(78.3%)) patients said they only exercise occasionally, while 51 (13.2%) affirm to exercise regularly. Regarding medication compliance, the majority of 329 (85.5%) patients occasionally neglected to take their medications, despite the fact that 324 (78.2%) patients consumed alcohol and 290 (75.3%) patients had adequate awareness of their disease.

Educational level, income level, occupation or religion did not show any association with participants' knowledge on self-care management approaches. Singles and unmarried participants were 2.4 times more likely to possess greater understanding of suggested self-care management techniques than those who identified as divorced or married.

Conclusion: Patients had good knowledge on diabetes. Daily adherence to treatment and exercise, which are foundational self-care management behaviors, were poorly practiced. The provision of contextualized diabetic self-care information to patients is still required. Diabetes education should be tailored to the patient's context and ability to cope with lifestyle changes associated with diabetes.

Affiliation:

¹Department of Public Health and Hygiene, University of Buea, Cameroon

²Department of Trainings, Ministry of Public Health, Cameroon

³Faculty of Biomedical Sciences, University of Douala, Cameroon

⁴African Capacity Building Foundation, Harare, Zimbabwe

Corresponding author: Andigema Sharon Neksang. Department of Public Health and Hygiene, Faculty of Health Sciences, University of Buea, P.O. Box 63 - Buea, Cameroon,

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Introduction

Diabetes is a chronic disease that is becoming more prevalent throughout the world, particularly in developing countries [1, 2]. It high mortality and disability burdens are disproportionate in Sub-Saharan African countries [1-6]. There were 680,300 cases of diabetes reported in Cameroon in 2017. The adoption of appropriate self-care management approaches is low and is heavily influenced by patients' poor knowledge, perceptions of their conditions, and experiences. Diabetes prevalence in Cameroon, according to the World Bank collection of development indicators, is high and on a continuous rise [7].

Diabetic self-care management remains the most effective way to reduce and manage diabetic complications. Diabetic self-care management when effectively practiced can prolong life. Cameroon is one of the 32 countries in the International Diabetic Federation (IDF) that have agreed to reduce diabetes complications by encouraging effective self-care management practices among diabetes patients [8-10]. It is and will be of utmost importance to ascertain patient knowledge, perceptions, and experiences in order to relate how these can affect the adoption of self-care management practices [2, 11-14]. The knowledge, perceptions, and experiences of type II diabetic patients at the Limbe and Buea Treatment Centers were evaluated in this study.

Materials and Methods

Study Design

A cross-sectional hospital-based survey was conducted with 385 diabetic patients from the Buea and Limbe regional hospitals.

Study Setting

This study was conducted at the Limbe and Buea regional hospitals in Fako Division, South West Region, Cameroon. Fako covers an area of 2093 km² and has a population of 534,854 people. The Buea and Limbe Regional Hospitals are the major hospitals in Fako, and they have diabetic clinics with regular follow-up days and receive more diabetic patients.

Study Population

The study included diabetic patients who had been receiving treatment at the Buea and Limbe regional hospitals for at least 6 months. Only patients aged 21 or more were eligible for the study. Patients, who were too sick to participate in the study, as well as pregnant women, were excluded. The sample size was calculated using the single population proportion formula by Karimollah [15]. The study enrolled 385 diabetic patients, with 105 coming from the

Limbe Regional Hospital and 280 from the Buea Regional Hospital.

Sampling technique

Health facilities were purposefully chosen from a list of public hospitals based on the availability of diabetic follow-up care centers and registered patients population. Participants were recruited into the study using a purposive sampling technique with voluntary consent to participate after a thorough explanation of the study's purpose.

Purposive sampling was used to recruit participants into Focus group discussions (FGDs) and in-depth interviews (IDIs) in each health facility. This was done with the help of health care providers and was also closely guided by regular visits, inclusive cultural backgrounds, and credibility

Data Collection

A modified Diabetes Knowledge Test 2 (DKT2) was used to determine the level of diabetes knowledge, and a Diabetic Self-Care Activities questionnaire [1] was used to assess patient practices regarding diabetes. The modified diabetic self-care management questionnaire [1] was used to assess patients' practices and experiences with diabetes and the major lifestyle parameters such as diet, exercise, home blood sugar monitor, medication compliance, and problem solving. The questionnaire comprised of 70 questions. During data collection, participants were explained the objectives and were also told that their participation is voluntary and that they will not be penalized should they withdraw at any point in the course of the interview. Those who accepted to participate in the study signed the consent form. The questionnaires were administered by trained data collectors and in the event where the respondents could read and write the questionnaire was self-administered. The FGDs and Key Informant interviews (KIIs) were conducted in the diabetes Management center. Prior to the interview, participants who had been identified to take part in the discussions were informed. Each cohort of the FGDs was homogeneous and each focus group was conducted between 45mins to 1hr. The FGDs were led by a moderator supported by a note taker and another person who was recording the discussions.

Data analysis

SPSS version 20 was used to analyze the data. Frequencies and percentages were used to summarize the results, which were then displayed in tables and graphs.

Each of the 22 questions on the DKT was scored, with 1 point awarded for the right answer and 0 for the incorrect one. Those who scored 11 or lower were categorized as having poor knowledge, while those who scored 12 or higher were categorized as having good knowledge of the disease and self-care management approaches.

Patients' practices and experiences were assessed using

the modified diabetic self-care management questionnaire, which comprised of 70 questions. A mean score of 36 and above was considered good practice whereas a score below 36 considered poor practices.

A multiple logistic analysis was used to determine the determinants of knowledge on diabetes self-care management. To eliminate confounders, all variables to be tested were first subjected to a multivariate logistic regression model, and those that were statistically significant (P0.05) were then subjected to a unilabiate logistic model

Results

Socio-demographic characteristics of participants

A total of 385 participants were included in the study, and more than half 244 (63.4%) of them were female. Regarding educational attainment, 157 (40.8%) individuals had completed secondary education, compared to 159 (41.3%) participants, who had completed primary school. Below average, 159 (41.3%) of the respondents were Catholic Christians, while 197 (51.2%) of the respondents identified as protestants. Orthodox and Muslims made up 11 (2.9%) and 18 (4.7%) of the study's participants, respectively. Only 43 (11.2%) people reported living in rural communities, compared to 342 (88.8%) who were living in urban communities. 244 (63.4%) of the participants were married while 60 (15.6%) and 75 (19.54%) were single or widowed respectively (Table1).

Participants' knowledge on diabetes and diabetes self-care management

From our findings, 303 (78.7%) of participants had good knowledge on diabetes and diabetic risk factors, while 82 (21.2%) did not understand diabetes and its risk factors. Majority, 301 (78.2%) of the respondents were aware of the best method for testing their glucose levels at home. A few, 24 (6.4%) of the respondents reported urine as the best sample for blood sugar testing, while 5 (1.3%) were unsure which method was best for glucose level testing at home. When asked about the effects of different food types on blood sugar levels, 147 (38.1%) of the respondents said that unsweetened fruit juice raises blood glucose levels. Unsweetened fruit juice, on the other hand, was reported to lower blood glucose levels by 53 (13.9%). A vast majority 229(59.6%) participants were aware that exercise and diet are important in the prevention and management of diabetes. In terms of diabetes symptoms, 267 (69.4%) of respondents agreed that blurred vision is one of the symptoms of diabetes, while 35 (9.1%) were unaware of blurred vision as a symptom of diabetes. Regarding insulin intake, most of the respondents 323 (83.9%) were aware that irregular insulin injection will rise blood glucose level while 62 (16.1%) indicated that the blood glucose level does not changed if insulin is not taken regularly (Table 2). Overall, Out of the 385 respondents, 290

(75.3%) had correct knowledge on diabetes treatment while 95(24.7%) had incorrect knowledge

Participants practices towards diabetes self-care management

Of the 385 respondents, 321 (83.4%) were aware of their unique demands due to diabetes. Above average, 197 (51.2%) of the respondents had altered their treatment plans after starting treatment. There were 188 (40.8%) patients who had never altered their treatment plans. A majority, 321(83.4%) of the respondents reported having attended

Table 1: Socio-demographic characteristics of participants

Variable	n (%)
Gender	
Males	141(36.6)
Females	244(63.4)
Education level	
Primary	159(41.3)
Secondary	157(40.8)
Tertiary	69(17.9)
Religion	
Protestant	197(51.2)
Orthodox	18(4.7)
Catholic	159(41.3)
Muslim	11(2.9)
Location	
Urban	342(88.8)
Rural	43(11.2)
Marital status	
Single	60(15.6)
Married	244(63.4)
Widow(er)	75(19.5)
Divorced	6(1.6)
Living with family	
Yes	358(95)
No	19(5)

Table 2: Participants' knowledge on diabetes and diabetes self-care management

Variable	n (%)
Knowledge of what is diabetes	
Yes	303(78.7)
No	82 (21.2)
The best method for home glucose testing	
Urine testing	24(6.2)
Blood testing	301(78.2)
Both are good	55(14.3)
I don't know	5(1.3)

Effect of unsweetened fruit Juice have on blood glucose	
Lowers it	53(13.9)
Raises it	147(38.1)
Has no effect	120(31.2)
I don't know	65(16.8)
One of the best ways to take care your feet is to massage with alcohol everyday	
Yes	229(59.6)
No	129(40.1)
Exercises and diet are very important in diabetes management	
Yes	348(90.9)
No	2(9.1)
One of the signs of diabetes is blur vision	
Yes	267(69.4)
No	118(30.6)
Blood glucose level increases if insulin is not taken	
Yes	323(83.9)
No	62(16.1)

Table 3: Participants practices towards diabetes self-care management

Variable	Percentage (%)
Have any special diabetic needs	
Yes	321(83.4)
No	64(16.6)
Ever changed diabetes regimen	
Yes	197(51.2)
No	188(48.8)
Ever received lecture on diabetes self-care management	
Yes	321(83.4)
No	64(16.6)
Have any physical limitation that may affect ability to perform self-care	
Yes	71(18.4)
No	314(81.6)
Sometimes forget to take your medication	
Yes	330(85.5)
No	55(14.5)
Alcohol consumption	
Yes	301(78.2)
No	84(21.8)
Regularity of sport	
Some times	301(78.2)
Often	51(13.2)
Rarely	25(6.5)
Never	5(2.1)

lectures on managing diabetes on their own, with 308 (80%) reported having received information from the clinic. 64 (16.6%) of the respondents had not received any official health education about their health situation (Table 3). The physical ability to carry out diabetes self-care activities was unaffected for 314 (81.6%) respondents. Overall, out of the 385 respondents, 99(25.7%) had correct practice on self-care management while 286(84.3%) had incorrect practice on diabetic self-care management

Determinants of knowledge on self-care management of diabetes

Multivariate logistic regression analysis revealed that while gender, location, and marital status were significantly associated with good knowledge of diabetes self-care management approaches, factors such as educational level, income level, occupation, or type of religion had no association with participants' knowledge of diabetes self-care management approaches.

In terms of gender, female participants were **1.7 times (95% CI)** more likely to be knowledgeable about recommended self-care management approaches than male participants. In terms of participant location, those who reported coming from rural areas were 3 times more likely to be knowledgeable about recommended self-care management approaches than those who reported coming from urban settings. The analysis also revealed that participants who reported being single were 2.4 times more likely to be knowledgeable about recommended self-care management approaches than those who reported being divorced or married (Table 4).

Discussion

Participants Knowledge on Diabetes

Majority of diabetic patients at the regional hospital in Buea and Limbe (78.7%) had solid knowledge of diabetes and diabetic self-care management techniques. A majority of the patients (78.2%) knew the best technique to use for checking their blood sugar at home was through blood compared to 5(1.3%), who were unaware of the optimal technique. These findings are consistent with those of earlier studies conducted in Zimbabwe and Saudi Arabia that similarly evaluated the knowledge of diabetic patients using the DKT instrument and found high knowledge levels of 73.1% and 70.1% amongst the participants respectively.

In Cameroon, traditional healing beliefs continue to have a strong influence on diseases, particularly chronic diseases like diabetes, causing problems; as such one will not expect 100% knowledge in such a community [16-18]. Other studies in neighboring Nigeria however found different results of lower (45.0%) levels of knowledge amongst its patients: [19]. One significant knowledge indicator revealed by the findings of this study was patients' ability to understand the effects of different diet types on their blood sugar levels. 38.1% of

Table 4: Determinants of knowledge on self-care management of diabetes

Variable	Total	Knowledge category		COR (95% CI)	P-value	AOR (95%)	P-value
		Incorrect	Correct				
Gender							
Female	244	54(14)	190(49.3)	2.2(1.11-2.41)	0.032	1.7(1.11-2.62)	0.042
Male	141	41(10.7)	100 (26)	1		1	
Total	385	95(24.7)	290(74.3)				
Age group							
22-51	136	36(9.3)	100(25.9)	1.5(0.21-2.71)		1.4(0.22-2.56)	0.07
52-81	240	53(13.7)	187(48.6)	2.1(0.01-3.01)	0.071	2.1(0.01-2.19)	
82-100	9	6(2.3)	3(0.7)	1		-	
Total	385	95(24.7)	290(74.3)				
Educational level							
Primary	159	5(1.3)	154(40)	1.5(0.81-2.45)		-	-
Secondary	157	57(14.8)	100(25.9)	1.3(0.77-1.98)	0.761	-	-
Tertiary	69	33(8.5)	36(9.3)	1			
Total	385	95(24.7)	290(74.3)				
Religion							
Catholic	159	9(2.3)	150(38.9)	1.6 (0.56-1.93)		-	-
Orthodox	18	8(2.1)	10(2.6)	1.4(0.51-2.21)	0.921	-	-
Protestant	197	75(19.5)	122(31.7)	1.8(0.34-2.02)		-	-
Muslim	11	3(0.7)	8(2.0)	1			
Total	385	95(24.7)	290(74.3)				
Location							
Urban	342	92(23.9)	250(64.9)	1		1	
Rural	43	3(0.8)	40(9.4)	3.4(1.31-5.32)	<0.001	3.0(1.23-4.99)	0.012
Total	385	95(24.7)	290(74.3)				
Occupation							
Farmer	75	6(28.6)	69(19.0)	1.2(0.81-1.44)		-	-
Business	231	12(57.1)	219(60.2)	1.6 (0.31-2.21)	0.453	-	-
Unemployed	49	1(4.8)	48(13.2)	0.6(0.21-1.34)		-	-
Civil servant	30	2(9.5)	28(7.7)	1		-	-
Total	385	95(24.7)	290(74.3)				
Marital status							
Married	244	44(11.4)	200(51.9)	2.4(1.21-3.56)		2.4(1.20-3.53)	
Single	60	20(5.2)	40(10.4)	1.5(1.01-2.77)	0.032	1.4(1.02-2.55)	0.031
Widow	75	30(7.7)	45(11.7)	1.6(1.21-2.71)		1.5(1.20-2.56)	
Divorce	6	1(0.2)	5(1.3)	1		1	
Total	385	95(24.7)	290(74.3)				
Income level							
<50000	124	29(7.5)	95(24.7)	1.3(0.92-1.88)		-	-
50000-100000	161	41(10.6)	120(31.2)	1.4(0.64-2.99)	0.882	-	-
101000-250000	82	22(5.7)	60(15.6)	1.2(0.13-1.34)		-	-
>250000	18	3(0.7)	15(1.0)	1		-	-
Total	385	95(24.7)	290(74.3)				

participants reported that unsweetened fruit juice will raise their blood glucose levels conversely to 13.9% that reported that unsweetened fruit juice lowers blood glucose levels. However, unsweetened juice does not have an effect on blood glucose levels. These findings are consistent with previous research findings that revealed that most diabetic patients were unable to understand how different food types affected their blood sugar levels [19]. Understanding the effects of various foods types on blood sugar level is important if one must understand self-care management in diabetes [20]. This is not the case with the results of this study where the knowledge level is relatively high but with a gap in some very significant diabetic knowledge indicators. Contrarily other chronic diseases like hypertension have shown an associated high knowledge and practices amongst it patients [19].

Determinants of knowledge on self-care management of diabetes

Diabetes preventive measures are complex and require long term follow up. Having the necessary diabetes self-care management information remains the best method of controlling DM and preventing further complications. Potential factors that could influence Participants' diabetes self-care management knowledge were also evaluated. Variables were subjected to a multivariate logistic regression model, and variables that were statistically significant ($P < 0.05$) were subjected to a univariate logistic model to eliminate confounders.

Diabetes complications preventive measures involve consistent complex life time changes to be able to have the desired effects. In addition, they particularly rely on one's attitude changes like eating habits which according to a study by Awah et al are very challenging to adopt [8,20,27]. Unexpectedly, educational level, income level, occupation or type of religion did not show any association with participants' knowledge on self-care management approaches. These findings bring to light the fact that when it comes to ill health and respect of patient seeking knowledge on the particular health situation are not always influenced by socioeconomic factors. Sometimes it is the ill state itself that encourages the client to seek for appropriate knowledge.

In Cameroon eating habits are culturally rooted and adapted to social class. This often makes changes in eating habits particularly harder and not easily adopted making often influential factors like educational level and income level non-significant [20, 21]. Even though much research evidence has linked level of knowledge on disease to improvement in behavior change, this is not the case with this study which has a relative higher knowledge compared to poor practices. This can also be explained by the fact that female participants were 1.7 times more likely to be knowledgeable on recommended self-care management approaches compared to the males. These findings are similar to studies conducted by Fatemeh

[20] which also showed an association of knowledge on self-care management approaches with factors like age and gender particularly amongst its female respondents than in males. However, there is a difference in the association with factors like level of education and income levels [21]. Furthermore, several health studies have highlighted the significance of level of economic status and educational level with positive health seeking behaviour including knowledge on various disease situations [20]. It is worth noting that a disease like diabetes has some levels of standardization in terms of its management approaches and educational packages for patients might not vary greatly. Participants' geographic origins were taken into account, and those who came from rural areas knew three times more about suggested self-care management strategies than those from metropolitan areas [3]. It is true as can be explained by health theories like perceived severity and need which refers to a person's subjective assessment of the risk of developing an illness or complication. Most rural participants might fear more risk and severity than urban dwellers who might consider easier accessibility in case of emergency. It is also very common to see rural patients often relocating to urban centers to seek for health care better than some urban dwellers. Feelings of one's own vulnerability to a sickness or disease complication might vary greatly from person to person.

The findings also showed that participants who identified as single were 2.4 times more likely than those who identified as divorced or married to possess greater understanding of self-care management techniques (Table 4). These findings are comparable to those of a study conducted in Uganda, which linked health theories with perceived fear of being alone, which led to better health care seeking behaviors, specifically understanding of one's own health issues. Nonetheless, this makes sense, particularly when you are sick and cannot rely on anybody except yourself. When we do not have family support we become more aware of the need to seek health care services adequately.

Participants practices towards diabetes self-care management

Medication adherence is a key practice in diabetes self-care management; the data showed that up to 85.5% of participants occasionally forget to take their medications. This is a major issue for adherence and the difficulties that follow [21]. Contrarily, just 14.5% of respondents said they always remember to take their medication regularly and on time. According to a study in Ethiopia [22], there is no correlation between the degree of health education and how effectively patients take their medications. Parry and colleagues stated that the reality that diabetes is present in the body becomes more real through glucose monitoring and this does not depend solely on education but a comprehensive look out on numerous issues that hindered their ability to successfully manage their diabetes, like pressure, social

isolation, interpersonal conflicts, sadness, and even fright [7, 10]. However other research work have shown that for any form of health education to results to attitude change the context must be considered and well assessed [23]. The consumption of alcohol by diabetic patients was another factor considered in assessing patients' practices of self-care management. The findings showed 78.2% of the respondents reported to consume alcohol some form of alcohol while 21.8% indicated that they do not consume any form of alcohol. Alcohol is generally linked to increasing the severity especially of chronic diseases like diabetes [24]. The effects of alcohol in health and particularly in diabetes are well documented as well as alcohol consumption and disease epidemiology in the context of Cameroon with especially bear (most consumed alcohol in Cameroon) with high its sugar content [25]. Exercise, which has great advantages for overall health, was also considered to be a desirable practice. 78.2% of the 385 respondents said they occasionally participate in sports, while 13.2% and 6.5% said they do so frequently and infrequently, respectively (Table 3). It is advised that diabetes patients avoid energetic exercise and engage in regular exercise of whatever kind they can support [7]. Although the study's findings indicate a reasonable amount of knowledge about diabetes and self-care management strategies, it is still necessary to put this knowledge into practice for the patient to receive the full benefits.

The benefits of self-care activities like increased exercise cannot be under estimated as it one of the readily available and almost priceless self-care management practices that can be adopted particularly when exercises like walking and daily chores are considered [26]. Respondents with poor practice towards self-care management of diabetes constituted 84.3% while those with good practice made up only 25.7%. There is a direct link between patient practices of DSCM and the outcome of Blood Glucose control [7, 21, 27]. These results also depict that the level of knowledge on the disease might not be directly related to the practices taken by patients as majority reported no physical limitation for them to carry out the self-care activities; one will expect effective up take of all DSCM practices [7, 27] which was never seen in the results.

Conclusion

Patients had strong understanding about diabetes, but this knowledge was not applied to the self-care management routines they should have followed every day to manage their condition and avoid complications. Exercise, which is a fundamental self-care management behavior, was not consistently practiced. Patients reported frequently forgetting to take their medications, and medication adherence was found to be poor. Some reported they were unaware of how insulin injections affected their blood sugar levels even though they took insulin daily. The gap between diabetes self-care education and the practice of diabetes self-care management

requires that diabetes education be customized to the patient's situation and level of adaptability to corresponding lifestyle modifications. Patients must continue to receive contextualized information about managing their diabetes on their own. Every diabetes patient needs to be aware of how to manage their disease and the benefits of self-care. Diabetes education in a setting like Cameroon and Fako should take the patients' demographic history into account while making excellent use of what is easily accessible and affordable.

Limitations

The study was a cross-sectional design and the inferences have limits as they only based on interconnection of self-care adherence patterns. The data collected from self-reported data that can be susceptible to recall bias.

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Conflict of interest

No potential conflict of interest relevant to this article was reported.

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