

Knowledge, practice, and challenges of diabetes foot care among patients at the University of Benin Teaching Hospital, Benin City: A cross-sectional study

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Abstract

Background: Foot ulcer is a common complication of diabetes and the most devastating component of diabetes progression that is associated with high morbidity and mortality. **Aims:** The aim of this study was to assess the knowledge, practice, and challenges of diabetes foot care among patients with diabetes mellitus. **Materials and methods:** This descriptive cross-sectional study assessed knowledge and practice of foot care among type I and type II patients with diabetes attending the University of Benin Teaching Hospital, Benin City. The instrument for data collection was a structured questionnaire with a reliability of 0.880. SPSS version 22 was used to analyze the data. **Results:** The findings revealed that there is good knowledge of foot care, among 110 (50.0%) of the diabetic patients, while the practice of foot care was found to be poor among diabetic patients. It also shows the factor that statistically predicts the development of foot ulcers to include combined diet + oral medications + insulin treatment regimen (adjusted odds ratio [AOR] = 0.181, $P = 0.016$, confidence interval [CI] = 0.045–0.728), history of renal conditions (AOR = 0.115, $P = 0.036$, CI = 0.015–0.871), not receiving foot care education (AOR = 116.098, $P < 0.001$, CI = 12.497–1078.554), and receiving foot care education from nurses (AOR = 0.022, $P = 0.001$, CI = 0.002–0.216). Furthermore, 201 (91.4%) diabetes patients reported fatigue from completing the same task repeatedly, and 198 (90.0%) reported forgetfulness as obstacles to practicing foot care. **Conclusion:** When creating DM Patients future care plans, nurses and other health-care administrators must take into account the difficulties and predicting factors related to the practice of diabetes foot care.

Keywords: Challenges of diabetes foot care, knowledge, Nigeria, practice

Introduction

Diabetes mellitus (DM) is considered one of the leading universal health problems, and it is described as a group of metabolic disorders characterized by high blood glucose levels.^[1,2] This condition is similar to disease *Prameha* mentioned in Ayurveda, where various type of do and don'ts are mentioned for its prevention and management.^[3,4] It is a potentially life-threatening chronic disease and a significant public health concern, with an estimated 463 million adults aged 20–79 years currently living with diabetes.^[5] This represents 9.3% of the world's population in this age group. The total number is predicted to rise to 578 million (10.2%) by 2030 and to 700 million (10.9%) by 2045.^[5,6]

DM can result in diabetes foot ulcer, blindness, renal failure, lower limb amputation, coronary artery disease, peripheral

vascular disease, stroke, and other long-term consequences that significantly impact the quality of life.^[7] Of these complications, diabetes-related foot problem affects the majority of patients with DM, yet, it is considered the most preventable one.^[8] Inappropriate footwear is the most common source of trauma which illustrates the importance of frequent examination of the feet in diabetic patients.^[9] Good knowledge and practice toward diabetic foot care reduce the risk of diabetic foot complications

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and ultimately amputation.^[10] According to the American Diabetes Association, annual assessments of knowledge and skills about diabetes foot care are necessary for patients with diabetes.^[11] An understanding of the causes of foot diseases in diabetics will enable high-risk patients to be recognized early.^[12] It has been estimated that up to 50% of the major amputations in diabetic patients can be prevented with effective education, though, not all diabetic foot disorders (DFUs) can be prevented, but the incidence of DFUs is higher among patients who do not practice proper diabetic foot care.^[12,13] It was reported that lack of knowledge and inadequate attention to foot care is common among patients with diabetes worldwide.^[13] They also found that the process of diabetic foot complications is highly relevant to the patient's capability to undertake diabetes foot self-care responsibilities; hence, patient education and motivation are crucial. Therefore, good patient knowledge and practices are significantly associated with a reduced risk of developing DFUs. Recently, the researchers observed with so much concern the rising number of patients previously managed for diabetes in the study institution, the University of Benin Teaching Hospital (UBTH), presenting for readmission on account of diabetic foot-related complications. This observation prompted the desire to embark on this study.

Materials and methods

This was a descriptive cross-sectional study conducted from January to February 2022. This was conducted among adult diabetic patients (18 years and above) attending the endocrine unit of the consultant outpatient departmental (COPD) clinics and wards (female and male medical, geriatric, and neurologic wards), University of Benin Teaching Hospital (UBTH), Benin City.

Sample size determination

A convenience sampling technique was employed to recruit patients who met the inclusion criteria. The sample size was determined using Taro Yamane's method of sample size calculation according to the formula, $n = \text{sample size}$, $e = \text{margin of error} = 0.05$, with a confidence level of 95%, with a sample size of 220. The inclusion criteria were known diabetic patients (male and female) attending the endocrine unit of the COPD clinics and on admission in the wards, aged between 18 and 60 years (because the study is designed to assess only adults), present during the period of data collection, and willing to participate in the study. However, patients with co-morbidities and others on critical care were excluded.

A self-structured questionnaire was developed. The questionnaire consisted of four sections: A–D. Section A: it contained 17 questions of both closed and open-ended questions that dealt with the sociodemographic characteristics of the respondents. Section B: it contained 18 questions that elicited responses to questions on knowledge of foot care. Section C: this section assessed the practice of foot care. It contained 11 questions on a 4-point Likert scale. Section D: this section assessed challenges regarding the practice of foot

care. The research instrument was pretested using split half, to ensure its reliability. This was subjected to the Cronbach alpha statistics with an index of 0.82, and this was considered high for the measure of internal consistency.

Method of data analysis

The questionnaires were screened for completeness by the researchers, and the data obtained were coded and analyzed using the SPSS statistical software version 21.00 (IBM Corp released 2012 Armonk, NY, USA: IBM Corp).

Ethical approval

The study was approved by the Institutional Ethical Committee of the UBTH on May 10, 2022, with reference number: ADM/E22/A/VOL.VII141735158.

Having obtained informed written consent from the eligible participants, the respondents were informed about the purpose and benefits of the study. The participants were also informed of their right to withdraw at any time without any consequences. Information provided by the participants during data collection was not divulged to others. Name or any form of identity was not required on the questionnaire to ensure confidentiality and anonymity, thus protecting the privacy of participants.

Results

Demographic characteristics of the patients

Table 1 shows that 112 (50.9%) respondents were 49–60 years, 54 (24.5%) were between 39–48 years, while 42 (19.1%) and 12 (5.5%) were between 29–38 years and 18–28 years, respectively. The mean \pm standard deviation age was 55.15 ± 5.25 . Males were more, 130 (59.1%), compared to females, 90 (40.9%). In terms of academic qualifications, 122 (55.4%) had secondary school qualification, 55 (25.0%) had a tertiary qualification, 23 (10.5%) had primary qualification, and 20 (9.1%) had no formal education. Eighty-four (38.2%) had an income of <N50,000, 75 (34.1%) had an income range between N50,000 and N100,000, and 61 (27.7%) had income above N100,000. Many, 146 (66.4%), of them reside in an urban setting, while 74 (33.6%) reside in a rural setting. Those with type 2 diabetes were more, 166 (75.5%), compared to 54 (24.5%) with type 1. A total of 111 (50.5%) patients had the condition for 6–10 years, 56 (25.5%) for over 10 years, and 53 (24.0%) for 5 years or less than this. One hundred and twenty (54.5%) had a family history of diabetes, while 100 (45.5%) had no family history of diabetes.

Knowledge of foot care among the patients

Table 2 shows that almost all the participants, 200 (90.9%), admitted that anti-diabetic medications should be taken regularly to prevent complications, 160 (72.7%) agreed that feet should be washed daily, 177 (78.5%) opined that lukewarm water should be used to wash feet, 210 (95.5%) admitted that temperature of the water should be checked before washing feet, and 128 (58.2%) believed that feet should be completely dried after washing. Only 96 (43.6%) admitted that talcum powder should be used to keep the areas between the toes dry,

Table 1: Demographic characteristics of the patients (n=220)

Variable	Frequency, n (%)
Age (years), mean±SD	55.15±5.25
18–28	12 (5.5)
29–38	42 (19.1)
39–48	54 (24.5)
49–60	112 (50.9)
Gender	
Male	130 (59.1)
Female	90 (40.9)
Highest level of education	
Primary	23 (10.5)
Secondary	122 (55.4)
Tertiary	55 (25.0)
None	20 (9.1)
Income (N)	
<50,000	84 (38.2)
50,000–100,000	75 (34.1)
>100,000	61 (27.7)
Place of residence	
Rural	74 (33.6)
Urban	146 (66.4)
Type of diabetes	
Type 1	54 (24.5)
Type 2	166 (75.5)
Duration of diabetes (years), mean±SD	7.62±5.25
0–5	53 (24.0)
6–10	111 (50.5)
>10	56 (25.5)
Family history of diabetes	
Yes	120 (54.5)
No	100 (45.5)
History of amputation	
Yes	22 (10.0)
No	198 (90.0)
Last time glucose value was measured	
Within the last 24 h	118 (53.6)
24 h–72 h	67 (30.5)
72 h–1 week ago	30 (13.6)
More	5 (2.3)
Treatment regimen	
Oral medications only	20 (9.1)
Insulin only	14 (6.4)
Oral medications + insulin	27 (12.3)
Combined diet + oral medications	65 (29.5)
Combined diet + insulin	49 (22.3)
Combined diet + oral medications + insulin	45 (20.4)
Other chronic conditions	
Yes	142 (64.5)
No	78 (35.5)
If yes, mention (n=142)	
Hypertension	64 (45.1)
Cardiac conditions	48 (33.8)
Renal conditions	14 (9.8)
Bone conditions	16 (11.3)

Contd...

Table 1: Contd...

Variable	Frequency, n (%)
Number of times admitted as a result of condition, mean±SD	3.71±2.411
<5	180 (18.8)
5–10	34 (15.5)
>10	6 (2.7)
Received foot care education	
Yes	165 (75.0)
No	55 (25.0)
If yes, from whom (n=165)	
Nurses	118 (71.5)
Doctors	47 (28.5)

SD: Standard deviation

154 (70.0%) agreed that lotions or moisturizing creams should be applied on the feet daily to prevent dryness of skin, and only 88 (40.0%) agreed that lotions should not be applied between the toes. One hundred and 44 patients (65.5%) admitted that socks should be changed every day, 198 (90.0%) agreed that toe nails should be trimmed straight across, 140 (63.6%) believed that feet should be inspected at least once a day, 106 (48.2%) agreed that patients with diabetes should wear comfortable shoes both inside and outside the house, 110 (50.0%) said that the inside of the shoes should be inspected before wearing them, 124 (56.4%) opined that patients with diabetes should not walk barefoot, 154 (70.0%) admitted that caring for the feet is important because patients with diabetes may not feel minor injuries on their feet, 188 (85.5%) agreed that caring for the feet is important because wounds and infections may not heal quickly in patients with diabetes, 160 (72.7%) agreed that patients should consult a doctor if their feet have redness, blisters, cuts, or wounds, and 122 (55.5%) opined that patients should not smoke because smoking causes poor circulation affecting the feet.

The practice of foot care among the respondents

Table 3 shows that 110 (50.0%) of the patients demonstrated good knowledge of foot care, while 73 (33.2%) and 37 (16.8%) of them demonstrated moderate and poor knowledge, respectively.

Chi-square analysis on the association between respondent's level of knowledge and practice of foot care

Since the computed Chi-square value $\chi^2 = 10.381$ at the degree of freedom (DF) 2 is greater than the critical value of 5.991 at 0.05 level of significance, there is statistically significant evidence to reject the null hypothesis. [Table 4] This means there is a statistically significant relationship ($P = 0.005$) between knowledge and practice of foot care among patients attending the UBTH, Benin City.

The challenge regarding the practice of foot care among the respondents

Table 5 shows that challenge(s) regarding the practice of foot care among the respondents include tiredness from doing

Table 2: Knowledge of foot care among the patients (n=220)

Items	Response	
	Yes, n (%)	No, n (%)
Anti-diabetic medications should be taken regularly to prevent complications	200 (90.9)	20 (9.1)
Feet should be washed daily	160 (72.7)	60 (27.3)
Lukewarm water should be used to wash feet	177 (78.5)	43 (21.5)
Temperature of the water should be checked before washing the feet	210 (95.5)	10 (4.5)
Feet should be completely dried after washing	128 (58.2)	92 (41.8)
Talcum powder should be used to keep the areas between the toes dry	96 (43.6)	124 (56.4)
Lotions or moisturizing creams should be applied on the feet daily to prevent dryness of skin	154 (70.0)	66 (30.0)
Lotions should not be applied between the toes	88 (40.0)	132 (60.0)
Socks should be changed every day	144 (65.5)	76 (34.5)
Toe nails should be trimmed straight across	198 (90.0)	22 (10.0)
Feet should be inspected at least once a day	140 (63.6)	70 (36.4)
Patients with diabetes should wear comfortable shoes both inside and outside the house	106 (48.2)	114 (51.8)
The inside of the shoes should be inspected before wearing them	110 (50.0)	110 (50.0)
Patients with diabetes should not walk barefoot	124 (56.4)	96 (43.6)
Caring for the feet is important because patients with diabetes may not feel minor injuries on their feet	154 (70.0)	66 (30.0)
Caring for the feet is important because wounds and infections may not heal quickly in patients with diabetes	188 (85.5)	32 (14.5)
Patients should consult a doctor if their feet have redness, blisters, cuts, or wounds	160 (72.7)	60 (27.3)
Patients should not smoke because smoking causes poor circulation affecting the feet	122 (55.5)	98 (44.5)

Table 3: Questionnaire and responses practice of foot care among the respondents (n=220)

Items	Response				Mean ±SD
	OFT, n (%)	SMT, n (%)	RL, n (%)	NV, n (%)	
Do you examine your feet?	54 (24.5)	57 (25.9)	69 (31.4)	40 (18.2)	2.57±1.051
Do you check your shoes before you put them on?	53 (24.1)	83 (37.7)	59 (26.8)	25 (11.4)	2.75±0.950
Do you check your shoes when you take them off?	59 (26.8)	42 (19.1)	65 (29.5)	54 (24.5)	2.48±1.133
Do you walk around the house barefoot?	66 (30.0)	65 (29.5)	68 (30.9)	21 (9.5)	2.80±0.977
Do you walk outside the house barefoot?	9 (4.1)	25 (11.4)	74 (33.6)	112 (50.9)	3.31±0.831
Do you wash your feet?	76 (34.5)	92 (41.8)	36 (16.4)	16 (7.3)	3.04±0.896
Do you check if your feet are dry after washing?	28 (12.7)	41 (18.6)	117 (53.2)	34 (15.5)	2.29±0.878
Do you dry between your toes?	57 (25.9)	36 (16.4)	81 (36.8)	46 (20.9)	2.47±1.091
Do you use moisturizing cream on your feet?	34 (15.5)	99 (45.0)	78 (35.5)	9 (4.1)	2.72±0.772
Do you put moisturizing cream between your toes?	24 (10.9)	69 (31.4)	108 (49.1)	19 (8.6)	2.45±0.801
Are your toe nails trimmed?	86 (39.1)	65 (29.5)	39 (17.7)	30 (13.6)	2.94±1.056
Grand mean					2.71±0.949

Mean cutoff: 2.5, OFT: Often, SMT: Sometimes, RL: Rarely, NV: Never, SD: Standard deviation

Table 4: Relationship between respondent's level of knowledge and practice of foot care using the Pearson Chi-square at 0.05 level of significance

Knowledge of DM	Practice of foot care		Total, n (%)	DF	χ^2	P
	Good, n (%)	Poor, n (%)				
Good	74 (67.3)	36 (32.7)	110 (100)	2	10.381	0.152**
Moderate	51 (69.9)	22 (30.1)	73 (100)			
Poor	15 (40.5)	22 (59.5)	37 (100)			
Total	140	80	220			

**Nonsignificant. DM: Diabetes mellitus, DF: Degree of freedom

the same thing repeatedly in 201 (91.4%), forgetfulness in 198 (90.0%), lack of family support in 159 (72.3%), lack of

caregiver in 148 (67.3%), and inadequate knowledge regarding foot care in 116 (52.7%).

The predictors of the development of foot ulcers among the patients

Table 6 shows that diabetic foot is more likely to occur among patients who are 29–38 years (adjusted odds ratio [AOR] = 1.373, $P = 0.731$, confidence interval [CI] = 0.225–8.367) and 49–60 years (AOR = 1.337, $P = 0.573$, CI = 0.488–3.663). Females are twice more likely to develop diabetic foot (DF) compared to males (AOR = 2.153, $P = 0.083$, CI = 0.905–5.120). Those without formal education have higher odds of developing DF (AOR = 0.902, $P = 0.892$, CI = 0.203–4.012). Those with higher income have higher odds of developing DF (AOR = 0.718, $P = 0.250$, CI = 0.250–2.060). Similarly, urban residents are more likely than rural dwellers to develop

Table 5: Challenge(s) regarding the practice of foot care among the respondents (n=220)

Items	Response		Remark
	Yes, n (%)	No, n (%)	
Financial constraints	108 (49.1)	112 (50.9)	Nonchallenge
Lack of caregiver	148 (67.3)	72 (32.7)	Challenge
Lack of family support	159 (72.3)	61 (27.7)	Challenge
Inadequate knowledge regarding foot care	116 (52.7)	104 (47.3)	Challenge
Forgetfulness	198 (90.0)	22 (10.0)	Challenge
Tired of doing the same thing repeatedly	201 (91.4)	19 (8.6)	Challenge
Development of foot ulcer	68 (30.9)	152 (69.0)	Nonchallenge
Noncontrol of condition	54 (24.5)	166 (75.5)	Nonchallenge
Development of neuropathy	98 (44.5)	122 (55.5)	Nonchallenge
Nonadherence to medication regimen	108 (49.1)	Nonchallenge	

DF (AOR = 1.687, $P = 0.248$, CI = 0.694–4.096). DF is more likely to occur among type 2 diabetic patients (AOR = 0.577, $P = 0.252$, CI = 0.225–1.478). Longer duration of diabetic illness (>10 years) has a higher odds of resulting in DF (AOR = 1.572, $P = 0.376$, CI = 0.577–4.278). Patients with a family history of diabetes are more likely to develop DF (AOR = 0.939, $P = 0.968$, CI = 0.425–2.206). An irregular blood glucose check is a higher risk of DF (AOR = 3.407, $P = 0.328$, CI = 0.292–39.710). While the last time, the glucose check within 24–72 hours carries twice the odds of developing of DF (AOR = 2.934, $P = 0.378$, CI = 0.045–7.626). Patients on insulin-only treatment regimen are more likely to develop DF (AOR = 1.197, $P = 0.858$, CI = 0.167–8.575), but patients on a combined diet + oral medications + insulin treatment regimen are at significantly lower risk of developing DF (AOR = 0.181, $P = 0.016$, CI = 0.045–0.728). Patients with a history of other chronic conditions are five times more likely to develop DF (AOR = 5.350, $P = 0.090$, CI = 0.771–37.119), and among patients with other chronic conditions, renal conditions significantly predict DF development (AOR = 0.115, $P = 0.036$, CI = 0.015–0.871). Patients with a history of 5–10 times hospitalization for diabetes-related diseases have higher odds of developing DF (AOR = 1.419, $P = 0.774$, CI = 0.131–15.403). It also shows that there is a higher odd of developing DF among patients who did not receive foot care education (AOR = 116.098, $P < 0.001$, CI = 12.497–1078.554), while those who received foot care education from nurses are less likely to develop DF (AOR = 0.022, $P = 0.001$, CI = 0.002–0.216).

Discussion

Knowledge of foot care

In this study, only half of the respondents demonstrated good knowledge of foot care. This finding is comparable to 50% and 51% reported by Sutariya and Kharadi in 2016 and Abu-Elenin *et al.* in 2018, respectively.^[14,15] However, it is at variance with the findings (58.8%) of Haq *et al.* in 2017, 61.3% reported by Tuha *et al.* in 2021, 81.3% reported by Alsaleh *et al.* in 2021, and 82.7% reported by Magbanua and Lim-Alba in 2017 but higher than 15.2% reported by Pourkazemi *et al.* in 2020.^[10,16-20]

The practice of foot care

In the present study, 63.6% of the respondents demonstrated good practice of foot care. This finding is comparable to 64.0% reported by Alsaleh *et al.* in 2021 but higher compared to the 50.4% reported by Pourkazemi *et al.* in 2020 from Guilan Province (north of Iran), 37.6% reported by Haq *et al.* in 2017, and 39.0% reported by Tuha *et al.* in 2021.^[10,16-20] The high foot care practice in the present study may be attributed to the role of health-care professionals in providing face-to-face health education programs on diabetic foot self-care during admission, including advice for diet, exercise and regular medication, and blood glucose checking. Communication between health-care providers and patients helps to improve the patients better. A thorough examination and detailed instructions for foot care from doctors and nurses can influence patients' self-examination along with proper care of their feet.

Challenges regarding the practice of foot care

The challenges regarding the practice of foot care identified in the present study included tiredness from doing the same thing repeatedly, forgetfulness, lack of family support, lack of caregivers, and inadequate knowledge regarding foot care. Some of these findings are consistent with what was reported by Seid and Tsige in 2015.^[20] In their study, they found that participants reported not knowing what to do and inconvenience for work as barriers to foot care.

Factors predict the development of foot ulcer

In the present study, a combined diabetic treatment regimen (combined diet + oral medications + insulin), history of renal conditions, not receiving foot care education, and receiving foot care education from nurses significantly predicted the development of diabetic foot ulcers. These findings are consistent with existing literature, like the study conducted in primary health-care centers in Kuwait by Alsaleh *et al.* in 2021.^[18] Patients who were using combination therapy with Oral Hypoglycaemic Agents [OHAs] and insulin had a higher risk of foot-related problems. A similar finding was reported in Egypt by Galal *et al.* in 2021.^[21] One of the cardinal symptoms of diabetes is polyuria, which means that the kidney must be efficient

Table 6: Predictors of the development of foot ulcer among the patients (personal history related) (n=220)

Variable	Diabetic foot ulcer		Total, n (%)	AOR	P	95%CI
	Yes, n (%)	No, n (%)				
Age (years)						
18–28	3 (25.0)	9 (75.0)	12 (100)	1		
29–38	14 (33.3)	28 (66.7)	42 (100)	1.373	0.731	0.225–8.367
39–48	16 (29.6)	38 (70.4)	54 (100)	0.871	0.788	0.318–2.386
49–60	35 (31.2)	77 (68.8)	112 (100)	1.337	0.573	0.488–3.663
Gender						
Male	36 (27.7)	94 (72.3)	130 (100)	1		0.905–5.120
Female	32 (35.6)	58 (64.4)	90 (100)	2.153	0.083	
Highest level of education						
Primary	7 (30.4)	16 (69.6)	23 (100)	1		
Secondary	38 (31.1)	84 (68.9)	122 (100)	0.374	0.291	0.060–2.323
Tertiary	17 (30.9)	38 (69.1)	55 (100)	0.702	0.62	0.173–2.847
None	6 (30.0)	14 (70.)	20 (100)	0.902	0.892	0.203–4.012
Income						
<N50,000	23 (27.4)	61 (72.6)	84 (100)	1		
N50,000–N100,000	25 (33.3)	50 (66.7)	75 (100)	0.699	0.246	0.246–1.982
>N100,000	20 (32.8)	41 (67.2)	61 (100)	0.718	0.25	0.250–2.060
Place of residence						
Rural	21 (28.4)	53 (71.6)	74 (100)	1		0.694–4.096
Urban	47 (32.2)	99 (67.8)	146 (100)	1.687	0.248	
Predictors of the development of foot ulcer among the patients (disease related) (n=220)						
Type of diabetes						
Type 1	17 (31.5)	37 (68.5)	54 (100)	1		
Type 2	51 (30.7)	115 (69.3)	166 (100)	0.577	0.252	0.225–1.478
Duration of diabetes (years)						
0–5	17 (32.1)	36 (67.9)	53 (100)	1		
6–10	34 (30.6)	77 (69.4)	111 (100)	0.905	0.862	0.293–2.797
>10	17 (30.4)	39 (69.6)	56 (100)	1.572	0.376	0.577–4.278
FamilyHistory of DM						
Yes	37 (30.8)	83 (69.2)	120 (100)	1		
No	31 (31.0)	69 (69.0)	100 (100)	0.939	0.968	0.425–2.206
Last time glucose was measured (h)						
Within the last 24 h	33 (28.0)	85 (72.0)	118 (100)	1		
24–7	19 (28.4)	48 (71.6)	67 (100)	2.934	0.378	0.045–7.626
72–1 week ago	13 (43.3)	17 (56.7)	30 (100)	3.407	0.328	0.292–39.710
More	3 (60.0)	2 (40.0)	5 (100)	0.586	0.683	0.269–32.037
Treatment regimen						
Oral medications only	4 (20.0)	16 (80.0)	20 (100)	1		
Insulin only	4 (28.6)	10 (71.4)	14 (100)	1.197	0.858	0.167–8.575
Oral medications + insulin	10 (37.0)	18 (63.0)	27 (100)	0.204	0.085	0.033–1.242
Combined diet + oral medications	20 (30.8)	45 (69.2)	65 (100)	0.266	0.087	0.058–1.211
Combined diet + insulin	21 (42.9)	27 (57.1)	49 (100)	0.421	0.180	0.119–1.491
Combined diet + oral medications + insulin	9 (20.0)	36 (80.0)	45 (100)	0.181	0.016	0.045–.728
Other chronic conditions						
Yes	45 (31.7)	97 (68.3)	142 (100)	1		
No	23 (29.5)	55 (70.5)	78 (100)	5.350	0.090	0.771–37.119
If yes, mention (n=142)						
Hypertension	21 (32.8)	43 (67.2)	64 (100)	1		
Cardiac conditions	18 (37.5)	30 (62.5)	48 (100)	0.234	0.141	0.034–1.618
Renal conditions	3 (21.4)	11 (78.6)	14 (100)	0.115	0.036	0.015–0.871
Bone conditions	3 (18.8)	13 (81.3)	16 (100)	0.330	0.372	0.029–3.751
Number of admissions on condition						

Contd...

Table 6: Contd...

Variable	Diabetic foot ulcer		Total, n (%)	AOR	P	95%CI
	Yes, n (%)	No, n (%)				
Predictors of the development of foot ulcer among the patients (disease related) (n=220)						
<5	55 (30.5)	125 (69.4)	180 (100)	1		
5–10	11 (32.4)	23 (67.6)	34 (100)	1.419	0.774	0.131–15.403
>10	2 (33.3)	4 (66.7)	6 (100)	1.074	0.956	0.084–13.780
Received foot care education						
Yes	42 (25.5)	123 (74.5)	165 (100)	1		
No	26 (47.3)	29 (52.7)	55 (100)	116.098	0	12.497–1078.554
If yes, from whom (n=165)						
Nurses	39 (33.1)	79 (66.9)	118 (100)	1		
Doctors	15 (31.9)	32 (68.1)	47 (100)	0.022	0.001	0.002–0.216

CI: Confidence interval, DM: Diabetes mellitus, AOR: Adjusted odds ratio

to be able to consistently perform this role. Where the functional ability of the kidney is compromised, there would be retention of excess fluid which could account for a higher risk of developing diabetic foot.

The key to the prevention of diabetic foot problems is education. The International Working Group on the diabetic foot strongly recommended education on footwear and encouraged education for foot care.^[5] Hence, it is not surprising that lack of receiving foot care education predicts higher risk. However, while foot care education is mainly directed at patients and caregivers, professionals must first be educated so that they understand the nature of patient education. This finding indicates an ineffective foot care teaching approach from the nurses which must be addressed through training and retraining.

Implication for nursing practice

Proper education about diabetes is one primary treatment approach and preventive measure. It has been opined that enhancing public knowledge about a health threat is a fundamental first step in informing discussions that promote behavior change across multiple determinants of health and aligning health policies with general public health interests.^[22] The finding from this study suggested that diabetic foot care education should be included in the long-term management plan of diabetic patients. The important objectives of diabetes management education are empowering and having autonomy, stressing the psychological and social part of the disease, open dialogue, and communication that is active, improving and learning new practical skills, rendering support and discussing the distress of the client as well as sharing more information that is connected to the patients' experience. The nurses' role is very crucial in the prevention of diabetic foot ulcers and other related complications in at-risk groups. Nurses should be steady in conveying information as well as giving feedback to the patient and family as an educator and health promoters. However, the finding from this study indicates an ineffective foot care teaching approach from the nurses which must be addressed through training and retraining.

Conclusion

There is good knowledge, but the practice level of foot care among the respondents of type 2 and 1 diabetic patients is still below the standard. Therefore, there is a need for adequate education of people with diabetes and their families as well as health professionals, especially nurses. Following the outcomes of the study, the considerations and implications drawn from it, the following recommendations were made;

- Efforts are needed to increase awareness and improve communication about diabetes risk factors, familial risk, and risk reduction behaviors within families with a family history of diabetes
- Identification of family members who can facilitate communication, education, and modeling of healthy behaviors may increase awareness and motivate at-risk individuals to engage in risk-reducing behaviors
- Diabetic patient's close family members should be included in long-term management plans of diabetic patients by health-care professionals.

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Conflicts of interest

There are no conflicts of interest.

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हिन्दी सारांश

बेनिन शहर में बेनिन विश्वविद्यालय शिक्षण अस्पताल में भाग लेने वाले मधुमेह के मरीजों में पैरों की देखभाल का ज्ञान, अभ्यास और चुनौतियां: एक क्रॉस-अनुभागीय अध्ययन
रोज़मेरी नोज़ी ओसुंडे, ओलाओलोरुनपो ओलोरुनफ़ेमी

पृष्ठभूमि: पैर का अल्सर मधुमेह का एक सामान्य उपद्रव है और मधुमेह की प्रगति का सबसे घातक उपद्रव है, जो उच्च रुग्णता और मृत्यु दर से जुड़ा है। **उद्देश्य:** मधुमेह (डी एम) रोगियों में पैरों की देखभाल के ज्ञान, अभ्यास और चुनौतियों का आंकलन करना। **सामाग्री एवं विधि:** इस विवरणात्मक क्रॉस-अनुभागीय अध्ययन को बेनिन विश्वविद्यालय के टीचिंग हॉस्पिटल, बेनिन शहर में भाग लेने वाले मधुमेह के टाइप I और टाइप II रोगियों के बीच पैरों की देखभाल के ज्ञान और अभ्यास का आंकलन किया गया। डेटा संग्रह का उपकरण 0.880 की विश्वसनीयता के साथ एक संरचित प्रश्नावली थी। डेटा का विश्लेषण करने के लिए SPSS संस्करण 22 का उपयोग किया गया था। **परिणाम:** परिणामों से पता चला कि पैरों की देखभाल के बारे में 110 (50.0%) अच्छा ज्ञान है, जबकि उसका अभ्यास कम पाया गया। यह उस कारक को भी दर्शाता है जो सांख्यिकीय रूप से पैर के अल्सर के वृद्धि का पूर्वानुमान करता है जिसमें संयुक्त आहार + मौखिक दवाएं + इंसुलिन उपचार आहार (एओआर = 0.181, पी = 0.016, सीआई = 0.045-.728), वृक्क विकार का इतिहास (एओआर = 0.115) शामिल है। पी = 0.036, सीआई = 0.015-.871), पैरों की देखभाल की शिक्षा प्राप्त नहीं करना (एओआर = 116.098, पी < 0.001, सीआई = 12.497-1078.554) और नर्सों से पैरों की देखभाल की शिक्षा प्राप्त करना (एओआर = 0.022, पी = 0.001, सीआई = 0.002-.216)। इसके अलावा, पैरों की देखभाल के अभ्यास के संबंध में चुनौतियां बार-बार एक ही काम करने से होने वाली थकान 201(91.4%) और भूलने की बीमारी 198(90.0%) थीं। **निष्कर्ष:** नर्सों और अन्य स्वास्थ्य देखभाल प्रबंधकों को अपनी भविष्य की देखभाल योजना में मधुमेह में पैर देखभाल के अभ्यास के संबंध में पहचाने गए पूर्वानुमानित कारकों और चुनौतियों पर विचार करने की आवश्यकता है।

मुख्य शब्द: अभ्यास, नाइजीरिया, मधुमेह में पैर की देखभाल की चुनौतियाँ, ज्ञान