

Research Article

Knowledge, Practice, and Barriers of Foot Care among Diabetic Patients Attending Felege Hiwot Referral Hospital, Bahir Dar, Northwest Ethiopia

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Introduction. Diabetes mellitus is a chronic debilitating condition characterized by an increased blood glucose level and is associated with significant morbidity, mortality, and increasing health care cost. Diabetic foot ulcers and lower extremity amputations are a common, complex, costly, and disabling complication of diabetes. An estimated 15% of patients with diabetes develop a lower extremity ulcer. **Objective.** The aim of this study was to assess knowledge, practice, and barriers of diabetic foot self-care among diabetic patients attending Felege Hiwot Referral Hospital. **Method.** Institution based descriptive cross-sectional study was conducted on 313 diabetic patients using convenient sampling technique. Furthermore, descriptive statistics and binary and multivariate logistic regression were employed to assess the predictors of knowledge and practice of diabetic foot care. **Result.** Majority of respondents were males (64.9%). The mean age was 39.1 ± 16 . The mean knowledge score was 7.5 ± 2.02 of which 56.2% and 43.8% had good and poor knowledge of foot care, respectively. The mean practice score was 25.2 ± 6.466 of which 53.0% had good and the remaining 47.0% had poor foot care practice. Of 162 respondents having barriers, 56.8% reported “poor communication between patients and health care providers,” 50.6% cited “I did not know what to do,” and 44.4% responded “inconveniency for work” as barriers of foot care. **Conclusion and Recommendation.** Knowledge and practice of foot care of diabetic patients are still substandard. Poor communication between patients and nurses/physicians, lack of adequate knowledge, and inconveniency for work were commonly cited barriers of foot care. Policy makers should initiate interventional foot care education program throughout the regional state. The study hospital should consider establishing a specialized diabetic clinic in which foot care education can easily be integrated into follow-up care.

1. Introduction

Diabetic foot ulcer (DFU) is a full-thickness wound penetrating through the dermis (the deep vascular and collagenous inner layer of the skin) located below the ankle in a diabetes patient. If a foot ulcer goes untreated and does not heal, it may become infected [1].

DFU was found to affect 10–15% of diabetics. It occurs as a result of many risk factors which include long duration of diabetes, poor metabolic control, foot deformities, older age, and peripheral vasculopathy and poor knowledge of diabetics [2].

It is estimated that about 5% of all patients with diabetes present with a history of foot ulceration, while the lifetime risk of diabetic patients developing this complication is 15%.

The majority (60–80%) of foot ulcers will heal, while 10–15% of them will remain active, and 5–24% of them will finally lead to limb amputation within a period of 6–18 months after the first evaluation [3].

As to the complication, more than 60% of nontraumatic lower extremity amputation (LEA) in the United States occurs among people with diabetes, in whom the rate is 6 to 10 times higher than among people without diabetes. After a first LEA, up to 50% of patients require another amputation within 3–5 years. Furthermore, the 5-year mortality after LEA is approximately 50%, with the risk considerably higher for diabetic compared with nondiabetic patients [4].

A review of the epidemiology of diabetic foot problems in Africa highlighted not only the frequency of neuropathy but

also the increasing frequency of peripheral vascular disease, presumably a result of increasing urbanization and additional factors like unhygienic conditions, poverty, frequent coexisting HIV infection, barefoot gait, low income, and cultural practices were also evident as a risk factor for diabetic foot ulcer [5].

Beside the direct costs of foot complications, there are also indirect costs relating to loss of productivity, individual patients and family costs, and loss of health related quality of life. The lifetime risk of a person with diabetes developing a foot ulcer could be as high as 25%, and it is believed that every 30 seconds a lower limb is lost somewhere in the world as a consequence of diabetes [6].

An understanding of the causes of foot diseases in diabetics will enable high-risk patients to be recognized early. It has been estimated that up to 50% of the major amputations in diabetic patients can be prevented with effective education. A potentially preventable initiating event was identified in 86%, most often minor trauma that caused cutaneous injury. Inappropriate footwear is the most common source of trauma which illustrates the importance of frequent examination of the feet in diabetic patients [7].

A study in Sri Lanka indicated that more than 50% of the study sample had knowledge on diabetic foot care principles but practice is substandard. Among all diabetic foot care principles, only regular foot observation was carried out by 65.5%. The practice of other foot care principles was below 50%. Finally, this study found that diabetic foot problem is mainly concentrated on elderly population and importance of regular screening of patients with diabetes [8].

A study on veterans demonstrated that more than 50% of respondents reported that they "know enough" in only the following three categories: "check feet regularly," "keep feet clean," and "wearing shoes always" [9].

Another study conducted in Saudi Arabia revealed that more than half of the diabetics checked their feet regularly, while 47% did not. In this study, about half the diabetics (47%) did not check on their feet at all, less than one-fifth (19%) checked their feet daily, and 18% walked barefooted [10].

A study conducted at Dr. Yusuf Dadoo district hospital of Johannesburg showed that more than 75% of the patients had no knowledge of foot care and 28.3% had not cared for their feet personally when asked. Although 71.7% of participants reported that they had cared for their own feet, only 32.5% had had their feet examined by a doctor or nurse and 5.8% by a podiatrist. Another study in Nigeria indicated that, of the total DM patients, 30.1% had good knowledge of diabetic foot care, 23.9% had satisfactory score, and 46.0% had poor knowledge of diabetic foot care. Moreover, only 10.2% had good practice of diabetic foot care, 40.3% had satisfactory score, and 49.4% had a poor practice of diabetic foot care. It also determined that poor knowledge is the major contributing factor for poor practice of foot care. In this study, lack of knowledge of foot care was reported by 33.0%, 5.7% cited poverty, and 2.6% cited poor communication between patients and their physician as barriers of foot care [7, 11].

Diabetes mellitus is emerging as one of the major chronic health problems in Ethiopia. A study conducted in Tikur

Anbessa General Specialized Hospital concluded that lack of regular patient follow-up and diabetes education on foot care, poor glycemic control, delay in patient presentation, and surgical intervention as well as patients' refusal to undergo surgical interventions were the reported contributing factors for the observed high mortality due to diabetes mellitus [12, 13].

Generally, the adverse effects of DFU include high financial burden, foot amputation, physical disability, low quality of life, and a high mortality rate and long term treatment of DFUs is difficult; ulcers often reoccur even after healing; all the above factors insist that prevention of DFU is absolutely essential.

Beside the absence of study conducted in the study area even in the country at large, the investigator noticed that communities in the study area were walking barefoot. Again from the previous studies done elsewhere in Ethiopia, foot care checking was the main aspect of diabetes care ignored by most of the treating practitioners. Thus, the investigators were motivated to assess knowledge, practice, and barriers of foot care among diabetic patients attending Felege Hiwot Referral Hospital to contribute in the efforts made in delivering quality services and control devastating outcomes.

2. Methods

Institution based descriptive cross-sectional study was conducted from March 1 to April 1, 2014. A total sample of 313 diabetic patients was recruited from both inpatient and outpatient medical department using convenient sampling technique. Study participants were consecutively interviewed till final sample size was reached.

The study was conducted at Felege Hiwot Referral Hospital found in Bahir Dar which is the capital city of Amhara regional state located at 565 kms from Addis Ababa, to Northwest Ethiopia. It is a tertiary health care level hospital serving the population of Bahir Dar town and remote areas of northwest Ethiopia. The total population served by the hospital is about 12 million.

The sample size was determined using a single population proportion sample size estimation method by assuming that the prevalence of knowledge of foot care is 50% (to obtain the maximum representative sample size since no similar study was found in the area) with 95% confidence interval. Finally, we calculated 313 patients using population correction formula.

The knowledge questionnaire is adapted from similar study conducted before and from diabetic foot care education recommended by American College of Foot and Ankle Surgeons.

On the other hand, diabetic foot self-care practice questionnaire is adopted from validated instrument of Nottingham Assessment of Functional Foot Care (NAFFC) [14]. Responses to questions were recorded on a categorical scale (scored 0–3) according to the frequency of occurrence of the behavior. Pretest was conducted on 10% of total sample size and adjustment which was made based on the result. Even though NAFFC consists of 29 independent questions, this study used only 16 items. This is due to the fact that

participants in study area have different socioeconomic status and the rest of questions are inappropriate to accurately measure the intended behavior and were discarded after the pretest.

On the other hand, barriers of foot self-care questions are adapted from previous qualitative and quantitative studies. Finally, the overall tool was translated to Amharic (local) language to make it easy for study participants and data collectors and back translated to English language by another person to check its semantic equivalence.

Epi Info version 3.5.4 and SPSS version 20 were used for data entry, cleaning, and analysis. The results are presented by employing frequency tables, percentages, means, odds ratio, and 95% confidence limit. *P* values will be reported as statistically significant if <0.05 or 5%. Moreover, to determine the association between variables, correlation, chi-square, bivariate, and multivariate logistic regression analysis were used as necessary.

2.1. Operational Definitions

- (1) *Good Knowledge of Foot Care*. This included participants who score mean or above on knowledge questions.
- (2) *Poor Knowledge of Foot Care*. This included participants who score below the mean on knowledge questions.
- (3) *Good Foot Care Practice*. This included a total practice score of $\geq 50\%$ of maximum score.
- (4) *Poor Foot Care Practice*. This included a total practice score of $<50\%$ of maximum score.

Ethical clearance was obtained from Institutional Review Board (IRB) of Addis Ababa University, Department of Nursing and Midwifery. In addition, informed consent was obtained from study participants and the right to refuse or terminate at any point of the interview was assured.

3. Result

A total of 313 diabetes patients were involved in the study with the response rate of 100% as consecutive respondents were recruited until sample size was reached and they did not have problems with participating in the study.

3.1. Sociodemographic Characteristics. Among the total of 313 respondents, 203 (64.9%) and 110 (35.1%) were males and females, respectively. The mean age was $39.1 (\text{SD} \pm 16.1)$ years and majority of the patients 88 (28.1%) lie between 18 and 25 years. More than half of the participants 196 (62.6%) were married and almost all 310 (99%) were Amhara.

Regarding the religion of respondents, the majority were Orthodox followed by Muslims which accounts for 287 (91.7%) and 20 (6.4%), respectively. The result on educational status showed that a large proportion of participants 103 (32.9%) were illiterate followed by grades 1–8th which accounts for 71 (22.7%). As to the occupational status of

TABLE 1: Sociodemographic characteristics of diabetic patients following in Felege Hiwot Referral Hospital, Bahir Dar, 2014.

Variables	Frequency (%)
Age (year)	
18–25	88 (28.1)
26–35	59 (18.8)
36–45	60 (19.2)
46–55	55 (17.6)
>55	51 (16.3)
Sex	
Male	203 (64.9)
Female	110 (35.1)
Ethnicity	
Amhara	310 (99.0)
Tigray	2 (0.6)
Gurage	1 (0.3)
Marital status	
Married	196 (62.6)
Single	81 (25.9)
Divorced	23 (7.3)
Widowed	10 (3.2)
Separated	3 (1.0)
Religion	
Orthodox	287 (91.7)
Muslim	20 (6.4)
Protestant	6 (1.9)
Educational status	
Illiterate	103 (32.9)
Can read and write	37 (11.8)
Grades 1–8th	71 (22.7)
Grades 9–12th	54 (17.3)
College and above	48 (15.3)
Occupational status	
Farmer	125 (39.9)
Merchant	16 (5.1)
Government employee	72 (23.0)
NGO employee	16 (5.1)
Daily laborer	23 (7.3)
Housewife	50 (16.0)
Student	11 (3.5)
Monthly income (Ethiopian birr) ($\$ = 19.00$ birr)	
≤ 500 (\$26)	71 (22.7)
501–1000 (\$26–52)	124 (39.6)
>1000 (\$53)	118 (37.7)

respondents, the majority of them 125 (39.9%) were farmers, 72 (23.0%) were government employees, and the least 11 (3.5%) were high school and university students. Furthermore, substantial proportion 124 (39.6%) reported as they get an average estimated monthly income of 501–1000 and 118 (37.7%) get above 1000 Ethiopian birr (Table 1).

3.2. Clinical and Residence of Study Participants. Regarding the clinical history of 313 study participants, 263 (84.0%)

TABLE 2: Distribution of patients' response to questions related to the knowledge of diabetic foot self-care in Felege Hiwot Referral Hospital, Bahir Dar, 2014.

Knowledge questions	Do know Freq. (%)	Do not know Freq. (%)
DM patients should take medication regularly because they are liable to get DM complication.	307 (98.1)	6 (1.9)
DM patients should look after their feet because they may not feel a minor injury to their feet.	222 (70.9)	91 (29.1)
DM patients should look after their feet because wounds and infection may not heal quickly.	257 (82.1)	56 (17.9)
DM patients should look after their feet because they may get a foot ulcer.	244 (78.0)	69 (22.0)
DM patients should not smoke because smoking causes poor circulation and affects the feet.	63 (20.1)	250 (79.9)
How often do you think you should inspect your feet?	212 (67.7)	101 (32.3)
If you found redness/bleeding between your toes what is the first thing you do?	233 (74.4)	80 (25.6)
How often do you think your feet should be washed?	292 (93.3)	21 (6.7)
What temperature of water do you think you should wash your feet in?	81 (25.9)	232 (74.1)
How often do you think you should inspect the inside of your footwear for objects or torn lining?	213 (68.1)	100 (31.9)
How often do you think you should wear shoes and socks?	225 (71.9)	88 (28.1)

have never heard information about diabetic foot self-care principles before. Likewise, the majority of the respondents 193 (61.7%) did not have any history of foot problems after diagnosis of DM whereas the remaining 120 (38.3%) had history of foot ulcer ranges from as simple as superficial laceration to deep wound infection that required amputation.

As to the care by health professionals, 231 (73.8%) reported that their feet were not examined by nurses or physicians during their follow-up. Furthermore, more than half 178 (56.9%) of the study participants reside in urban areas.

Apart from knowledge of principles of diabetic foot self-care, the majority of the patients 249 (79.6%) did not know the type of diabetes they are suffering.

The finding on durations of therapy shows that the minimum and maximum duration of diabetic therapy are 4 months and 26 years, respectively. Again, the majority of the respondents 185 (59.1%) live with diabetes for lower than 5 years followed by 5–10 years which accounts for 95 (30.4%).

3.3. Knowledge of Study Participants towards Principles of Diabetic Foot Care. The mean knowledge score was 7.5 ± 2.02 . The range of knowledge score obtained in this study was 1–11 out of maximum possible score of 11. On classifying the knowledge score of the study participants, 176 (56.2%) had good knowledge and 43.8% had poor knowledge of diabetic foot care.

Two hundred fifty (79.9%) of DM patients were unaware that smoking causes poor circulation to the feet and similarly 232 (74.1%) of respondents were unaware of the level of temperature of water that should be used to wash feet. On the other hand, 307 (98.1%) of participants had knowledge that DM complication could happen if medications are not taken regularly. Likewise, 300 (95.8%) of the respondents were aware about frequency that diabetic patients should wash their feet (Table 2).

3.4. Diabetic Foot Self-Care Practices. After 16 out of 29 items were selected from Nottingham Assessment of Functional

Foot Care (NAFFC) and translated to Amharic (local) language, the mean practice score is found to be 25.2 ± 6.466 and the minimum and maximum score out of 54 were 6 and 41, respectively. Each foot care practice had four options with assigned values ranges from 0 to 3.

Regarding the overall diabetic foot self-care practice of study participants 171 (54.6%) had good foot care practice ($\geq 50\%$) and 142 (45.4%) had poor foot care practice ($< 50\%$).

The study revealed that the majority of the respondents (41.2%) inspect their feet daily and (38.7%) have *never* checked their shoes before they put them on. Again the majority of the respondents (45.7%) have never checked their shoes when they take them off (Table 3).

As to the frequency of washing of feet, almost half of the respondents (49.5%) wash their feet more than once a day followed by once a day which accounts for 44.1%. Regarding the practice of drying feet after washing, of the total respondents, 59.1% and 69.3% never had a habit of drying their feet and between toes, respectively.

Concerning the use of moisturizing cream on feet, the majority 72.5% never used cream and 14.4% used it once on a week basis. The majority of study participants (79.2%) have never used cream to moisten the space between toes but 11.2% apply it once per week. Trimming of toenails is another practice of foot care in which the majority 66.5% cut toenails about once a month followed by 21.1% who cut toenails less than once a month.

The study also showed that the majority 44.1% wear sandals most time of the day and only 14.7% of participants have never worn open sandals. On the other hand, 55% did not practice wearing of shoes without socks but there are also patients who often wear shoes without socks which accounts for 21.7% of total participants. Additionally, the majority of respondents 75.4% change socks less frequently (i.e., less than 4 times a week) followed by 4–6 times a week which accounts for 21.4%.

Another finding on practice of walking barefoot shows that 73.5% and 82.7% of respondents have never walked around and outside the house, respectively. Although the majority of study participants have never walked barefoot,

TABLE 3: Frequency distribution of participants' response to inspection of feet, checking shoes before they put them on and during taking them off, Felege Hiwot Referral Hospital, Bahir Dar, 2014.

Practice question		Frequency	Percent
Do you examine/inspect your feet?	More than once a day	61	19.5
	Once a day	129	41.2
	4–6 times a week	10	3.2
	Once a week or less	113	36.1
Do you check your shoes before you put them on?	Often	101	32.3
	Sometimes	49	15.7
	Rarely	42	13.4
	Never	121	38.7
Do you check your shoes when you take them off?	Often	91	29.1
	Sometimes	46	14.7
	Rarely	33	10.5
	Never	143	45.7

TABLE 4: Frequency distribution of participants' response to walking barefoot in and outside the house, Felege Hiwot Referral Hospital, Bahir Dar, 2014.

Practice question		Frequency	Percent
Do you walk in the house barefoot?	Often	27	8.6
	Sometimes	21	6.7
	Rarely	35	11.2
	Never	230	73.5
Do you walk outside barefoot?	Often	15	4.8
	Sometimes	15	4.8
	Rarely	24	7.7
	Never	259	82.7

still 15.3% frequently walk barefoot while 9.6% walk barefoot outside the home (Table 4).

Regarding the habit of putting feet near the fire, majority of the respondents 84.7% have never put their feet near the fire followed by 11.2% who rarely practice the behavior.

Lastly, 75.7% of the participants never apply dressing when their feet is exposed to blisters, cut, or burn when they exposed but 13.1% often practice it well.

3.5. Barriers of Diabetic Foot Care. When study participants were asked whether they encounter barriers that limit them from proper foot care, 52% and 48% responded "yes" and "no," respectively.

As to the barriers of proper foot self-care practices, from the total of 162 respondents who had encountered barriers, 92 (56.8%) reported "poor communication between patients and health care providers," 82 (50.6%) cited "I did not know what to do," and 72 (44.4%) responded "inconveniency for work" are the major barriers frequently mentioned (Figure 1).

3.6. Factors Affecting Knowledge of Diabetic Foot Care. All sociodemographic characteristics are tested with the categorized knowledge score of foot care using a binomial logistic regression (COR). The result shows that knowledge of diabetic foot care is significantly associated ($P < 0.05$) with educational status, monthly income, duration of diabetic therapy, and place of residence. For instance, participants

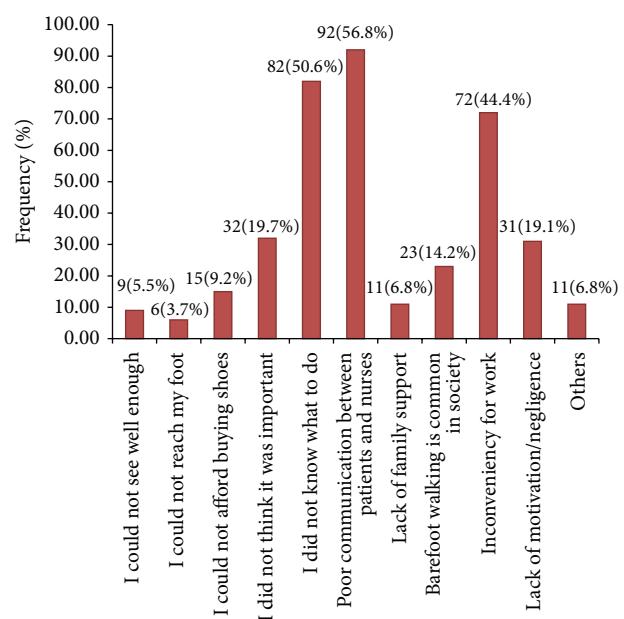


FIGURE 1: Frequency distribution of participants perceived barriers of diabetic foot care practice, Felege Hiwot Referral Hospital, Bahir Dar, 2014.

with educational status college and above are 2.12 times more likely to have good knowledge as compared to illiterates (COR = 2.120 (1.038–4.328), $P = 0.039$). Similarly,

TABLE 5: Factors affecting knowledge of diabetic patients about foot care, Felege Hiwot Referral Hospital, Bahir Dar, 2014.

Variable	Knowledge of foot care	
	AOR (95% CI)	P value
Age		
15–25	1.0	—
26–35	1.944 (0.788–4.794)	0.149
36–45	0.907 (0.352–2.333)	0.839
46–55	1.758 (0.614–5.301)	0.293
>55	0.638 (0.204–1.993)	0.439
Marital status		
Married	1.0	—
Single	0.426 (0.199–0.913)	0.028*
Divorced	0.556 (0.211–1.468)	0.236
Widowed	3.983 (0.826–19.206)	0.085
Separated	1.383 (0.095–20.124)	0.812
Educational status		
Illiterate	1.0	—
Can read and write	0.543 (0.230–1.281)	0.163
Grades 1–8th	1.989 (0.951–4.163)	0.068
Grades 9–12th	1.782 (0.701–4.527)	0.225
College and above	1.318 (0.428–4.060)	0.631
Occupational status		
Farmer		
Merchant	1.070 (0.221–5.176)	0.933
Government employee	1.060 (0.290–3.873)	0.930
NGO employee	0.821 (0.156–4.325)	0.816
Daily laborer	0.641 (0.184–2.236)	0.485
Housewife	0.320 (0.097–1.062)	0.063
Student	0.825 (0.146–4.652)	0.827
Monthly income (b)		
<500	1.0	—
501–1000	1.507 (0.744–3.049)	0.255
>1000	1.130 (0.502–2.541)	0.768
Place of residence		
Urban		
Rural	0.489 (0.189–1.267)	0.141
Duration of DM (yr)		
<5	1.0	—
5–10	1.298 (0.740–2.277)	0.363
>10	2.195 (0.827–5.830)	0.115

*Have significant association at P value less than 5%.

participants who are on diabetic therapy for more than 10 years are 2.84 times more knowledgeable as compared to those on diabetic therapy for less than 5-year duration (COR = 2.835 (1.216–6.612), $P = 0.016$).

On the other hand, when possible confounders are controlled using multivariate logistic regression, participants whose marital status is single are 0.426 times less likely to have good knowledge as compared to married respondents (AOR = 0.426 (0.199–0.913), $P = 0.028$) (Table 5).

3.7. Factors Affecting Diabetic Foot Care Practice. Among the sociodemographic characteristics, a bivariate logistic regression statistic showed that there is an association between

participants' age, educational status, and occupational status with the practice of foot self-care. With respect to the clinical characteristics, place of residence, duration of antidiabetic therapy, and knowledge status of foot care were associated with the practice of foot self-care.

Multivariate logistic regression analysis showed that participants whose educational status is of grades 9–12th are 2.968 (AOR = 2.969 (1.045–8.431), $P = 0.041$) times more likely to practice diabetic foot care as compared to illiterates.

On the other hand, participants whose occupation is government employee are 5.63 times (AOR = 5.629 (1.408–22.497), $P = 0.015$) more likely to practice foot care as compared to farmers.

Similarly, when knowledge score of diabetic foot care principles was summed and categorized dichotomously, participants who had good knowledge of foot care are 4.84 times (AOR = 4.839 (2.769–8.457), $P = 0.000$) more likely to practice foot care as compared to poorly knowledgeable participants (Table 6).

4. Discussion

Diabetic foot ulcer is one of the chronic complications of DM in which patients end up with disability and death if it is not effectively prevented and controlled.

In this study, out of 313 study subjects, the majority 28.1% of respondents' ages were between 18 and 25 years category. This may be due to the fact that type 1 DM patients are younger and have poly symptoms that insist to seek medical care as compared to type 2 patients who are elder and asymptomatic which results poor medical seeking behavior.

Regarding the occupational status, 39.9% of study participants were farmers. This result awakes policy makers and researchers because it is known that in Ethiopia most farmers reside in rural areas and are assumed to be in challenge of communicable diseases instead of chronic diseases like DM. Therefore, it gives a clue to the prospect that the prevalence of chronic diseases is increasing in rural communities.

The study result on knowledge of principles of diabetic foot self-care indicates that the mean knowledge score was 7.5 ± 2.02 . This score is higher than that of a study done in Nigeria in which the score was $5.8\% \pm 3.3$ but nearly comparable to the study done in Sri Lanka which was 8.3. The difference may be attributed to majority of respondents are members of Ethiopian Diabetic Association in which they periodically meet and update with recent information related to DM including foot care. Again, public mass media are now preparing discussion with health care professionals to deliver information related to the DM.

Furthermore, it is showed that 56.2% had good knowledge and 43.8% had poor knowledge of diabetic foot self-care. This result is consistent with the study done in Nigeria that 46% were poorly knowledgeable about foot care principles but slightly lower than South Africa which is 75% [7, 12].

This study revealed that age, educational status, marital status, and duration of diabetic therapy were associated with knowledge of foot care. Thus, the probability of having good knowledge is higher among individuals who stay in DM

TABLE 6: Factors affecting foot care practice of diabetic patients, Felege Hiwot Referral Hospital, Bahir Dar, 2014.

Variable	Foot care practice	
	AOR (95% CI)	P value
Age		
18–25	1.0	—
26–35	1.327 (0.546–3.224)	0.532
36–45	2.430 (0.977–6.042)	0.056
46–55	2.116 (0.774–5.787)	0.144
>55	2.116 (0.678–6.600)	0.197
Educational status		
Illiterate	1.0	—
Read and write	1.159 (0.474–2.831)	0.746
Grades 1–8th	2.683 (1.224–5.883)	0.014*
Grades 9–12th	2.969 (1.045–8.431)	0.041*
College/above	2.250 (0.642–7.883)	0.205
Occupational status		
Farmer	1.0	—
Merchant	2.598 (0.526–12.822)	0.241
Government employee	5.629 (1.408–22.497)	0.015*
NGO employee	3.957 (0.755–20.731)	0.104
Daily laborer	5.547 (1.455–21.151)	0.012*
Housewife	2.611 (0.818–8.341)	0.105
Student	3.526 (0.560–22.192)	0.179
Monthly income		
<500	1.0	—
500–1000	0.744 (0.342–1.622)	0.458
>1000	0.487 (1.95–1.219)	0.124
Place of residence		
Urban	1.0	—
Rural	1.528	0.641
Duration of DM		
<5 years	1.0	—
5–10 years	1.582 (0.865–2.894)	0.137
>10 years	1.272 (0.457–3.536)	0.645
Knowledge status		
Good	4.839 (2.769–8.457)	0.000*
Poor	1.0	

* Have significant association at P value less than 5%.

therapy for long period of time. Previous findings conducted in Harar also revealed similar result.

The mean practice score was 25.2 ± 6.466 which is around half percent of a full score and shows having good practice in general. Regarding the overall diabetic foot self-care practice of study participants 171 (54.6%) had good foot care practice (>50%) and 142 (45.4%) had poor foot care practice (<50%). Previous finding on Sri Lanka showed that from cumulative percentages 47.3% has scored below the half while the rest 52.7% has scored above half of given questions which was consistent to this study. However, it is contrasted to the study

in Nigeria. The results may be attributable to the difference in classification system of practice score in which >70% of total score is considered as good practice which is not applied in this study [10].

The other finding on two major behavioral risk factors of foot ulcer that are walking barefoot indoors and outdoors showed that the majority have never walked barefoot. Although the majority of study participants have never walked barefoot, still 15.3% of study participants *repeatedly* walk indoors barefoot while 9.6% routinely walk barefoot outside the house. In fact, this was one of the plausible evidences that triggers the investigator to choose the study area. Even though the majority of respondents were generally knowledgeable and had good practice score, the proportion of respondents walking barefoot is not negligible as it is a high-risk behavior of diabetic foot ulcer. When the proportion is compared with South Africa, it is compatible that the majority 75% have never walked barefoot and 25% reported that they walk barefoot. Similarly, it is compatible with Saudi Arabia in which 18% walk barefoot [7, 10].

The majority of the participants reported that there is a poor and noneducative approach between clients and health care providers. The investigator tried to understand that only patients who were admitted in medical ward before starting follow-up reported thought for different self-care practices including foot care. As depicted in the first section of discussion the reason may be overflow of all chronic patients in one Medical Referral OPD which dictate nurses and physicians to focus on curative services rather than preventive educations.

On the other hand, most patients reported lack of adequate knowledge to specific diabetic foot care principles as another barrier of foot care which may be due to poor communication between patients and health care providers. Previous studies also reported similarly [12].

Of the total participants who had limitation of proper foot care, 23% of study participants reported “inconveniency for work” as main barrier. For example, farmers reported that wearing shoes during plowing is not comfortable as the area is muddy especially in summer season. This study also showed that there is an association between place of residence and inconveniency for work ($\chi^2 = 61.617$, $P = 0.000$). This result is in line with Nigeria in which lack of knowledge, poverty, and poor communication between nurses and patients were the most commonly cited reasons for poor foot care practices, respectively [11].

4.1. Strength of the Study. Adequate sample was recruited. The data collection instruments, especially foot care practice measurement score, were adopted from validated and standardized tool of Nottingham Assessment of Functional Foot Care (NAFFC). The high response rate to the survey interviews (100%) and self-report is the appropriate and cost effective approach of measuring self-care behavior.

4.2. Limitation of the Study. All study participants did not have equal chances to participate in the study due

to convenient sampling technique. Cross-sectional studies enable looking only at the snap shot of foot care practice in the respondents and are difficult to draw cause-effect relationships.

5. Conclusion and Recommendation

Based on the finding, the study concludes that the prevalence of DM is increasing in rural communities and farmers. Generally, half of the study participants have good knowledge of foot care. Half of diabetic patients poorly practice proper foot care. Physicians/nurses gave less attention to foot examination. Respondents had good foot care practices in the areas of washing of feet and not walking barefoot. Relatively educated participants, married individuals, and patients with long duration of diabetic therapy had better knowledge and practice of foot care.

Based on the conclusions made the investigators forwarded the following recommendations. This study is suggestive of alarmingly increasing DM prevalence in rural areas. Therefore, instead of focusing only on infectious diseases, it is an indication that policy makers should give due attention to control the spread of DM in the study area. In order to emphasize foot care education, again policy makers should start a program of developing professional diabetic educators and maybe podiatrists (foot and ankle surgeon) to contribute in the efforts made to control the disease and minimize complications. Furthermore, the hospital administration should establish a specialized DM clinic so that follow-up and education services can be well integrated. Diabetic foot self-care education should be incorporated in the routine health education program of the hospital and it is better if supported with leaflets. Taking consideration of patients' age, educational status, occupational status, duration of diabetic therapy, and other factors is essential while considering individualized foot care education. Moreover, since the risk outweighs the benefit of barefoot working, patients should search for alternative convenient shoes rather than ignoring this during work.

Future researchers should conduct studies in order to investigate the reason for high DM prevalence among farmer participants. Finally, the investigator would like to recommend other researchers to conduct interventional studies in order to determine the magnitude of DFU decreased by preventive education program.

Acronyms

- AOR: Adjusted odds ratio
- COR: Crude odds ratio
- DFU: Diabetic foot ulcer
- LEA: Lower extremity amputation
- NAFF: Nottingham Assessment of Functional Foot Care.

Conflict of Interests

The authors declare that they have no conflict of interests.

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