

ASSESSMENT OF FOOT SELF-CARE PRACTICES AMONG PATIENTS WITH DIABETES AT UNIVERSITY MEDICAL CENTER, HO CHI MINH CITY

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ABSTRACT

Objective: To assess foot self-care practices and related factors in patients with type 2 diabetes at the University of Medicine and Pharmacy Hospital, Ho Chi Minh City.

Methods: This cross-sectional study was conducted on 216 patients from October 2024 to March 2025. Foot self-care practices were assessed using a questionnaire consisting of 9 questions on protective foot care practices and 8 questions evaluating behaviors that may lead to foot injury.

Results: The median age of the study population was 42 (36–47) with 44.4% male, and 49.9% had education below high school level. As many as 69% of the patients had not received information about foot care. Patients aged ≥ 60 , with education below high school level, and lacking foot care information from healthcare staff were found to have lower foot care practice scores ($p < 0.05$). The group of patients more likely to engage in behaviors that pose a risk of foot injury included males ($p = 0.048$) and outpatients ($p = 0.02$).

Conclusion: Foot self-care practices in diabetic patients remain suboptimal, possibly related to education level and a lack of appropriate informational resources. There is a need to implement educational programs on foot care, particularly for high-risk groups.

Keywords: foot care; type 2 diabetes

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1. INTRODUCTION

In 2024, approximately 588 million individuals worldwide was estimated to be diagnosed with diabetes [1]. In those patients, more than 80% was residence of middle to low income countries. On the other hand, diabetes patients is at an increased risk of foot infection, a complication of diabetes, with the prevalence of 15 – 20% during their lifespan [2]. Foot infection greatly impacts the quality of life for both the patients and the caretakers. Studies carried out in European nations estimated that the total cost to care for a patient with foot infection was 13.561 US dollars annually [3].

Helping patients to comprehend their status plays a vital role in preventing aforementioned complication [4]. American Diabetes Association (ADA) [5] and International Working Group on the Diabetic Foot (IWGDF) [6] both highlight the importance of educational program for all patients, especially for those who with even higher risk of foot infection. However, the number of patient appropriately practice foot care is still inadequate. Numerous studies have been done in other parts of the world while Vietnam has few studies on this matter. Therefore, we conduct this survey in order to: (1) assess the frequency and the adequacy as well as inadequacy of practicing self foot care by using the questionnaire compiled by Vileikyte Loretta [7], (2) identify which

factors influence these practices in type 2 diabetes patients of University Medical Centre.

2. SUBJECTS AND METHODS

1.1. SUBJECTS: All outpatients and inpatients of UMC from October, 2024 to March, 2025.

Selection criteria: when a patient has all of the following: (1) age from 18 and above, (2) diagnosed with type 2 diabetes and (3) agree to participate in the survey.

Exclusion criteria: when a patient has one of the following: (1) inability to answer the interviewer and (2) has two feet amputated.

1.2. METHODS:

Study design: cross-sectional

Sample size: A convenience sample was used. The sample size was estimated using the formula: $n = C \times ES^2$, where C is a constant and ES is the effect size, defined as $ES = \mu/\sigma$, with μ representing the desired confidence interval and σ the predefined error. Based on the study by Nguyen Thi Phuong Lan (2019), with $\alpha = 0.05$ and $\beta = 0.2$, C was set at 7.85, with $\mu = 0.05$ and $\sigma = 0.16$, the minimum calculated sample size was $n = 80$.

Data collection process: Eligible patients were informed about the study

objectives and provided informed consent prior to participation. The research team then collected data on medical history, performed clinical examinations, and recorded anthropometric measurements. Laboratory data were retrieved from the electronic medical record system. Foot self-care practices were assessed using the questionnaire developed by Vileikyte Loretta et al., which had been translated and validated in Vietnamese by Nguyen Thi Phuong Lan. Each participant was instructed to complete all items related to both preventive foot-care behaviours and behaviours posing a risk to foot injury according to the questionnaire structure.

Statistical analysis: Data were analysed using JASP version 0.19.3. Categorical variables were presented as frequencies and percentages and compared using the chi-square test. Normally distributed continuous variables were expressed as means and standard

deviations, whereas non-normally distributed variables were presented as medians and interquartile ranges, and compared using the Student’s *t* test or the Mann–Whitney *U* test as appropriate. Statistical significance was set at $p < 0.05$.

Ethical considerations: The study was approved by the Ethics Committee for Biomedical Research of the University of Medicine and Pharmacy at Ho Chi Minh City under Decision No. 3064/ĐHYD-HĐĐĐ dated October 17, 2024.

2. RESULTS

A total of 216 patients were enrolled. The median age was 42 (36–47) years, and males accounted for 44.4%. Nearly half of the patients had an educational level below high school, and 69.0% had no source of information regarding foot care (Table 1). Participants were recruited from both inpatient (31.9%) and outpatient (68.1%).

Table 1. Demographic and clinical characteristics of the participants (n=216)

Characteristics	Result
Age (median) ^s	42 (36 – 47)
< 60, n(%)	87 (40.3)
≥ 60, n(%)	129 (59.7)
Male, n(%)	96 (44.4%)
BMI (kg/m ²)	23.7 ± 0.2
Educational level, n(%)	
Below high school	108 (50%)
High school and above	108 (50%)

Source of foot-care information, n(%)	
<i>None</i>	149 (69.0)
<i>Healthcare professionals</i>	40 (18.5)
<i>Other sources</i>	27 (12.5)
Treatment setting, n(%)	
<i>Inpatient</i>	69 (31.9)
<i>Outpatient</i>	147 (68.1)
Diabetes duration (year) ^s	10 (4-17)
HbA1c (%) ^s	7.6 (6.7 – 9.1)

^sData are presented as median (standard deviation)

Table 2 presents the frequency of protective foot-care practices. The proportion of patients who self-inspected their feet twice daily was 23.0%, whereas 44.0% reported never performing foot inspection. Regarding foot hygiene, 53.2% washed their feet once daily and 38.4% twice daily; only 5.6% reported not washing their feet during the previous week. Risk-related practices such as wearing shoes without socks occurred in 20.4% of patients more than once per day, while 51.9% reported never doing so. Notably, 51.9% did not change socks during the week, 26.4% changed them once daily, and 4.6% twice daily. Most patients (89.8%) reported never walking barefoot outdoors.

Table 2. Frequency of protective foot-care practices a week before interview

Questions, n(%)	Never	Once a week	Twice a week	Every other day	Daily	Twice a day
Examine your feet?	95(44.0)	11(5.0)	2(1.0)	3(1.4)	55(25.0)	50(23.0)
Wash your feet?	12(5.6)	2 (0.9)	2(0.9)	2(0.9)	115(53.2)	83(38.4)
Test water temperature with your hand/elbow?	129(59.7)	2(1.0)	0(0.0)	1(0.5)	52(24.0)	32(15.0)

Use moisturizing oils or creams for your feet?	189(87.5)	4(1.9)	3(1.4)	1(0.5)	11(5.1)	8(3.7)
Wear shoes without socks?	112(51.9)	6(2.8)	13(6.0)	7(3.2)	34(15.7)	44(20.4)
Change your socks?	112(51.9)	9(4.2)	15(7.0)	13(6.0)	57(26.4)	10(4.6)
Check inside of your shoes?	108(50.0)	5(2.3)	3(1.4)	2(1.0)	50(23.2)	48(22.2)
Walk barefoot indoors?	97(45.0)	3(1.4)	1(0.5)	2(1.0)	38(17.6)	75(34.7)
Walk barefoot outdoors?	194(89.8)	6(2.8)	5(2.3)	0(0.0)	6(2.8)	5(2.3)

Table 3 summarizes behaviours associated with increased risk of foot injury. Only 9.7% of patients always had their feet measured when purchasing new shoes. Notably, 75.5% always relied on perceived fit when buying shoes. Regarding nail care, 38.9% always trimmed nails correctly (straight cut), whereas 33.8% never did so.

Table 3. Behaviours associated with increased risk of foot injury

Questions, n(%)	Never	Occasionally	Most of the time	Always
Have your feet measured when buying a new pair of shoes?	163(75.5)	14(6.5)	18(8.3)	21(9.7)
Rely on feeling the fit of the shoes when buying a new pair?	14(6.5)	12(5.6)	27(12.5)	163(75.5)
Wear lace-up shoes?	145(67.1)	40(18.5)	12(5.6)	19(8.8)

Cut toenails straight across?	73(33.8)	36(16.7)	23(10.6)	84(38.9)
Wear sandals or slip-ons?	89(41.2)	39(18.0)	39(18.0)	49(22.7)
Use heating pads to warm cold feet?	195(90.2)	13 (6.0)	3(1.4)	5(2.3)
Use chemical agents to remove corns?	209 (96.8)	2(0.9)	3(1.4)	2(0.9)
Treat corns/calluses with a blade?	195(90.3)	9(4.2)	7(3.3)	5(2.3)

Patients younger than 60 years had a higher mean total score for protective foot-care behaviours compared with those aged ≥ 60 years (3.6 ± 1.4 vs 3.1 ± 1.5), with a statistically significant difference ($p = 0.02$) (Table 4). Participants with at least a high school education had significantly higher mean scores than those with education below high school ($p < 0.001$). Protective practice scores differed significantly by source of information ($p = 0.01$), with the highest mean score observed among patients counselled by healthcare professionals (4.1 ± 1.5).

Table 4. Differences in total protective foot-care practice scores by population characteristics

Characteristic	Total score	P
Age (years)		
< 60	3.6 ± 1.4	0.02
≥ 60	3.1 ± 1.5	
Gender		
Male	3.2 ± 1.2	0.7
Female	3.4 ± 1.7	
Educational level		
Below high school	3.0 ± 1.4	<0.001
High school or above	3.6 ± 1.4	
Treatment setting		
Inpatient	3.2 ± 1.6	0.2
Outpatient	3.4 ± 1.4	

Source of foot-care information		
<i>None</i>	3.1 ± 1.4	0.01
<i>Healthcare professionals</i>	4.1 ± 1.5	
<i>Other sources</i>	3.4 ± 1.3	
Overall mean score	3.3 ± 1.5	

For risk-related behaviours (Table 5), males had higher mean risk behavior scores than females (2.5 ± 0.9 vs 2.2 ± 1.0), with a statistically significant difference (p = 0.048). Additionally, outpatients exhibited higher risk behavior scores compared with inpatients (p = 0.02).

Table 5. Differences in total scores for behaviors associated with increased risk of foot injury by population characteristics.

Characteristic	Total score	p
Age (years)		0.8
<i>< 60</i>	2.3 ± 0.9	
<i>≥ 60</i>	2.3 ± 1.0	
Sex		0.048
<i>Male</i>	2.5 ± 0.9	
<i>Female</i>	2.2 ± 1.0	
Educational level		0.08
<i>Below high school</i>	2.5 ± 1.0	
<i>High school and above</i>	2.2 ± 0.9	
Treatment setting		0.02
<i>Inpatient</i>	2.1 ± 1.0	
<i>Outpatient</i>	2.4 ± 1.0	
Source of foot-care information		0.2
<i>None</i>	2.4 ± 1.0	
<i>Healthcare professionals</i>	2.0 ± 1.0	
<i>Other sources</i>	2.5 ± 0.9	
Overall mean score	2.3 ± 1.0	

3. DISCUSSION

Our study demonstrated that foot self-care practices among patients with type 2 diabetes at the University Medical Center Ho Chi Minh City remain limited, particularly regarding proactive preventive behaviors. As many as 44% of patients reported never inspecting their feet, nearly 60% did not check water temperature before washing their feet, and the majority did not use moisturizers or inspect their footwear. Risk-related behaviors such as wearing shoes without socks, walking barefoot, or self-managing calluses were still present at a considerable frequency. These findings are consistent with the study by Duong Thi Ngoc Lan, which reported that 64.48% of patients had poor knowledge and practices related to foot care [9].

The proportion of patients who did not access any source of foot-care information (69%) is also consistent with reports from studies conducted in Vietnam evaluating the effectiveness of foot-care education programs, in which most patients were inadequately instructed prior to intervention [8]. Lower educational attainment (below high school) was associated with lower preventive practice scores and a higher prevalence of risk behaviors. This observation aligns with findings from a study conducted at Saint Paul General Hospital, where patients with lower educational levels demonstrated poorer knowledge–attitude–practice

scores related to diabetic foot care [10].

Information provided by healthcare professionals emerged as the most influential factor affecting preventive practices. Patients who received counseling from healthcare staff achieved the highest preventive practice scores (4.1 ± 1.5), which is consistent with the findings of Do Dinh Tung et al., showing that patients who received direct counseling were more likely to adopt appropriate foot-care practices compared with those who did not receive counseling [10]. These results emphasize the effectiveness of healthcare professional–led education in modifying behaviors to prevent diabetic foot complications, in accordance with the recommendations of the American Diabetes Association and the International Working Group on the Diabetic Foot regarding routine patient education [4,6].

Several limitations of this study should be acknowledged. First, the cross-sectional design does not allow causal relationships to be established, but only describes associations between variables. Second, the use of self-reported data may introduce recall bias. Third, as the study was conducted at a tertiary referral hospital, the findings may not be representative of all patients with diabetes in the community. Finally, although the questionnaire was adapted from an international instrument, some behaviors may not fully reflect Vietnamese cultural practices.

4. CONCLUSION

Foot self-care practices among patients with type 2 diabetes in Vietnam are suboptimal, particularly among individuals with lower educational levels, male patients, older adults, outpatients, and those who do not receive direct counseling

from healthcare professionals. These findings highlight the need for structured and routine foot-care education programs, with particular emphasis on high-risk groups, to improve preventive behaviors and reduce the burden of diabetic foot complications.

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