



Self-confidence and Foot Self-care Behavior in Patients with Diabetes Mellitus: A Cross-sectional Study

Anita Joeliantina, Dwi Adji Norontoko, Sri Hardi Wuryaningsih, Padoli

Department of Nursing, Poltekkes Kemenkes Surabaya, Indonesia
anita@poltekkesdepkes-sby.ac.id

Abstract. Diabetic Foot Ulcers (DFU) are one of the most severe complications of Diabetes Mellitus (DM) and require important foot self-care to prevent the occurrence of DFU. The study aimed to identify the self-confidence and foot self-care practice of patients with DM who experience DFU. The design of this study was cross-sectional, with a sample size of 44 adults with DM who had a history of foot ulcers or were currently having foot ulcers who were recruited using convenience sampling techniques. The research was conducted from June to August 2022 at six community health centers in Surabaya, East Java. Data collection used a questionnaire. Data analysis used descriptive analysis and the Pearson correlation test. Patient characteristics showed that 43.2% were aged around 56-65, 53.27% were male, and 37 (84.09%) had comorbidities. Data regarding the Body Mass Index was 28 patients (63.64) were expected, the duration of DM was 43.18% was < 6 years and the blood glucose level of 61.36% was > 200 mg/dl. Most of the 30 patients (68.18%) were DFU. Patients who had low self-confidence were 25 (56.82%). Foot self-care practice shows inadequate practice 39 (88.64). The significant relationship between self-confidence and foot self-care was $p = 0.02$ ($p < 0.05$). In general, patients still have inadequate foot self-care practice. It turns out that patients with high self-confidence also have adequate foot self-care approaches, although these results are inconsistent. This needs to get attention from health workers to continue providing education about foot self-care.

Keywords: Diabetes Mellitus, Foot Ulcer, Self-Confidence, Foot Self-Care.

1 Introduction

Indonesia is the country with the most significant number of adult diabetes mellitus (DM) sufferers aged 20–79 years, which is ranked fifth in the world in 2021 and has increased from the previous year [1][2]. Diabetic foot disease is a common chronic complication of diabetes and usually presents as ulcers with or without infection, accompanied by peripheral neuropathy or peripheral vascular disease [2]. DFU is a severe and expensive complication of DM and can end in the amputation of the lower extremities [17].

The prevalence of foot ulcers has increased globally due to the worldwide burden of diabetes mellitus and poor diabetic foot self-care practices [5][6]. Foot self-care practices are essential self-management behaviors to prevent diabetic foot ulcers. Prevention of foot complications should be emphasized because foot ulcers of neuropathic origin are highly preventable, and prevention is better than cure [17]. Patients with type 2 diabetes should take an active role in daily foot self-management. This is important for improving diabetic foot health, protecting against diabetic foot ulceration, and obtaining early treatment for new foot ulcerations [19].

Independent foot care is a variety of activities designed to reduce the risk of diabetes-related foot complications that patients can do at home, either alone or with the support of other non-professional caregivers [18]. Unfortunately, many people with type 2 diabetes find it difficult to change their behavior and adhere to self-management regimens, which often has adverse consequences for foot health. The reasons for non-compliance are complex; for example, patients consider foot care a lower priority than adherence to medication or blood glucose control [19]. Several factors cause inadequate foot self-care behavior. These were patients with DM who lived alone and had a shorter duration of suffering from DM, male gender, and lower health confidence scores [26].

Self-care beliefs are not elements of self-care but factors that significantly influence self-care maintenance, monitoring, and management. Self-care beliefs reflect a patient's confidence level about their ability to perform a specific self-care-related task. Thus, self-confidence reflects self-efficacy or the ability to perform a particular action and persist in carrying out that action or behavior despite obstacles or challenges [10][11]. Lack of confidence in integrating multiple self-care recommendations allows for the emergence of conflict and the inability to cope with the burden experienced [22]. Regarding DFU prevention, low commitment and low self-confidence of patients with DM toward self-care practices still often occur [9][13]. So, it is necessary to research patient confidence in self-care to prevent the occurrence of DFU or reduce its severity of DFU.

There has been a lot of research on foot self-care in Indonesia, as have the factors that influence its implementation. However, these factors are limited to the characteristics of patients with DM, both sociodemographic and clinical characteristics. However, research on the self-confidence of patients with DM is still minimal. Existing research still shows inconsistent results. Therefore, this study aims to identify the self-confidence and foot self-care behavior of patients with DM who experience DFU.

2 Method

2.1 Study design

This research is a descriptive study with a cross-sectional approach.

2.2 Setting and Participants

Using a convenience sampling technique, the sample was 44 adults with DM with a history of foot ulcers or were currently experiencing foot ulcers recruited from 6 community health centers in Surabaya, East Java. Inclusion criteria were having a diagnosis of DM, experiencing DFU (history or moderate), and being more than 36 years old. Exclusion criteria were patients in an unstable condition and having cognitive impairment.

2.3 Data collection

The research was conducted from June to August 2022 at six community health centers in Surabaya, East Java. All eligible participants were asked to complete a self-administered questionnaire regarding the characteristics and presence of foot deformity, all written in Indonesian. Questionnaire distribution was carried out from patients who visited the health center. Before data collection, researchers explained the purpose of the study and ensured that written consent was obtained and that patient participation was voluntary.

2.4 Measurements

Data were collected using a questionnaire of characteristic data, including age, gender, smoking history, BMI, length of suffering, family history, random blood glucose levels, and the incidence of DFU. Collection of data on characteristics using the Form of the integrative assessment of patients with diabetes mellitus [12]. Foot self-care management and foot self-care confidence were modified and combined with questions from the Self-Care of Diabetes Inventory (SCODI) [3] and Diabetic Foot Management [6][11][17]. The number of foot self-care management questions was 30, and foot self-care confidence was 15. Foot self-care confidence was measured using a Likert scale with strongly agree, agree, disagree, and strongly disagree categories. Self-confidence assessment is positive if the score is $>$ mean and negative if $<$ mean. Meanwhile, measuring foot self-care management behavior uses a Likert scale with the categories always, often, sometimes, rarely, and never, with a higher rating indicating better behavior.

2.5 Data analysis

Descriptive statistics, including frequency, percentage, mean, and standard deviation, were used to understand the distribution of patient characteristics, disease attributes, diabetic foot self-care behavior scale, and confidence scale in caring for diabetic foot ulcers. The Pearson correlation test was used to test the correlation between self-confidence and foot self-care behavior. The significance level set is p value <0.05 and is two-sided.

2.6 Ethical approval

Ethical approval was obtained from the Poltekkes Ethics Institute of the Ministry of Health Surabaya: No. EA/ 901/KEPK-Poltekkes_Sby/V/2022 and administrative were obtained from the Surabaya Health Office for each selected Puskesmas before data collection.

3 Results

The number of patients involved in this study was 44 patients. Patient characteristics showed that 43.2% were around 56-65 years old, and 53.27% were male. Regarding comorbidities, patients 37 (84.09%) had comorbidities. Data regarding BMI showed that most 28 patients (63.64) had average weight, and two were thin. Regarding the disease duration, almost half of the patients experienced DM < 6 years, 43.18%. Regarding data on blood glucose levels, more than half (61.36%) had blood glucose levels > 200 mg/dl. Patients with DM involved in this study experienced DFU either as a history or currently having DFU, where the majority of patients, 30 (68.18%), were currently having DFU (Table 1). Table 1 also shows a cross-tabulation between patient characteristics and self-confidence. Of the 14 patients with a history of DFU, 11 patients had high self-confidence.

Table 1. Characteristics of patients with DM, 2022 (n=44).

Characteristics	n (%)	Self-confidence	
		Low n (%)	High n (%)
Age (years)			
36-45	4 (9.1)	4 (9.09)	0 (0.00)
46-55	14 (31.8)	11 (25.00)	3 (6.82)
56-65	19 (43.2)	12 (27.27)	7 (15.91)
>65	7 (15.9)	4 (9.09)	3 (6.82)
Sex			
Male	21 (47.73)	16 (36.36)	7 (15.91)
Female	23 (52.27)	15 (34.09)	6 (13.64)
Co-morbidities			
No	7 (15.91)	5 (11.36)	2 (4.55)
Yes	37 (84.09)	26 (59.09)	11 (25.00)
BMI (kg/m²)			
<18,5	2 (4.55)	0 (0)	2 (4.55)
18,5-25	28 (63.64)	21 (47.73)	7 (15.91)
25-27	6 (13.64)	4 (9.09)	2 (4.55)
>27	8 (18.18)	6 (13.64)	2 (4.55)
Duration of DM (years)			
< 6	19 (43.18)	15 (34.09)	4 (9.09)
6-10	16 (36.36)	10 (22.73)	6 (13.64)
>10	9 (20.45)	6 (13.64)	3 (6.82)

Characteristics	n (%)	Self-confidence	
		Low n (%)	High n (%)
Random blood sugar level			
< 200 mg/dl	17 (38.64)	11 (25.00)	6 (13.64)
≥ 200 mg/dl	27 (61.36)	20 (45.45)	7 (15.91)
DFU Occurrence			
History DFU	14 (31.82)	3 (6.82)	11 (25.00)
Currently DFU	30 (68.18)	28 (63.64)	2 (4.55)

More than half of the patients with DM involved in this study had low self-confidence 31 (56.82%). Meanwhile, most data for foot self-care showed inadequate behavior 39 (88.64). The relationship between self-confidence and foot self-care is significant, with a value of $p = 0.02$ ($p < 0.05$) (Table 2). Patients who have adequate foot self-care also have high self-confidence.

Table 2. Table captions should be placed above the tables.

Variable	Foot Self-care			p-value
	Adequate n (%)	Fairly adequate n (%)	Inadequate n (%)	
Self-confidence				0.001
Low	0	0	31 (56.82)	
High	0	5 (11.36)	8 (31.82)	

4 Discussion

This study has identified the characteristics of patients with DM, self-confidence, and foot self-care behavior. In general, the results of this study showed that patients with DM had low self-confidence and inadequate foot self-care. The finding in this study is that there is a significant relationship between self-confidence and foot self-care behavior. Previous results showed that fifty-six percent of patients with diabetes had poor foot self-care behavior and glucose level monitoring [13] [11]. Other studies have also shown that foot self-care deficit may be associated with the occurrence of DFU and the cure of DFU [16]. Related to self-confidence, some studies show that there is a relationship between self-efficacy and foot care behavior [20].

Many factors influence a person's self-confidence in carrying out foot self-care. Patient characteristics can be a factor related to self-confidence. In this study, men and women had equally low self-confidence. Most patients with diabetes in this study had comorbidities and high glucose levels. They also have low self-confidence. Existing research has found that living alone, shorter duration of diabetes, male gender, and lower health confidence scores predict less adequate diabetic foot self-care behavior [1, 26]. BMI and Comorbids were not significantly associated with DFU incidence [25]. Based on these data, it shows that the relationship between patient characteristics and

self-confidence is still inconsistent. However, high glucose levels and obesity can be the cause of DFU or slow down the healing process of DFU.

Self-management is known to be at the core of diabetic foot ulcer prevention measures [18]. Patients with diabetic foot ulcers in the study had inadequate foot care. In addition, patients with diabetic foot ulcers who have high blood glucose levels. In research conducted on patients with DM without DFU, behaviors about monitoring blood glucose levels and foot care such as: checking feet regularly, applying lotion on the feet, doing foot gymnastics, and drying the feet need to be still not appropriate [13] [5]. Another study conducted during the COVID-19 pandemic in patients with DM accompanied by DFU or without DFU also showed the same result, namely still poor foot care [14]. Hyperglycemia can disrupt the blood supply to nerves and cause decreased nerve sensitivity to pressure and trauma. This can be the cause of the development of diabetic foot ulcers in patients with DM. Uncontrolled hyperglycemia should also be monitored because the condition will slow the healing process of the ulcer and increase the risk of recurrence in patients who have a history of ulcers

High confidence about foot care behavior in patients with diabetes is expected to improve patient adherence to treatment. Similar results also showed that the application of health belief models to the self-care of diabetic patients had a significant influence on health behaviors [26]. Self-care beliefs reflect a level of confidence a patient has about his or her ability to perform certain self-care-related tasks [3, 21] [8]. Another study that supports this research is that high self-efficacy improves foot-care behavior and prevents diabetic foot [20]. Patients who have high self-confidence, in fact, he can accept his sick condition and want to equip himself in preventing the severity of a disease. In addition, patients who have high self-confidence will have greater motivation and desire to heal, so there is a strong urge to manage the disease including foot wasting. The study has several limitations. First, this study used a structured questionnaire to investigate self-confidence and foot self-care behavior, evaluated via self-report. Researchers did not observe and grade DFU injuries experienced by patients. Second, because of the small sample size of our study, the findings might have been different if the participants had been more prominent and the locations varied. Third, the findings of this study may not be generalizable to other geographic regions in Indonesia due to different locations.

5 Conclusion

This study has identified self-confidence and foot self-care behavior of patients with DM who have a history of DFU or are currently DFU. In general, patients still have inadequate foot self-care behavior and none of the patients have adequate foot self-care behavior. Most patients with DM in this study also had low self-confidence. So it can be concluded that there is a relationship between self-confidence and foot self-care behavior, where patients who have low self-confidence are followed by inadequate foot self-care behavior. This requires attention from health workers to increase patient confidence in doing foot self-care, in order to avoid DFU complications. In addition, nurses as part of health services must emphasize the importance of foot self-care for patients

and increase motivation in patients to continue to carry out foot self-care. It may be necessary to study intervention strategies to increase patients' self-confidence in self-care, especially foot self-care.

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