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Diabetic Patients' Perception of Diabetic Foot Ulcers: A Qualitative Study

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Abstract

Background: Diabetic foot ulcer (DFU) is one of the serious and debilitating challenges faced by patients with diabetes, which imposes a financial burden on both patients and healthcare systems. Although this problem can be prevented and treated by proper foot care techniques, many patients do not follow the recommendations. Accordingly, this study aimed to rely on deep insight and knowledge to explain diabetic patients' perception of DFU and identify appropriate care and support practices to prevent and manage it.

Methods: This descriptive study was conducted using qualitative content analysis. The participants were 15 patients with diabetes, who visited the healthcare centers in Shahrekord, Iran selected using purposive sampling. Data were collected through face-to-face and semi-structured interviews with the participants until data saturation. Data were analyzed simultaneously with data collection using the method proposed by Graneheim and Lundman.

Results: Data analysis led to the identification of four main categories including *being destined to a doomed fate*, *self-treatment*, *indifference to obsessive care*, and *care-inhibiting beliefs*.

Conclusion: To gain a deeper understanding of standard foot care, the causes of foot ulcers, preventive care services, and existing treatments, different strategies can be adopted such as peer education or using the experiences of other patients with ulcers.

Keywords: Diabetic ulcer, Diabetic foot, Diabetes complications

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Introduction

Diabetes is a common disease and one of the major health problems worldwide (1), and the World Health Organization (WHO) refers to it as a silent epidemic (2). According to the International Diabetes Federation (IDF) (2013), there are 382 million people with diabetes worldwide. It is predicted that more than 592 million people will be affected by 2025 (3). The prevalence of diabetes is 15% in Iran (4); this prevalence is on the rise, which is a warning sign of the unfavorable control of diabetes among Iranians (4,5). Unsuccessful diabetes management is associated with serious multiple long-term complications, including constriction of blood vessels, nephropathy and retinopathy, peripheral neuropathy, and problems of the cardiovascular system (6).

Diabetic foot ulcer (DFU) affects the quality of life of patients with diabetes, carries the risk of amputation, and imposes a great financial burden (7-14). DFU is a serious chronic complication of diabetes mellitus (15). The global prevalence of DFU is 6.3%, and its prevalence in North America, Asia, Europe, Africa, and Oceania is 13.0%, 5.5%, 5.1%, 7.2%, and 3.0%, respectively. DFU is more prevalent in males than in females, and it is more prevalent in type 2 than in type 1 diabetic patients (16). The chance of DFU is about 30% in patients with diabetes, resulting in amputation in 85% of cases (17).

People with DFU have a lower quality of life than those without. Moreover, depression is more prevalent among them (18), which highlights the importance of DFU prevention to reduce economic, physical, and mental burdens.

Although many problems can be prevented with proper management, self-care practices are considered among the most important factors in DFU management. However, some studies indicate unsuccessful management of diabetes in Iran (19).

Perception of disease is an effective factor in health and disease management (20). Studies indicate that several factors, such as perception of foot ulcer management, are influential and people with different perceptions adopt different ulcer-care practices, sometimes leading to self-care failure (21-24). Evidence shows sometimes

those perceptions that seem correct to a person result in the worsening and progression of the ulcer, highlighting the importance of providing diabetic patients with information about the ulcer and its prevention.

The significance of the patient's perception in improving successful foot care involvement has been taken into consideration. Investigating the views and experiences of patients with DFU may help us better understand the factors contributing to their participation in foot care and identify intervention goals. It is required to effectively promote these behaviors and ensure that recommended practices match the needs of patients and their interpretations of these conditions (25). Various studies show one of the influencing factors in changing the behavior of patients to prevent DFU is the individual's perception of this problem (23,26,27).

This highlights the importance of providing diabetic patients with information about the ulcer and its preventive methods. Showing patients with diabetes how to prevent and manage DFU is a nursing task. As one of the most important members of the healthcare team, nurses have a positive impact on DFU prevention and wound healing by promoting interprofessional healthcare and collaborating with other healthcare professionals (28). Explaining the perception of patients with diabetes to healthcare providers may help them identify potential barriers and facilitators of foot care improvement in these patients (20). Accordingly, the present study was conducted to explain diabetic patients' perception of DFU and its preventive methods.

Methods

Design

This qualitative study was conducted using a conventional content analysis approach (29), which is a research technique for making replicable and valid inferences from texts (or other meaningful matter) to the contexts of their use (30)

Participants and recruitment

A total of 15 patients with diabetes were selected considering variation in age, gender, education level, and work experience. The study was conducted at the healthcare centers of the Shahrekord University of Medical Sciences (located in Shahrekord, an old city with Bakhtiari culture) in Iran.

Data collection

Informed consent was obtained from the participants and they were assured of the anonymity and confidentiality of the information. Data were collected from October 2022 to May 2023 using deep, semi-structured, face-to-face interviews focused on diabetic patients' perception of DFU and its preventive methods. The interviewer did not know any of the participants before the study. To ensure consistency, all interviews were conducted by LM, a female researcher with a PhD in nursing who was experienced in qualitative research.

The interviews were conducted in a quiet room (based on participants' preferred locations either in the healthcare centers or outside the centers) and audio-recorded. Each interview lasted 40 to 60 minutes. LM made field notes for each interview. An interview guide was developed based on the primary interview. The researcher asked participants to describe what they thought about DFU and what preventive methods they used. Sampling and data analysis continued until data saturation, when no new information or category was extracted (30). In total, 15 interviews were conducted.

Data analysis

The inductive qualitative content analysis method outlined by Graneheim and Lundman was used for data analysis (29). Two researchers (LM and RJ) analyzed the data to reduce the influence of researchers' personal experiences and beliefs. The recorded interviews were transcribed verbatim and read through several times to obtain a general understanding. At first, researchers extracted all meaning units, independently. Then, they discussed the units and after resolving discrepancies, assigned codes to the condensed meaning units, reflecting the words of the participants more abstractly. Finally, basic codes were created and compared based on differences and similarities and sorted into nine subcategories and four main categories. Data were analyzed manually.

Rigor

The trustworthiness of the data was confirmed based on the criteria proposed by Guba (31). Confirmability was enhanced by registering and reporting various steps of the study. Credibility was established by using prolonged involvement with the data. To ensure dependability, a limited literature review was conducted at the beginning of the study to avoid bias during data analysis. To facilitate transferability, researchers provided information about the research setting and sampling.

Ethical considerations

All participants were informed of the objectives of the study and gave written consent. The research project was approved by the Ethics Committee of Shahrekord University of Medical Sciences (IR.SKUMS.REC.1401.103). Written informed consent was obtained from the participants regarding the aim of the study, confidentiality of the information, anonymity of the data, voluntary participation in the study. Moreover, the participants were assured that nonparticipation would not lead to any disadvantages for them, and they could leave the study at any stage they desired. The study followed the Declaration of Helsinki.

Results

A total of 15 diabetic patients without a history of DFU were selected using purposive sampling (Table 1). After data analysis, four main categories were extracted including *being destined to a doomed fate*, *self-treatment*, *indifference to obsessive care*, and *care-inhibiting beliefs* (Table 2).

Being destined to a doomed fate

Patients had different perceptions of DFU. Some participants believed that they would never develop DFU and had a sense of immunity. Others believed that all diabetic patients would be finally affected. Some participants said they would not get DFU by following their pharmaceutical diet and controlling their blood sugar levels every day. According to one of them, "*I think I will never have this problem myself. My blood sugar is under control and I don't think these problems will happen to me*" (Participant 5).

Some religious participants believed that God would protect them from the foot ulcer and they would not be inflicted, "*God gave the pain and would give the treatment too*" (Participant 1). Another participant said, "*I say, God Himself would help*" (Participant 11).

Table 1. Demographic characteristics of participants

	Female	Male	Total
Age			
18-29	1	0	1
30-49	2	2	4
50-69	5	4	9
70 years and older	0	1	1
History of diabetes			
<5	2	3	5
5-10	2	2	4
>10	4	2	6
Educational attainment			
Illiterate	1	1	2
Basic literacy	5	3	8
Diploma	0	2	2
Academic education	2	1	3
Marital status			
Single	0	1	1
Married	6	6	12
Divorced	0	0	0
Widow	2	0	2
Occupation			
Employed	1	1	2
Unemployed	0	3	3
Housewife	6	0	6
Retired	1	3	4

Some participants believed DFU is a scary and doomed circumstance, "*It is very terrible and looks very bad*" (Participant 2). They argued that DFU is a certain fate for all diabetic patients, discouraging them from taking preventive measures, "*I believe that all of us (as we have high blood sugar levels) would finally be affected. It ends in death. When I'm going to die, I don't have a reason to control blood sugar. There is no motivation when it ends in death*" (Participant 6). Another participant believed that suffering from DFU is inevitable, "*If sugar level increases, there would be no control over it anymore and leaves nothing other than sickness at the end*" (Participant 12).

Self-treatment

Fear of developing DFU leads to self-regulatory medication-taking behaviors or using indigenous medicine among many participants. According to some participants, they used over-the-counter topical medications due to the fear of developing DFU. A participant said, "*When I have an ulcer, I apply moisturizer or ointment (Alfa ointment and Vaseline) and it gets better. Once my right big toe's skin was cracked, I applied ointment, took my pills on time, and massaged my feet until it got better*" (Participant 10).

One of the participants thought the foot ulcer develops because of long walking and thus decided to limit it. Some others reported they increased drug dose due to the fear of getting DFU, "*Sometimes I feel my sugar level is high and I take metformin after lunch. I take cholesterol-lowering pills. When my sugar level goes up, I feel it and get exhausted. My mouth gets dry and I take a glucose-lowering pill*" (Participant 8).

A participant said he uses traditional therapy to better control blood sugar levels, "*I mostly watch my eating and eat what is good for blood sugar, like coffee and date kernels, they say they are good for controlling blood sugar*" (Participant 1).

Indifference to obsessive care

Some participants stated that since they have not had foot problems so far, they do not need to take any specific measures. The participants mentioned concomitant

Table 2. Category and Sub-category

Category	Sub-category
Impossible destiny to a sinister fate	Immune from get in trouble
	Inevitable event
	Deadly and scary
Self-treatment	Traditional therapy
	Non-doctor prescription
Indifference to obsessive care	Not taking serious
	Obsessive care
Inhibiting beliefs	Lack of knowledge
	False beliefs

infection to other diseases was the cause of paying less attention to future diabetes complications, "*I am suffering so much from other diseases that I don't know why I don't take sugar level seriously. This new year, I saw someone's finger amputated because of sugar (level), but I don't know why I don't take it seriously. Everyone tells me not to eat sweets, not to drink soft drinks, but I do*" (Participant 3).

Another participant attributed his indifference to foot care to stress caused by it and said, "*I am not very sensitive but my daughter is. I have stress when I visit for tests once every three months. I get stressed if I want to measure it at home. It is also two months since my right big toe nail suddenly hurt in sleep, and it remains the same. I let it get better, God willing. If it gets worse, I will go to the doctor*" (Participant 14).

A participant expressed that when growing old, some patients become indifferent to DFU and other complications of diabetes, "*For some patients, it doesn't matter, they say that our life has passed and this doesn't do anything for us, let us live our lives and thus they turn careless about it. For many, it is not important to them*" (Participant 10).

Some other participants reported becoming obsessed with foot care because of the fear of foot ulcers, "*Since I sweat a lot, my toes get cracked and I always have intrusive thoughts of having toe ulcers and I look at them a hundred times a day. I somehow get the obsession. I always think about ulcers. Sometimes, when I clip my toenails carelessly, I am very afraid of hurting my toenails. I usually ask my husband to clip my toenails and I emphasize doing it in a way that won't bother me. I mean I wanted him to clip them so that they don't get uneven and grow in my toe flesh. Despite all these precautions, every 10 days my husband must clip the corners of my nails grown in the flesh with nail clippers*" (Participant 15).

Another participant mentioned the fear of foot ulcers as a reason to take care of his feet, "*I am very afraid of diabetic ulcers. I frequently check the soles of my feet for any ulcers. If I see any peeled skin, I quickly use a moisturizer so that it gets better*" (Participant 9).

Care-inhibiting beliefs

The participants mentioned some beliefs that limited proper foot care; for instance, they pointed that there is insufficient knowledge about foot care, FDU complications would be forgotten over time, the trainings need to be repeated, and only diet and treatment can prevent DFU, "*Since we are not involved, we cannot understand it; because most of the time, one forgets and is not aware. But I think when you are not involved, you will forget it. I know someone whose eyes were involved, I said to him, what about your feet? He asked whether it also affects my feet. Is it get involved too? Most of the time, we don't understand it until we are involved with diabetes complications. Knowledge is one part of it. On the other part, they say checking the sugar level is enough*" (Participant 7).

Another participant said, "*I think it can be controlled by the pills, and no extra measures are needed*" (Participant 9). A participant said that he does not feel fear and anxiety about getting DFU, inhibiting him from adhering to his therapeutic diet, "*Everybody fears but not me. Everybody tells me not to eat cookies, and not to drink carbonated soft drinks, but I do. I say God is with us. I say God Himself would help*" (Participant 4).

Most participants stated that since they have not had any problems, they have not taken any special foot care measures. "*So far, I haven't had any special problems, thank God, I mostly watch my eating and eat what is good for blood sugar, like coffee and date kernels, they say they are good for controlling blood sugar. I go walking whenever I can*" (Participant 8).

Discussion

The findings from this study showed that patients with diabetes have different perceptions of DFU. A wide range of ideas and feelings were reported about foot ulcers, such as fear, panic, anxiety, and the inevitability of amputation following DFU. Some held the belief that there would be no recovery after developing DFU, that the foot ulcer would result in the patient's death, and that diabetic patients would certainly develop DFU. Moreover, some participants reported a feeling of immunity from DFU, a lack of proper understanding and knowledge about foot ulcers, and not taking the risk of DFU seriously. The main findings of this study showed that most patients do not have any idea about foot ulcers as they have not experienced them and thus do not take them seriously.

The majority of participants said they never thought they would develop DFU, had a sense of immunity, and did not even think about it, while it is essential to have a true insight and think about the factors that cause DFU (32). It seems that health service providers can create a correct perception of foot ulcers in patients by talking with them (9).

Exploring the patients' experiences showed that most participants believed adhering to their medications immunizes them against DFU. This finding indicated patients did not have sufficient knowledge about the etiology of DFU and its development process, which is consistent with other studies (13,14). This highlights the importance of providing proper education to increase knowledge and subsequently change their attitude toward foot care. Moreover, meeting people with a history of DFU can help to provide patients with a correct perception (18).

On the other hand, the belief in the incurability of DFU causes a lot of panic and fear in some patients. Some patients believed developing DFU is the final and certain fate of all patients with diabetes and that they cannot take any special preventive measures, indicating the insufficient knowledge of patients about DFU development. This

finding is consistent with other studies, suggesting that most patients have inadequate knowledge about foot care through precise examinations, such as foot temperature measurement (33).

Evidence shows DFU and amputation are the consequences of poor foot care (34,35). Taksande et al analyzed the knowledge, attitude, and performance of diabetic patients about foot care in India and showed that unawareness of foot care increases the risk of DFUs. It seems that proper education on the cause and process of DFU can influence the understanding of patients and their attitude toward ulcers, which ultimately leads to changes in their self-care behaviors (36).

Some findings of the present study showed that foot care is not a serious issue for those who had not been diagnosed with DFU. Different studies have shown that patients have different perceptions of the importance of foot care. Manickum et al systematically investigated the global evidence on the existing knowledge about foot care practices in patients with diabetes mellitus and the areas that needed more studies. The results showed that 13% to 95% of the patients were aware of the importance of foot care (37). The literature review showed that about 32.1% of the participants were aware of the needs of diabetic patients for specialized shoes (37). These findings emphasize the need to increase the patients' awareness of the predictive factors of DFU.

Data analysis showed that the participants took certain measures such as increasing the medicine dose or using traditional treatments to prevent DFU without consulting a doctor. Nevertheless, health service providers are required to perform FDU screening tests and provide foot care training during regular patient visits (34). This finding can indicate the patient's lack of knowledge about foot screening tests or the incomplete examinations of patients in periodical visits. Taksande et al showed that foot care and complication prevention training are among the recommendations least frequently made by doctors and they devote very little time to foot care training (36).

Some participants thought DFU was inevitable, hence they were indifferent to it. In a qualitative study, Bonner et al investigated how representations of diabetes affected foot care knowledge and self-care strategies among 13 African-American diabetic adults. The results showed that most participants did not have a correct understanding of the role of uncontrolled diabetes in developing DFU (38). Nevertheless, patients will probably adopt more preventive measures if they have correct perceptions of the causes and process of DFU, the role of blood sugar management in DFU prevention, and the importance of self-care (34).

As some patients had terrible experiences with DFU, they were not even willing to remember it and preferred to ignore it. They considered DFU as equal to amputation, costly treatments, and death in the end. However, studies have shown an inverse relationship between DFU and foot care knowledge and performance of patients with diabetes (39-41). If patients have a correct understanding of the stages of ulcer formation, early risk signs, and treatment consequences of each stage, they will be more sensitive to early symptoms, seek standard care, and probably realize the importance of screening tests if the first symptoms appear.

Conclusion

The study results showed most patients do not have a correct perception of standard foot care, the etiology of DFU and its processes, and the types of preventive care and existing treatments, indicating inadequate training provided by health service providers to patients. For educating patients on standard foot care during regular visits, it is first necessary to create a good perception of and sensitivity toward DFU in patients. Different strategies, such as peer education or sharing the experiences of other patients with ulcers, can be adopted to help patients with diabetes have a correct understanding of DFU and its associated problems.

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Authors' Contribution

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Competing Interests

The authors declared no conflict of interest.

Ethical Approval

This research project was approved by the Ethics Committee of Shahrekord University of Medical Sciences (IR.SKUMS.REC.1401.103).

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