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Patient Perspective on Diabetic Foot Care

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Abstract --- *A diabetic foot ulcer is the highest complication of diabetes mellitus, it increases the amputation rate. Ignorance and mistakes of foot care cause the increase the cases of diabetic foot, but foot care based on the patient perspective and what it means have never been explored in-depth. This study used a qualitative research with a phenomenology approach aimed to explore patient's perspective about diabetic foot care at General Hospital in Gresik. Using an in-depth interview; fields note, recording; and memories note, the interview was conducted on 20 participants. Data collection was conducted by semi-structured interviews and analyzed by Braun and Clarke Thematic Analysis. The finding provides detailed information on eight main themes, that are foot care goals; urgency; area; type of care; the technique of care; education; diabetic foot prevention; and the last, consequences of an untreated foot. The conclusion is that patient's perspective about foot care means caring for the foot; skin; nail; foot form, using warm water; appropriate footwear; lotion and identification of risk factors are the important ways to prevent ulcers and amputation. In fact, the health professional does not give complete information about foot care. Finally, diabetic foot care is an important way to prevent the appearance of diabetic foot ulcers, appropriate education and information from health professionals are needed to perfect perception about diabetic foot care.*

Keywords --- *Diabetic Foot Care; Patient; Perspective*

I. INTRODUCTION

Diabetes is a common and rapidly growing chronic non-communicable disease worldwide [1]; it is a common and serious disorder and a significant risk factor for the development of cardiovascular disease, neuropathy, nephropathy, retinopathy, periodontal disease, and foot ulcers and amputations [2]. Diabetic foot ulcer is the major complication of diabetes, its incidence is about 15% [3], and every year increases in number of 15.71% on diabetic foot ulcer history [4]. As a huge problem, Diabetic Foot Ulcer will lead to amputation of lower extremities (50%) [5].

The prevalence of diabetic foot ulcer in the last 3rd decade has increased to 6.3% in the world. Asia and Europe have a 5,1-5,5% diabetic foot ulcer incidence [6] and Indonesia is the 6th highest country in this world [7]. As Ronald says, 15% of diabetes mellitus patients will have a diabetic foot ulcer [8]. Every year, >1 million people with diabetes suffer limb loss as a result of diabetes. This means that every 20 seconds, an amputation occurs in the world as an outcome of this debilitating disease [9]. The mortality rate of diabetic foot ulcer in a general hospital in Jakarta is about 16% with an amputation incidence of 25% [10]. The clinical profile of diabetic foot ulcer in General Hospital of Center Java showed foot problems

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accounted for 16.2% of total diabetic admissions [11]. An epidemiological study was conducted at an outpatient endocrine clinic in a regional hospital, eastern Indonesia and found that the prevalence of DFU risk factors was 55.4% and the prevalence of DFU was 12% [12].

A precipitating factor of a foot ulcer is peripheral blood damage and neural damage. Decreased blood flow and neuropathy will reduce leg blood flow and decrease sensation [13]. That condition is caused by uncontrolled blood sugar. The continuous increasing blood sugar, bad nutrition, irregular examinations, uncontrolled blood glucose, bad nail cutting, wearing unstandardized shoes and not doing foot assessment lead to foot ulcers [14]. Patients' behavior to maintain a healthy life is important to prevent foot ulcer. Monitoring blood sugar, diet, education, taking an activity and daily foot examination can prevent foot ulcers and amputation. The primary prevention of diabetic foot management is avoiding further damage.

Considering how important foot care and its effect are, if the patient is not familiar with foot care yet, it is important to have a holistic approach to care for the patient; one idea to be explored in-depth regards the fundamental views on patient's perspective about diabetic foot care. This research will explore the patient's perspective about diabetic foot care at the General Hospital in Gresik.

AI. METHODS

- Study Design

Using a phenomenology approach, this research was done in the general hospital of Ibnu Sina Gresik by following an ethical clearance; the ethical approval was obtained from the Health Research Ethics Committee of Faculty of Nursing Universitas Airlangga (Number: 693-KEPK). A total of 20 participants were selected by purposive sampling technique. The criteria for the participants were diabetic patient, 30-60 years old, no preexistent ulcer, good communication skills, cooperative, never been a participant and giving informed consent.

The researcher had a good relationship with the participants. The participants believed the researcher without coercion. No participants ignored the research, they voluntarily followed the study to completion. The participants have a quality; capability; and responsibility to trust and believe what they say. The interview was conducted 1-3 times in secure conditions, in a direct and indirect way (by phone on 2nd and 3rd time) and will be stopped when data is saturated.

- Data Collection

First, data on demographics and priority of patients were obtained from medical records of the hospital and validated with the participants. The researcher approached the participants by explaining the purpose of the study and obtained the consent to be interviewed.

Using an in-depth interview, a researcher used himself as an instrument and completed field notes, recording and memories note. Semi-structured interviews were used to explore information from participants. Using the first question as a guide "what is your opinion about foot care on diabetics?" the participants explained diabetic foot care based on their perspective. The researcher did not direct or purse participant to one question, but explored it in depth.

The interviews were conducted until no new themes emerged or data had been saturated. The data were digitally recorded and transcribed verbatim by the researcher, re-read, identifying, defining and naming the themes and sub-themes. The researcher used credibility, dependability, conformability and transferability to check for validity.

- Data Analysis Procedure

A thematic analysis was used to analyze the data, by identifying; analyzing, and reporting themes of data. Data analysis was carried out together with data collection, data interpretation and report writing. The verbatim transcriptions were analyzed using the Braun and Clarke Thematic Analysis approach to obtain themes as a result of research. [15] The data were analyzed using six stages: 1) familiarizing with the data, by repeatedly reading the transcripts, 2) generating initial codes, by giving a sign or code for important words or keywords and creating a category of each keyword, 3) searching for themes by grouping categories and arranging them according to the group then making sub-themes and themes, 4) reviewing themes, by checking the theme and finding a match between the extract of the data and the theme raised, 5) defining and naming themes, 6) producing the report.

Reaching the validity of the data, the researcher collected data by phone 1-3 times to make sure and reconfirm with participants which written information is correct or has to be revised.

BI. RESULTS

The demographic data showed that a small proportion (5%) are 65 years old and almost all (80%) are 45-65 years old, 60% women and 40% men, 10% highly educated (college) and almost half the participants (40%) have primary school education. The profession of the participants is housewife (40%) and only 1% as a laborer. While based on the length of diabetes, most participants were diagnosed with diabetes in the last 1-5 years (60%) and a small proportion in the past 6-10 years (5%). The demographic and specific data of participants is shown in Table 1.

Table 1. Demographic data on participants (N=20)

Number of participants	Gender	Age (yo)	Education	Profession	Length of diabetic diagnosed
1	Female	44	Senior high school	Laborer	8 months
2	Female	47	Senior high school	Housewife	1 year
3	Female	50	Senior high school	Housewife	3 year
4	Male	52	Bachelor Degree	Government employer	7 months
5	Female	46	Junior high school	Housewife	2 year
6	Male	60	Elementary school	Farmer	7 year
7	Female	64	Elementary school	Housewife	10 year
8	Male	55	Junior high school	Merchants	1 year
9	Female	59	Elementary school	Housewife	2 year
10	Male	50	Junior high school	Farmer	10 months
11	Female	63	Elementary school	Housewife	13 year
12	Female	48	Elementary school	Housewife	1 year
13	Female	51	Junior high school	Housewife	4 year
14	Male	57	Junior high school	Merchant	4 year
15	Male	68	Elementary school	No work	12 year
16	Female	61	Elementary school	Housewife	5 year
17	Male	46	Senior high school	Government employer	5 year
18	Male	53	Junior high school	Farmer	4 year
19	Female	57	Elementary school	Farmer	5 year
20	Female	42	Bachelor Degree	Government employer	5 months

The results of collecting specific data were written on a transcript. The transcript was analyzed by finding the categorical words, sub-themes and themes. The narrative was used to interpret the themes and sub-themes. This research found 8 main themes 1) foot care goal; 2) urgency; 3) area; 4) type of care; 5) the technique of care; 6) education; 7) diabetic foot prevention; and 8) consequences of an untreated foot. Twenty-two sub-themes were found.

Table 2. Thematic map showing themes, sub-themes and categories for the Diabetic Foot Care from a Patient's Perspective

Themes	Sub-Themes	Categorical
Foot care goal	Foot ulcer prevention	Avoiding ulcer
	Amputation prevention	Avoiding amputation
Urgency	Important	Important
		Needed
	Not important	Not important
Area	Nail	Cracked nails
		Ingrown nail
	Skin	Blistered skin
		Dry skin
		Broken skin
		Eyes fish skin
		Moldy skin
	Foot form	Foot deformity
Type of care	Foot care	Soak the cold foot
		Applying lotion
	Nail care	
		Cut the nail
		Wash the nail
		Soak the nail
	Using footwear	Using footwear in the house
		Using footwear when out
		Footwear is protecting from injury
		Sport shoes for footwear
		Shoes with flat heel
		Big size of footwear
The technique of care	Soak in hot water	Soak in hot water to cool the foot
		Soak in hot water for a long time
	Apply lotion	Apply lotion on foot
		Apply lotion between the fingers
Education	Not mention	Do not know at all
		Not look for information
	Never received information	No information yet
		Never given information
	Education from hospital	Never accepted the information from the hospital
		Doctor and nurses never give information
Diabetic foot prevention	Foot assessment	Knowing foot condition
		Have to look and assess
	Foot care	Washing the foot
		Cleaning the foot
		Applying lotion
	Nail care	Cutting of nail
		Do not short cut of nail
		Washing the nail
		Soak the nail if too dry
	Appropriate foot wear	Using footwear at home
	Identification of risk factor	Using footwear when out
		Shoes with flat heel
		Big size
Consequences of an untreated foot	Foot ulcer	Existing foot ulcer

Themes	Sub-Themes	Categorical
		Severe wound
	Amputation	Cut the leg Amputation
	Severe diabetes	Diabetes is getting worse Death

- Theme 1: The foot care goal

The Diabetic patients were asked "what do you think about the foot care goal?". The participants said that foot care goal is to prevent foot ulcers and amputation.

Foot ulcer prevention

The diabetic patient thinks that the goal of foot care is to prevent ulcer

Avoiding ulcer

They would mention that foot care is to avoid foot ulcer. For example:

"wooooo, yeach, for prevent the ulcer … so, that there no ulcer Mom" (P2-)

Amputation prevention

The patient believes that the goal of foot care is to prevent the amputation.

Avoiding amputation

They explained clearly that foot care is to avoid amputation. She said:

"… so, that there no amputation in my leg, it's scary…" (P4-)

- Theme 2: The urgency

The participants were asked "how do you perceive the urgency for foot care, in your own perspective?". The majority said diabetic foot care is important and needed, and just a few participants said that it was not important because diabetic foot ulcer was not present yet.

Important

Diabetic foot care is needed and important for the patient. The phrase was expressed in two categories:

Important

The diabetic patient said:

"it's importance, very importance to prevent the ulcer… if we don't do that, hiiiii…" (P12-)

Needed

Some participants said that foot care is needed. One of them said:

"… yeach… needed laaah… for healthy and no amputation. (P10-)

Not important

One of them thought that foot care was not to importance before ulcer occured. For example:

"it's not to importance, because the ulcer is not occurred yet… later if I have ulcer" (P9-)

- Theme 3: The area

In participants' perspective, the area of foot care is answered when the participants were asked "what is your opinion where the areas of foot care?"

Nail

Nail is the part of the feet that needs care. Participants said that cracked nails and ingrown nails must be assessed and cared for.

Cracked nails

Cracked nails have to be cured and cared, a participant said:

"cracked nail has to cut…" (P15-)

Ingrown nail

Perspective patients where the area is nail. Ingrown nails must be cured and cared. They said:

"… nail go inside… deformity of nail has to take… cut… cut" (P5-)

Skin

The majority of participants gave their perspective that skin was the part of the foot to be cared. A blistered skin, dry skin, broken skin, eyes fish skin, and moldy skin are signs and symptoms of diabetic foot ulcers. They said:

"the skin has to be clean. If we found a blister and dry… care it" (P10-)
"thaaaattss… eyes fish, remove it" (P17-)
"…. Moldy skin… a lot… its itchy, it has to be cure" (P18-)

Foot form

Deformity has to be assessed and cared. Participants said: "the foot… have an abnormal form… it's dangerous"

- Theme 4: Type of care

Foot care

The majority of participants gave an opinion that foot care had to be done. Soaking the foot and applying lotion are the categories of type of care. They said:

"…. I always soak my cold feet" (P11-)
"… use lotion, apply it on your skin… all your feet" (P12-)

Nail care

Nail care is a part of the foot care. Soaking; washing; and cutting nail are a categorical perspective from the participants. They said:

"if you want to care your feet… take a warm water, soak your nail, you'll find your nail more gently and moist" (P7)
"wash you nail before you cut it" (P9-)
"I usually cut my nail not to short…" (P12-)

Using footwear

They know that using footwear is important and as a type of caring. They believe that using footwear in or out of the house it to protect the foot from injury, sport shoes; big shoes; and flat heels are the best choice. These are their perspectives:

"if you have a wound… use a big shoe" (P13-)
"… do not use high heel. It's hurt" (P14-)
"…. Lhoooo, a right footwear is to protect your feet" (P6-)

- Theme 5: The technique of care

Connecting to the theme before, the technique of care is soaking in hot water and applying lotion. They said:

"…. I always soak my cold feet" (P11-)
"… use lotion, apply it on your skin… all your feet" (P12-)

- Theme 6: Education

The participants think that they were never mentioned, never received and got information from the hospital and medical staff. They said:

"… I do not know all… and not look for information" (P8-)
"I never receive information from doctor…nurse…" (P9-)

- Theme 7: Diabetic foot prevention
  In fact, the majority of the participants said that diabetic foot prevention had 5 goals; those are foot assessment; foot care; nail care; appropriate footwear; and identification of risk factors. They said:

"we have to look and know foot condition" (P7-)
"the importance thing is wash you foot, clean it, … don't forget (…eeemmm) lotion" (P9-)
"nooo… noooo high heel" (P17-)
"obesity… heavy… it's made your foot hurt" (P1-)

- Theme 8: Consequences of an untreated foot
  Participants believe that foot ulcers, amputation and severe diabetes are the consequences. They said:

"the wound… yes, the wound is existing" (P14-)
"… hiiiiii, the leg is cut… cut" (P15-)
"your glucose is increase… getting worse… than death" (P3-)

IV. DISCUSSION

This article aimed to identify foot care based on the patients' perspective. As we know, foot ulcer is a serious complication of diabetic patients. It is the main source of suffering and needs a lot of money; it is also a financial burden on the healthcare system and society in general [16]. A preventive strategy, education, multi-disciplinary treatment and close monitoring of the feet can reduce foot problems, advanced symptoms their sequelae.

The ulcer starts with trauma on feet, such as feet exposure to hard objects, shoes are too narrow or cracks in the heel area [17]. An intermittent exposure, wrong treatment and uncontrolled blood sugar cause tissue damage and the inner feet because of neuropathic, all the conditions are needed to be cared for perfectly to prevent an ulcer and infections [18]. Diabetic foot lesions frequently result from a patient simultaneously having two or more risk factors, with diabetic peripheral neuropathy playing a central role. This neuropathy leads to an insensitive and sometimes deformed foot, often causing an abnormal walking pattern. In people with neuropathy, minor trauma (e.g. from ill-fitting shoes, walking barefoot or an acute injury) can precipitate ulceration of the foot. Loss of sensation, foot deformities, and limited joint mobility can result in abnormal biomechanical loading of the foot. This produces high pressure in some areas, to which the body responds with thick skin (callus). [16]

The foot care is the main effort in preventing the emergence of foot injuries, by knowing the condition of the foot and general foot health [18]. This concept is in accordance with patients' opinion that the goal of foot care is to prevent ulcers and amputation. They said it is very important to care for the foot, because if they do not, amputation will occur.

Foot care includes prevention of foot injuries [4]. As participants said the types of diabetic foot care is foot care its self. Another perspective is nail care and using appropriate footwear. A Brazilian research in 2010 on 60 patients showed patients adherence to using an appropriate shoe regularly as recommended is only about 8.7%, 65% doing regularly foot assessment, 77% applying lotion regularly, 88% drying the foot, and 83% cutting nail as recommended [19]. Another research said that the selection of appropriate footwear and footwear behaviors at home should be discussed with the patient. Patients' understanding of these issues and their physical ability to conduct proper foot surveillance and care

should be assessed. [20]. This research is in accordance with patient's perspective about the type and technique of foot care; this includes soaking the foot; applying lotion; cutting the nail properly; soaking and washing the nail to make it softer. Other participants said that they had to use appropriate footwear, included in or outside their home; sport shoes; flat-heel shoes, and big sizes. This participants' perspective about foot care supported the statement that neuropathy or evidence of increased plantar pressures (e.g., erythema, warmth, or calluses) may be adequately managed with well-fitted walking shoes or athletic shoes that cushion the feet and redistribute pressure. People with bony deformities (e.g., hammertoes, prominent metatarsal heads, bunions) may need extra-wide or deep shoes. People with bony deformities, including Charcot foot, who cannot be accommodated with commercial therapeutic footwear, will require custom-molded shoes.[20]

The participants assume that the areas of foot care are nail, skin and foot form. This fact is in accordance with the treatment of the foot. The area of foot examination is nail, skin, plantar, skin moisture and odor [21]. Hidayat said the procedure of foot care is assessing foot area; cleaning and washing the foot with warm water, washing foot with gentle soap, drying the feet, use a light towel, drying between fingers, applying lotion on foot surface but not between fingers. Nail care is cutting nails properly and regularly, not too short and close to the skin, avoiding an existing injury. A dry nail must be soaked in warm water for about 5 minutes. [21]. Supported by other research, 87% of the eventual amputations resulted from a pivotal triggering event that is preventable; the event frequently involves a minor foot trauma such as wearing improper shoes and improper cutting of toenails. The devastating consequences of foot ulceration could be avoided in most cases. [22] This concept is in accordance with patients' statements about the procedure of foot care. They said for foot care they use hot water and lotion. But, in fact, this study found the wrong procedure and technique of foot care. The majority of participants do not know, do not mention and do not find a way to care for their feet properly. Participants use hot water to soak cold feet or tired feet and apply lotion between the toes. The wrong management of foot care happens because participants do not know about proper foot care yet. It is in accordance with the theme education. In categories, we found that medical staff never gave information regularly or never gave information at all.

This study found the consequences of an untreated foot. The participants believe that ulcers and amputation will happen if they do not care for the foot. Other opinions show that severe diabetes will occur. That way, participants offer their perspective that diabetic foot prevention is important for foot assessment, foot care, nail care, using appropriate footwear and identification of risk factors. Foot assessment means knowing the condition; as a recommendation of foot care, all patients with diabetes should have their feet inspected at every visit and every day. The examination should include inspection of the skin, assessment of foot deformities, and others [23]. In the participants' perspective, foot care consists of washing, cleaning and applying lotion to the feet, nail care consists of cutting nails properly, not too short, washing the nail, and soaking the nail if too dry.

Identifying the risk factors is important too. Approximately 80% of diabetes-related lower extremity amputations are preceded by a foot ulcer, the patient demographics related to diabetic foot ulceration are typical for patients with long-standing diabetes. Risk factors for ulceration include neuropathy, PAD, foot deformity, limited ankle range of motion, high plantar foot pressures, minor trauma, previous ulceration or amputation, and visual impairment are identified risks patients need to know. [9]. This is in accordance with patients' opinion that not using footwear make the plantar pressured as well and ulcer will occur.

V. CONCLUSION

Diabetic foot care is an important way to prevent the appearance of diabetic foot ulcers. Many perspectives of patient about diabetic foot care. Diabetic foot care is caring for the foot, skin, nail, and the form by washing and cleaning the foot, applying lotion, cutting the nail properly, using footwear properly, and identifying risk factors for diabetic foot ulcers. That strategy is important to prevent ulceration and amputation. As consequences of an untreated foot, we mention amputation and death. An interesting finding is that participants soak the feet in hot water and apply lotion between toes. They also do not know, do not mention and do not try to find out how to care for the foot, and health professionals did not give complete information. It is recommended to give education about foot care as a guide and health professionals should give complete and detailed information about foot care.

CONFLICT OF INTEREST

No conflicts of interest have been declared.

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