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Research Article

### DIABETIC FOOT CARE: KNOWLEDGE AND PRACTICES REGARDING FOOT CARE AMONG DIABETIC PATIENTS IN TERTIARY CARE HOSPITAL NAWABSHAH, PAKISTAN– A CROSS-SECTIONAL STUDY

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**Abstract:**

**Objective:** To determine the current knowledge and practices of foot care among diabetics who either attend the outpatient department or admitted in PMC hospital Nawabshah.

**Methodology:** This cross-sectional study was carried out from January 2018 to December 2018. All male and female diabetic patients with DFU were recruited with purposive sampling technique. An ordinary questionnaire was used for collection of data.

**Results:** Out of 160 patients with DFU, 112[70%] were males and 48[30%] were females. Only 26.3% of patients have "Good knowledge" about foot care. Most of patients [91.3%] didn't know that use of talcum powder between digital spaces to keep skin dry, 70% didn't know that to keep skin of the feet soft is beneficial, 83.8% were unaware about that lotion not to be applied in the interdigital spaces, majority [93.8%] were didn't know about the importance of daily change of socks, 55% of patients were unaware of cutting the nails of feet straight and with care, most of patients [79.4%] unaware of inspection of feet once a day by respondents. Good foot care practices were seen only in 51.9% of patients with DFU.

**Conclusion:** This study has shown that in our area patients with DFU have poor knowledge and practices regarding foot care.

**Key words:** Foot Care Knowledge, Foot Care Practices, Diabetic foot ulcer.

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**INTRODUCTION:**

Diabetes mellitus [DM] is main health issue in worldwide and considered to be an epidemic affecting both developed as well as developing countries. According to International Diabetes Federation [IDF] about 628.6 million will have diabetes till 2045 [1]. In our country Pakistan recently estimated prevalence of diabetes is 16.98% [2].

Among other complications of DM, the diabetic foot ulceration [DFU] is most common. About fifteen percent of patients with DM develop DFU at some stage during lifetime. [3] DFU results about 50% of all diabetes related hospitalization and about 70% of nontraumatic lower limb amputations [4], have a negative influence over their quality of life [5]. With proper education of foot care and practices the lower limb amputation can be prevented [6].

The most common risk factors of DFU are PVD, PN, walking barefoot, unsuitable footwear, poor foot cleanliness and delay in consultation to doctor [7]. The identification and modification of these non-traditional risk factors with satisfactory information of foot care and by applying that learning into training, we can diminish the rate of this deadly complication [8-9].

Currently the evidences showed that knowledge of foot care have major impact on prevention of DFU. This can be witnessed by current clinical guidelines that are used in prevention and management of DFU, and outcomes are encouraging. Current guidelines recommended yearly screening for diabetic patients with high risk of ulceration. A focused foot care education needed after identification of these high-risk patients [10]. Therefore, appropriate application of guidelines and proper education regarding foot care, can make a great change in improvements in foot care.

Though there are no randomized control trials available about the role of education alone can achieve clinically relevant reductions in DFU and

amputation incidence. Valk et al. [11] in his review, also concluded that proper education may reduce the risk of DFU and amputations, especially in patients with high risk. Study by Monami et al, [12] also confirmed that brief focused group educational program in high risk patients is effective in prevention of DFU.

Large data is available regarding the importance of foot care knowledge and practices, but data is limited in Pakistan especially Sindh province. Thus, purpose of this study was to determine the current knowledge and practices of foot care among diabetics who either attend the outpatient department or admitted in PMC hospital Nawabshah. This study will help to develop strategies regarding the prevention of DFU and will help to formulate the strategies to provide the best care for patients with diabetes, and it will decrease the burden and incidence of DFU and its lethal complications.

**MATERIAL & METHODS:**

This descriptive cross-sectional study, which included 160 patients with diabetic foot ulcer from January 2018 to December 2018. All male and female diabetic patients of age more than 18 years visited the OPD or admitted in medical wards of PMC hospital Nawabshah were recruited with purposive sampling technique. Verbal consent was obtained, and ethical approval was obtained from the ethics committee of PUMHSW Nawabshah.

Patients with non-diabetic cause ulcer e.g. road traffic accidents were excluded.

An ordinary questionnaire was used to ask about relevant questions regarding the knowledge and practice of foot care, as designed by Hasnain et al [13] that consists of 15 questions. Questions were asked by house officer/postgraduate student that was translated into Sindhi and Urdu language and was completed. There were three parts of questionnaire; first part comprises patients' demographic data including age, sex, educational level and residency;

second part consists of information related to diabetic e.g. duration of disease and previous history of foot ulcer and third part contains the different questions about preventive foot care practices. Each one of these items must be answered either with Yes or No. Each answer with yes was given one mark and answer with no was given 0 [zero] mark. The points were then more up for every of the information obtained in each of the knowledge and practice categories. If score was between 11-15, we labeled as “Good knowledge”, score 10-8 as “Satisfactory knowledge”, < 8 as “Poor knowledge” [16].

The statistical data was obtained and recorded on IBM SPSS statistics version 25. For continuous data mean + SD was used, and for categorical data, frequency and percentage were used. The association between demographic data, like age scale, gender, education level and occupation, with the level of knowledge and practice of foot care were tested by using a Chi square test. We considered significant if P value less than 0.05.

### RESULTS:

A total of 160 patients with DFU were included. The mean age was  $54.04 \pm 10.09$  years and 72 [45%] patients belonged to age group less than 50 years and 88 [55%] more than 50 years. The age range of age of the participants was 38 to 88. Demographic data is shown in Table 1.

One hundred and twelve [70] were males and 48 [30%] were females. Education level 56 [48.7%] were illiterate. Out of 48 females [43 26.9%] were housewives. Most of males were farmers 41.9%. [Table 1]

Few patients [26.3%] have “Good knowledge” about foot care. A total of 103 [64.4%] patients with DFU knew the importance of normal blood glucose level can prevent the complications of diabetes, daily washing of feet [87.5 %], drying of feet [69.4%] and wearing comfortable coat shoes [57.5%]. Most of the participants have lower score about knowledge of foot care [58.1%]. Majority of patients [30%] unaware about the use of “warm water for washing/bathing”, 20.6% were unaware about the checking temperature of water before use, most of patients [91.3%] didn't know that use of talcum powder between digital spaces to keep skin dry, 70% didn't know that to

keep skin of the feet soft is beneficial, 83.8% were unaware about that lotion not to be applied in the interdigital spaces, majority [93.8%] were didn't know about the importance of daily change of socks, 55% of patients were unaware of cutting the nails of feet straight and with care, most of patients [79.4%] unaware of inspection of feet once a day by respondents, 74.4% didn't know importance of checking the shoes from inside before use and majority were [89.4%]. Didn't know the warning signs for which consultation is needed.

Though foot care practices were seen only in 51.9% of patients with DFU. Good score was observed in some foot care practices. Majority [87.5%] were washing their foot daily, 60.6% use warm water for washing/bathing, 86.9% used to checking temperature of water before using, 75.0% used to dry feet after washing, 60.6% of participants practices daily change of socks if used, 56.9% were practicing to check the shoes from inside before use and majority [89.4%] were not walking bare foot.

The lowest scores for bad practice were observed in use of talcum powder to keep dry the interdigital areas [3.1%], only [24.4%] were keeping skin of the feet soft to prevent dryness. Using moisturizer is not a usual practice [88.1%]. 68.8% didn't practice the cut the nails straight, most of these didn't inspect the feet once a day [82.5%]. In regard to footwear, only 75.6% were wearing comfortable coat shoes. Only 36.3% of participants were consulted the according to warning signs. [Table-2]

Duration of DM had no significant association with knowledge [ $p < 0.05$ ]. Sex too was not significantly associated with knowledge and practices [ $p = 0.286$ ] regarding foot care [Table 3]. Statistically significant association observed in knowledge and practice score in rural area and urban area [ $p = 0.000$ ]. Tables 3 show association between patient characteristics with knowledge and practice, respectively. Among those who were having poor-knowledge score [56.3%], majority [56.3] were having good score of practice [ $P < 0.001$ ]. [table:2]

The age, education level and occupation shown significant association with knowledge and practices [ $p = 0.000$ ] regarding foot care. [Table-3].

**Table: 1 knowledge and practices questions about foot care.**

Foot care Questions	Knowledge [Yes]	Practices [yes]
1. Did you know/practice taking antidiabetic treatment is important in prevent complications?	103 [64.4%]	92 [57.5%]
2. Did you know/practice wash your feet daily?	43 [26.9%]	101 [63.1%]
3. Did you know/practice “warm water for washing/bathing”?	48 [30.0%]	97 [60.6%]
4. Did you know/practice to “check the temperature of water before using”?	33 [20.6%]	139 [86.9%]
5. Did you know/practice “drying the feet after washing”?	111 [69.4%]	80 [50.0%]
6. Did you know/practice “use talcum powder in interdigital spaces to keep them dry”?	14 [8.8%]	5 [3.1%]
7. Did you know/practice the “Keeping skin of the feet soft to prevent dryness”?	48 [30.0%]	39 [24.4%]
8. Did you know/practice that “lotion not to be applied in the interdigital spaces”?	26 [16.3%]	19 [11.9%]
9. Did you know/practice change the socks daily?	10 [6.3%]	27 [16.9%]
10. Did you know/practice “trim nails of feet straight with care”?	72 [45.0%]	50 [31.3%]
11. Did you know/practice “inspect feet once a day by respondents”?	33 [20.6%]	28 [17.5%]
12. Did you know/practice “wear comfortable coat shoes”?	71 [44.4%]	39 [24.4%]
13. Did you know/practice “check the shoes from inside before use”?	41 [25.6%]	91 [56.9%]
14. Did you know/practice “walk bare foot”?	136 [85.0%]	17 [10.6%]
15. Did you know/practice “warning signs for which consultation is needed”?	16 [10.0%]	58 [36.3%]

**Table-2: Knowledge and practices score.**

Grade				
Good [11-15]	32	20.0	28	17.5
Satisfactory [8-10]	37	23.1	29	18.1
Poor [less than 8]	91	56.9	103	64.4
Total	160	100.0	160	100.0

TABLE 3. Impact of patient characteristics on knowledge

	Foot care knowledge				Foot care practices			
	Good	Satisfactory	Poor	p-value	Good	Satisfactory	Poor	p-value
<b>Age</b>								
Less than 50	20.8%	33.3%	45.8%	0.000	40.3%	12.5%	47.2%	0.000
More than 50	13.6%	11.4%	75.0%		1.1%	22.7%	76.1%	
<b>Sex</b>								
Male	17.9%	25.0%	57.1%	0.133	20.5%	15.2%	64.3%	0.286
Female	14.6%	12.5%	72.9%		14.6%	25.0%	60.4%	
<b>Residency</b>								
Rural	32.1%	26.4%	41.5%	0.000	39.6%	7.5%	52.8%	0.000
Urban	18.7%	17.8%	63.6%		6.5%	23.4%	70.1%	
<b>Education level</b>								
Educated	39.0%	33.9%	27.1%	0.000	50.8%	11.9%	37.3%	0.000
Uneducated	4.0%	13.9%	82.2%		0.0%	21.8%	78.2%	
<b>Occupation</b>								
Farmer	4.5%	18.2%	77.3%	0.000	3.0%	25.8%	71.2%	0.000
Housewife	11.6%	11.6%	76.7%		16.3%	25.6%	58.1%	
Govt: Job	39.5%	36.8%	23.7%		52.6%	0.0%	47.4%	
Laborer	12.5%	12.5%	75.0%		0.0%	0.0%	100.0%	
Landlord	100%	0.0%	0.0%		0.0%	100.0%	0.0%	
<b>Duration of Diabetes</b>								
> 10 years	17.9%	20.0%	62.1%	0.120	14.7%	13.7%	71.6%	0.066
<10 years	30.8%	21.5%	47.7%		21.5%	24.6%	53.8%	

**DISCUSSION:**

The results of our study showed that 55% of diabetic patients were aged > 50 years, and male were more than females, finding similar to other studies [10, 16-19]. Most of these participants were illiterate. This finding was similar to other national [13] and international studies [16-19]. Study in Pakistan found more literate patients 91.1% [16] that was conducted in Punjab province of Pakistan that have high literacy rate as compared to Sindh. The highest proportion of diabetic patients was from rural areas; this was contrary to other studies [8, 20], where they noted more population belongs to urban areas. Location of study may be possible explanation of this variability, our research was conducted tertiary care hospital that covers most of rural areas of Sindh, Pakistan.

Our study discovered that 59.4% of patients have their diabetic duration less than  $\leq 10$  years, this finding was found in other researches [16, 19-21].

The results of our study showed that only 23.1% of diabetic patients had good foot care information and most of these were had underprivileged of foot care knowledge. Results of other national and international studies are variable. Almost same results noted in Lahore Pakistan [13] that noted 29.3% have good information. Shrestha et al. [10] noted 23.98% have poor knowledge score. Another study in Saudi Arabia [22] noted that 46.4% of the Jizani population had poor knowledge of foot care. This finding is consistent with the study done in Tanzania [8]. Study in India noted only 11.6% patients had poor knowledge of foot care [23].

Most of participants [87.5%] in our study were well aware of washing their feet daily, not waking bare foot [85%] and drying of their feet [69.4%]. These findings are consistent with other studies conducted in Pakistan, Saudi Arabia and in Iraq [13,14,17], this practice is common in these countries and our country because every Muslim was their feet before prayer.

Very poor knowledge about foot care observed in our study about “using warm water for washing/bathing, checking temperature of water before use, use of talcum powder in interdigital spaces to keep them dry”, keeping skin of the feet soft to prevent dryness, lotion not to be applied between digital spaces, daily change of socks, cutting of nails of feet straight and with care, daily inspection of feet by caregiver, before use of shoes check them from inside and warning signs for ulceration in which consultation is necessary. All these factors are very important in prevention of DFU. Study in Malaysia [24], the most of participants were unaware that foot should be washed daily with warm water, check of temperature before washing feet, and use of moisturizer. The study by Kafaie et al. [25] conducted in Iran, another Muslim country, the majority were not knowing the importance of washing their feet, daily foot inspection, cutting nail using a blade, and not using moisturizer on feet.

In our study the age scale [ $p < 0.008$ ], residency, education status [ $p < 0.000$ ] and occupation [ $p < 0.000$ ] imposed significant impact on knowledge score. Similar findings were reported by Kide et al in 2014 [26], Pitchai in 2015[27] and Saber at al. in 2018 [28], also observed the higher knowledge score among patients belongs to urban areas as compared to rural areas, and this might be explained by that these groups were more educated and had more health facilities. Other studies also confirmed the relationship of education and age scale with knowledge [12,15,19,26-28]. Education have major impact on knowledge, so educated patients are able understand and read the valuable information and to take care of their own health compared to illiterate patients.

We didn't observe the association of sex with knowledge, same results found by other studies [13,22,24], but results were contrary in India [29] where study noted low scores for foot care knowledge were observed in females [78.5%] than in men [62.5%]. More females with low educational status may be possible explanation.

The use of cream or lotion for moisturizing the skin can restore skin softness and elasticity by improving cell hydration [19]. The moisturizing skin of the foot was observed in 33.3%. It is almost similar to that in Saudi Arabia 31.4% [30]. The use of cream or lotion over body unusual practices seen in our country and in Saudi moisturization seen as shameful act, or they thought the moisturizing of skin is a cosmetic act [30].

Poor [51.9 %] preventive foot care practices were found in our study, similar practices were observed in other national or international studies [13, 24-26,30]. About half [57.5%] of patients were taking regular use of Anti-diabetic drugs. Good practices were seen in daily wash of their feet [87.5 %], use warm water for washing/bathing [60.6%], checking temperature of water before using [86.9%], drying of feet after washing [75%], daily change of socks if used [60.6%] and walking bare foot [89.4%]. These practices commonly seen in our study because of environmental conditions [high temperature in our area] and as Muslim country, they have to wash their feet every time before praying owing to religious practice. Same findings observed in other studies [17,24,30] These practices are essential to prevent foot injuries and further complications [17], same findings also noted in Jordan [18]. Our study observed that patients didn't practice use of talcum powder between interdigital spaces to keep them dry, straight cutting of nails of feet and with care, checkup of feet once a day by caregiver, checking the shoes from inside before use and warning signs for which consultation is routinely required. All these factors are also very important for preventive measures of DFU. Study in Makkah Saudi Arabia noted that almost 96.3% of the study subjects wash their feet regularly, 76.9% of subjects inspected their feet and 37.7% of them examine feet daily [31]. Study in Southern India noted 70% of the patients with diabetes take care of their feet through regular washing [23]. Islamic rituals may be possible explanation of these differences. Solan et al [22] noted inadequacies of foot care in; inspection shoes inside [23.8%] and wearing shoes without socks [29.6%].

The moisturizing the feet with lotion was observed only in 11.9 %. Study in Saudi Arabia noted 31.4% [30], in Iraq 33.3% was noted [19]. In our region application of lotion for moisturizing the feet is not common practice. Our study revealed that 31.3 % of diabetic patients not practice the proper trimming of nails of toes, consistent with study conducted in Jordan [18] but contrary with study conducted in Pakistan [16]. The poor foot care practices may be due to dearth of proper knowledge of foot care among the patients with DFU.

Our study noted that majority [89.4%] of patients practicing wearing the shoes and only 10.6% patients walk bare feted. Study in Saudi [30] noted that 34.0% of their patients walk bare feted another study in India noted 87.3% of patients walk bare feted [23]. These studies study the use of shoes inside home on

contrary to our study where we study the use of shows outside home may be possible explanation.

Some studies observed moderate score in foot care practices [29,37] but limited data is available that showed good foot care practice in diabetic patients. One study in India noted 67% of patients with diabetes had good foot care practice score [23].

We observed that age scale [ $p < 0.000$ ], residency [ $p < 0.000$ ], education status [ $p < 0.000$ ] and occupation [ $p < 0.000$ ] imposed significant impact on foot care practices. The significant association of education with foot care practices were observed by other studies [13,17]. Study in Makkah [30] also found significant association between foot knowledge and foot care practices [ $p$ -value  $< 0.05$ ]. Gowda et al. [21] observed significant association between level of knowledge and occupation [ $p = 0.01$ ]. Another in Jordan [18] also revealed significant associations between level of education and knowledge [ $p < 0.001$ ] as well as practice [ $p < 0.006$ ].

### CONCLUSION:

This study has shown that in our area patients with DFU have poor knowledge and practices regarding foot care. This exposes the available primary and secondary health care facilities in our region. Foot care education and other healthcare facilities for diabetes is critical tool for preventing lower leg amputation. There is a need for awareness program for these patients and well structured educational programme can lead to improved foot care knowledge; self-care practices, thus it will reduce the incidence of DFU. There is an urgent need to establish more diabetic centers to improve patients' knowledge of risks and foot self-care practices.

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