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EVALUATION OF FOOT CARE KNOWLEDGE AND PRACTICES AMONG DIABETIC PATIENTS ATTENDING JAZAN DIABETIC CENTRE, JAZAN, KSA: A CROSS-SECTIONAL STUDY

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Abstract:

Background: *Diabetes Mellitus (DM) is one of the most challenging health problems in developing and developed world. It impacts all aspects of the body, including the feet. It usually starts with a small ulcer and progresses to a lethal gangrene, which may eventually require amputation and may end up with septicemia or death.*

Objectives: *To evaluate the knowledge and practices regarding foot care among people with diabetes attending Jazan diabetic center and determine the Wrong behavior, as well as stress upon the importance of such knowledge and practices in decreasing morbidity associated with diabetic foot disease.*

Design: *Diabetic Center Based descriptive, Cross-sectional Study.*

Setting: *Diabetic Center, Jazan, Saudi Arabia.*

Method: *Direct questionnaire on 132 participants who meets the inclusion criteria using 9.5% proportion of DM among population with 95% confidence interval and 5% margin of error under WHO software for sample size determination.*

Main outcome measures: *Good level of knowledge about foot care, with one third of young respondents found to have good practice of foot care.*

Results: *The results showed most of respondent had better level of knowledge about foot care as compared to prior studies. Despite good knowledge about foot care, only one third were found to have good practice of foot care, young respondents in their second and third decades significantly had better level of practice compared to those aged sixty or older.*

Conclusions: *We found three-quarter of people with DM are knowledgeable about foot care, but one third of them well practiced foot care; these were associated with older age and poor economic status. Findings highlights gaps in practice of foot care and necessitate devoting rigorous efforts in educating diabetic patients about the importance of foot care through educational programs and routine counseling to minimize the odds of developing diabetic foot and associated problems.*

Limitations: *This study has some limitations, the cross-sectional nature of the study; we couldn't assess the difference in clinical outcomes in relation to knowledge and practice levels. Also, the sample was not representative of all geographical zones of Jazan region so the findings may not be enough to apply on all population.*

Key words: *Diabetic Foot; Knowledge; Care; Diabetic Center; KSA.*

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INTRODUCTION

Diabetes Mellitus (DM) is one of the most challenging health problems in both developing and developed world.[1] Worldwide, the prevalence of DM is nearly 3%, with an expected increase to more than 4% in 2030.[2] In the western world approximately 10% have Type 1 and 90% have Type 2 DM. It impacts all aspects of the body, but adversely focuses on the feet. It is start with small ulcer and advance to lethal gangrene that finishes either with amputation, septicemia or death, that's what called a diabetic foot syndrome .[3]. It is the most incessant reason for hospitalization for patients with diabetes, up to 25% of all diabetic admissions and %85 of non-traumatic lower limb amputation.[4] The risk of diabetic foot syndrome increments by two to four folds with old age, diabetic duration, type and presence of peripheral neuropathy and Peripheral vascular disease, Foot care awareness in a primary care for diabetic patient improves their foot care practice and decrease the risk foot ulcer.[5] Foot disease is frequently a slow-to-develop, painless and is the most devastating among all chronic complications affecting patients with diabetes, may lead to long hospital stay, disabilities and burden on the health care system and families. As the prevalence of diabetes especially type 2 increases globally, and more rapidly in the developing world, primarily owing to demographic and socioeconomic changes, more diabetic foot disease may be expected. The prevalence of foot ulceration among patients with DM ranges from 1.3% to 4.8% in the community, to as high as 12% in hospital.[6] Realizing the importance of diabetic foot problems, IDF also chose the theme of World Diabetes Day in 2005 “Put Feet First, Prevent Amputations.”[7] Better understanding the knowledge and practices regarding foot care of their patients in a community as foot care practices are different in different communities, and the Information gained through this can help to adopt foot-specific patient education, thus managing patients in a better way. Regarding foot care of our patients as foot care knowledge and practices are different in different communities, will increase our knowledge about the issue and will help us as health care provider to refine our knowledge on management and to adopt foot-specific patient education, thus managing our patients in a better way that may help to reduce mortality, morbidity, long hospital stay and burden on health care system and families.

MATERIALS AND METHODS:

Study place, design and participants

This is a descriptive cross-sectional Study. The study was conducted in Jazan Diabetic Center in the city of Jazan which is located at the southern-west of Saudi Arabia. The study was targeted to Diabetic patients of Jazan's diabetic center those who are known cases of Type 1 and Type 2 diabetes, aged between 25 to 65 years, had the disease for at least six months duration, attending the diabetic center will be eligible to be included as participants in this study excluding patients with current or previous foot ulceration, Participants having cognitive impairment and obvious disability that could affect independent self-care behavior and females who are pregnant or nursing.

Sampling Procedures

The sample size was 132 using 9.5% proportion of diabetes mellitus among general population with 95% confidence interval and 5% margin of error under WHO software for sample size determination. A non-probability convenience sampling technique was used.

Data collection Procedure

All type 1 and type 2 diabetic Patients fulfilling the inclusion and exclusion criteria attending the Jazan diabetic center for routine follow-up were enrolled in the study. Jazan Diabetic Center is a specialized center providing day cares services to all diabetic patient situated in Jazan city. The outcomes variables of this study were knowledge and practices regarding foot care in diabetic patients. Approval from ethical committee of Jazan Diabetic Center and Jazan Medical College was obtained prior to initiation of the study and was enrolled only those participants who can give written or verbal consent. Collected data after a detailed history, was including participants demographic characteristics as age (years), gender, education level and details of disease and treatment among the study participants such as age at first diagnosis of diabetes, duration of DM in years, medication and Glycaemic control. The questionnaires applied in the study included the participants demographic details, the foot care knowledge and Practices questionnaire adapted to the local sociocultural context, and prepared based on a review of the Nottingham assessment of functional foot care questionnaire (Lincoln et, al. 2007), American college of foot and ankle surgeons (ADA 1998) and the Diabetes UK (Pollock et, al.2004). The questionnaires were in English and translated into local Arabic language for clarity purposes, and were pre-tested on 20 patients, who were excluded from

the study group. The questions asked were closed ended and consist of 11 questions on knowledge and foot care current self-care practices respectively and each correct answer was assigned one mark. The participant score regarding foot care knowledge and practices as assessed by pretested questionnaire was graded as good, satisfactory and poor if score is ≥70% (8-11), 50-69% (6-7) and 50% (≤6), respectively.

RESULTS:

A total of 132 participants agreed to take part in this study. Seventy (53.0%) of them were females and the majority (87.9%) were Saudi. Forty respondents (30.3%) belonged to age group 46─55 years; more than one-third (34.8%) had a higher level of education; and 27.3% were employed. Regarding job status of female respondents, more than one-third (34.8%) were housewives. The majority of respondents (44.7%) had a monthly income of more than 3000 SR. Sociodemographic characteristics of study participants are describes in Table 1.

Table 1 Sociodemographic characteristics of study participants (N=132)

Sociodemographic characteristics	*n* (%)
Sex	
Male	62 (47.0)
Female	70 (53.0)
Age group (in years)	
18─25	14 (10.6)
26─35	13 (9.8)
36─45	21 (15.9)
46─55	40 (30.3)
56─65	28 (21.2)
Older than 65	16 (12.1)
Nationality	
Saudi	116 (87.9)
Non-Saudi	16 (12.1)
Educational level	
Illiterate	38 (28.8)
Under matric	22 (16.7)
Matric	26 (19.7)
Higher	46 (34.8)
Job status*	
Student	9 (6.8)
Unemployed	11 (8.3)
Employed	36 (27.3)
Retired	26 (19.7)
Unable to work	3 (2.3)
Housewife	46 (34.8)
Monthly income (in SAR)*	
Less than 1000	24 (18.2)
1001─2000	24 (18.2)
2001─3000	16 (12.1)
More than 3000	59 (44.7)

* The total percentage does not add to 100% because of missing values. SAR: Saudi Riyal.

As shown in Table 2, 50.8% of respondents had type 2 DM, with the majority of them reported a positive family of DM (80.3%) and were diagnosed at age 45 or less (63.6%). The duration of having DM was more than five years in 74.2% of respondents. Regarding medication type, 36.4% used insulin alone, 31.8% used oral hypoglycemic alone, and 29.5% used a combination of the two. DM was adequately controlled (HbA1c level: 6% or less) in 43.9% of respondents, with a considerable proportion (29.5%) having a poorly controlled DM (HbA1c level: more than 7.7%).

Table 2 Clinical characteristics of study participants (N=132)	
Clinical characteristics	*n* (%)
Age at first diagnosis (in years)*	
45 or less	87 (63.6)
More than 45	45 (34.1)
Type of DM*	
Type 1	57 (43.2)
Type 2	67 (50.8)
Duration of DM (in years)*	
Less than 5	33 (25.0)
More than 5	98 (74.2)
Family history of DM	
Yes	106 (80.3)
No	26 (19.7)
Medication*	
Diet only	2 (1.5)
Oral hypoglycemic	42 (31.8)
Insulin	48 (36.4)
Combined (oral hypoglycemic with insulin)	39 (29.5)
Glycemic control (%HbA1c level)	
Tight (6% or less)	27 (20.5)
Adequate (6.1% ─7.7%)	58 (43.9)
Poor (more than 7.7%)	39 (29.5)
* The total percentage does not add to 100% because of missing values. DM: Diabetes mellitus.	

We asked participants to answer 11 questions to examine the level of their knowledge about foot care in patients with DM. As displayed in Table 3, the vast majority of responses were true. For example, 97.7% were aware of the importance of compliance with DM medications; 96.2% were aware of the importance of taking care of their feet and regular follow-up with their physicians; and 87.1% were aware of the importance of washing their feet on daily basis. However, only 57.6% of respondents were aware of the importance of seeking advice from their physicians before they buy new shoes and only 52.3% were aware of the importance of knowing the temperature of the water they should wash their feet in.

Table 3 Examining participants' knowledge about foot care (N=132)	
Knowledge	*n* (%)*
Diabetic patients should take their medication regularly because they are liable for diabetes complication.	129 (97.7)
Diabetic patients should inspect footwear every time before wearing.	109 (82.6)
Diabetic patients should look after their feet regularly as they may not feel minor injury to their feet.	124 (93.9)
Diabetic patients should look after their feet regularly because their wound may not heal quickly once they get an ulcer.	127 (96.2)
How often you know your feet should be washed daily.	115 (87.1)
Diabetic patients should seek advice from their doctor before they buy their shoes.	76 (57.6)
Diabetic patients should check shoe material as hard or soft before they buy their shoes.	105 (79.5)
Is it important that a diabetic should know the temperature of the water he/she should wash their feet in?	69 (52.3)
Do you know that diabetics should not smoke as smoking causes poor circulation that affect their feet?	107 (81.1)
Is it important that diabetic patients should dry their feet after washing?	91 (68.9)
Diabetic patients should do regular follow-up and consult their physician on regular basis.	127 (96.2)
* Frequencies and percentages displayed in this table correspond to true responses.	

We asked participants to answer 11 questions to examine their practices of foot care in patients with DM. As displayed in Table 4, in only five items the majority of responses were true. For example, 89.4% did wash their feet daily; 85.6% took care of their nails; and 62.9% checked their footwear from inside before wearing them. On the other hand, only 42.4% used flat heel shoes every time they go outside house and only 44.7% kept their feet moist through daily use of oil and lotion.

Table 4 Examining participants' practices of foot care (N=132)

Practice	*n* (%)*
Do you examine your feet daily?	75 (56.8)
Do you wash your feet regularly?	118 (89.4)
Do you do foot massage regularly?	71 (53.8)
Do you cut your nails straight and with care?	113 (85.6)
Do you keep dry your feet after washing?	82 (62.1)
Do you use oil / lotion daily on feet to keep the feet soft to prevent dryness?	59 (44.7)
Do you prefer to use open shoes in regular use?	93 (70.5)
Do you walk bare feet in the house and nearby surroundings?	62 (47.0)
Do you use flat heel shoes while you go outside the house every time?	56 (42.4)
Do you check footwear from inside before wearing?	83 (62.9)
Do you clean nails with a sharp object?	61 (46.2)

* Frequencies and percentages displayed in this table correspond to true responses.

Table 5 shows the total score of participants on knowledge (11 items) and practice (11 items) of foot care in patients with DM. Regarding knowledge, three-quarters (75.0%) of respondents had a good level of knowledge about foot care (correct responses ≥70%). Regarding practice, the majority 41.7% had a satisfactory level of practice of foot care (correct responses = 50-69%), with a significant proportion (22.7%) having a poor level of practice (correct responses = 50%). These findings collectively indicate that respondents in our study are well-knowledgeable about foot care in patients with DM though one in every five has a poor level of practice of foot care.

Table 5 Scoring of knowledge and practice of foot care among the respondents (N=132)

Scoring (out of 11)	Knowledge *n* (%)	Practice *n* (%)
≥70% (Good) (8-11)	99 (75.0)	40 (30.3)
50-69% (Satisfactory) (6-7)	17 (12.9)	55 (41.7)
50% (Poor) (≤6)	11 (8.3)	30 (22.7)
Total* N (%)	127 (96.2)	125 (94.7)

* The total percentage does not add to 100% because of missing values.

As Table 6 shows, age was significantly associated with practice (*P*=.02) but not with knowledge about foot care. Higher income was significantly associated with higher level of knowledge (*P*=.000) but not with level of practice of foot care. There was no statistically significant difference in sex and educational level regarding levels of knowledge and practice of foot care (all *P* values >0.05).

Table 6 Relationship between level of knowledge and practice of foot care with sex, age, educational level, and income of respondents (N=132)

Variable	Knowledge level			Practice level		
	≥70% (Good)	50-69% (Satisfactory)	50% (Poor)	≥70% (Good)	50-69% (Satisfactory)	50% (Poor)
	Sex					
Male	44 (73.3)	10 (16.7)	6 (10.0)	17 (29.3)	27 (46.6)	14 (24.1)
Female	55 (82.1)	7 (10.4)	5 (7.5)	23 (34.3)	28 (41.8)	16 (23.9)
Chi-square	1.461			0.406		
P value	0.48			0.82		
Age group (in years)						
18–25	13 (92.9)	1 (7.1)	0 (0.0)	0 (0.0)	13 (92.9)	1 (7.1)
26–35	10 (76.9)	2 (15.4)	1 (7.7)	6 (46.2)	5 (38.5)	2 (15.4)
36–45	15 (78.9)	2 (10.5)	2 (10.5)	8 (42.1)	7 (36.8)	4 (21.1)
46–55	32 (86.5)	2 (5.4)	3 (8.1)	13 (37.1)	12 (34.3)	10 (28.6)
56–65	19 (67.9)	6 (21.4)	3 (10.7)	11 (39.3)	10 (35.7)	7 (25.0)
≥65	10 (62.5)	4 (25.0)	2 (12.5)	2 (12.5)	8 (50.0)	6 (37.5)
Chi-square	8.618			21.440		
P value	0.57			0.02		
Educational level						
Illiterate	25 (69.4)	8 (22.2)	3 (8.3)	10 (26.3)	13 (34.2)	15 (39.5)
Under matric	17 (77.3)	3 (13.6)	2 (9.1)	9 (40.9)	11 (50.0)	2 (9.1)
Matric	19 (82.6)	2 (8.7)	2 (8.7)	7 930.40	10 (43.5)	6 (26.1)
Higher	38 (82.6)	4 (8.7)	4 (8.7)	14 (33.3)	21 (50.0)	7 (16.7)
Chi-square	3.772			9.135		
P value	0.71			0.17		
Monthly income (in SAR)						
<1000	15 (65.2)	6 (26.1)	2 (8.7)	5 (21.7)	11 (47.8)	7 (30.4)
1001–2000	21 (87.5)	3 (12.5)	0 (0.0)	5 (21.7)	12 (52.2)	6 (26.1)
2001–3000	5 (33.3)	5 (33.3)	5 (33.3)	3 (21.4)	7 (50.0)	4 (28.6)
>3000	50 (87.7)	3 (5.3)	4 (7.0)	23 (39.7)	24 (41.4)	11 (19.0)
Chi-square	26.658			4.838		
P value	0.000			0.57		

DISCUSSION:

The aim of the present study was to examine knowledge and practice of foot care among diabetic patients in Jazan Province. The analysis showed that most of respondents (75.0%) had a better level of knowledge about foot care as compared to prior studies. However, despite good knowledge about foot

care, only 30.3% were found to have good practice of foot care in our study, which is consistent with what was reported by several studies from around the world.[8]

Knowledge alone is not enough if it is not combined with practice in real life. The finding that a high proportion of respondents in this study (22.7%) poorly practiced foot care may indicate lack of awareness about the importance about foot care. For example, the analysis showed that 96.2% of respondents correctly answered the question about the importance of regular self-examination of foot, but only 43.2% did so. Moreover, possible ignorance about the importance of applying knowledge in real life could in part, explain why as much as 29.5% of respondents in our study had poorly controlled DM (HbA1c>7.7%).

In fact, lack of daily use of oil or lotion to protect feet from dryness, walking barefoot, and incorrect toenail care were all found in a significant number of respondents and they are known to directly increase the likelihood of developing foot problems.[9] These findings necessitate hard efforts to routinely educate people with diabetes about the importance of foot care practice as the deficiency in practice may be due to poor doctor-patient relationship.[10]

We found that people with low monthly income to be significantly less knowledgeable about foot care than those with higher income. Also, illiterate and older respondents (≥65 years) were found to have lower, though not significant, levels of knowledge when compared to educated and younger respondents. These findings are in agreement with previous studies from India, Pakistan, and Iran.[8]

Regarding practice of foot care, young respondents (26─35 years) significantly had better level of practice (46.2%) compared to those aged 65 or older (12.5%), which is consistent with previous studies.[12] This could be attributed to the fact that younger respondents have higher levels of education, and hence are more likely to practice good foot care as they can read and understand educational materials and obtain information about the disease using internet.[11]

LIMITATIONS:

This study has some limitations. Firstly, due to the cross-sectional nature of the study, we could not assess the difference in clinical outcomes in relation to knowledge and practice levels. Thus, adopting a longitudinal prospective design is recommended in future works. Secondly, given that our sample was not representative of all geographical zones of Jazan region, our findings may not generalize to all Jazani population and should be interpreted with caution.

CONCLUSION:

We found that three-quarters (75.0%) of people with DM to be well knowledgeable about foot care. However, only 30.3% well practiced foot care; these were associated with older age and poor economic status. These findings highlight the gaps in practice of foot care in patients with DM and necessitate devoting rigorous efforts in educating diabetic patients about the importance of foot care practice through educational programs and routine physician counseling to minimize the odds of developing diabetic foot and associated problems.

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