

Original Research Article

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Awareness of diabetic foot disease among patients with diabetes mellitus in Al-Ahsa Saudi Arabia

Abdulaziz S. Aldhafar^{1*}, Mohamed Abdalla¹, Abdulaziz K. Althafar²

¹Department of Surgery, King Fahad Hospital Hofof, Saudi Arabia

²Department of Medicine, King Fahad Hospital Hofof, Saudi Arabia

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***Correspondence:**

Dr. Abdulaziz S. Aldhafar,

E-mail: azizdhafar@gmail.com

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ABSTRACT

Background: The prevalence of diabetes mellitus (DM) in Saudi Arabia is 18.3% in 2020. One of the most common complications that affects diabetic patients is diabetic foot disease (DFD). Patient education is the most effective way to reduce the complications of DFD.

Methods: A cross-sectional study was conducted in the period from January to May 2021. A pretested standardized questionnaire was used to collect information upon knowledge, attitude and practice toward diabetic foot care. Data entry was performed using SPSS.

Results: The responses of 480 of which 294 male and 186 female, 41.6% have high school degree, 19.3% have bachelor's degree and 2.2% have master or Ph. D. degree. The mean age of the respondents was 47 years. The 58% of the participant agreed that they might develop reduce flow to their feet. half of the participant were not aware that smoking can reduce blood flow in their feet. There were only 2.3% of the respondents attended a class on how to care of the foot. Participants who received information about foot care from a nurse and physician were 23% and 9.2% respectively. The 97.5% of the participant would like to know how to care for their foot. 75.8% of participants walk barefoot and 42.2% use a comfortable coated shoe.

Conclusions: Participants have inadequate knowledge, attitude and practice about DFD. providing a structured educational program about diabetic foot care has significant impact on diabetic patient to improve their knowledge and practices and to motivate them to have a positive attitude toward diabetic foot care.

Keywords: DM, Diabetic foot, Foot care, Knowledge

INTRODUCTION

Diabetes mellitus (DM) is a chronic, metabolic disease characterized by elevated levels of blood glucose, that might lead to serious damage to the heart, blood vessels, eyes, kidneys and nerves. The world health organization (WHO) estimates that about 422 million people worldwide have DM, the majority living in low-and middle-income countries, and 1.6 million deaths are directly attributed to diabetes each year. its prevalence is growing over years where its prevalence increased from 108 million in 1980 to 422 million on 2014.¹

Saudi Arabia is one of the 21 countries and territories of the international diabetes federation Middle East and North Africa (IDF MENA) region, the prevalence of DM in Saudi Arabia is 18.3% in 2020.^{1,2}

One of the common and disquieting complications that affects diabetic patients is DFD.³ DFD comprises a constellation of vascular and neurological pathologic changes that are the direct result of DM, causing local tissue destruction by sensory neuropathy and compromise of the vascular system of the affected lower extremities of diabetic patients.⁴ Major risk factors for development of foot problems in diabetics include smoking, old age,

diabetes for longer than 10 years, uncontrolled diabetics, history of previous foot ulcers or amputations, poor foot care, co-existing diseases such as peripheral neuropathy with loss of protective sensation, bone deformities, peripheral vascular disease, nail pathologies can further increase the risk.⁵⁻⁷

Early identification of DFD and diabetic patient's awareness of DFD and how to take care of it will reduce the incidence of more complications like amputation.^{8,9}

Patient education is the most effective way to reduce the complications of DFD. as the patient is the primary foot care taker, good awareness and practice of foot self-care is essential to reduce the incidence of DFD.¹⁰⁻¹⁴

Since there is a lack of population-based studies available on awareness and practice of diabetic foot self-care in eastern region of Saudi Arabia, this study was conducted to assess the level of awareness of DFD amongst patients with DM and evaluating their knowledge, attitudes and practices concerning DFD.

METHODS

A cross-sectional study was conducted in Al-Ahssa, Kingdom of Saudi Arabia in the period from January to May 2021. Patients diagnosed with type 1 and type 2 diabetes aged ≥ 15 years were selected randomly to join the study in order to assess their knowledge, attitude and practice about DFD. A standardized questionnaire was used to collect information upon knowledge, attitude and practice toward DFD. The set of closed type questions were developed from the literature review of similar objectives.¹⁵⁻¹⁸ The questionnaire consisted of three sections: (i) socio-demographic data, (ii) knowledge and attitude toward diabetic foot care, and (iii) practice of diabetic foot care. The questionnaire was pre-tested and translated into Arabic language and then back-translated to English to validate the translation. verbal informed consent was obtained. Ethical approval for this study was obtained from (the human ethical committee). Sample technique used is simple random sampling. 480 were enrolled in the study. Data entry was performed using the statistical package for social sciences SPSS Version 24 software.

RESULTS

Four hundred and eighty participants were included in this study, all of them from Al-Ahssa city which is located in the eastern region in Saudi-Arabia.

Demographic data

The total of 480 person participated in the study of which 294 (61.3%) male 186 (38.7%) female. The mean age was 47 years, 268 (55.8%) in urban area and 212 (44.2%) in rural area. Out of the total participants, 41.6% have high school degree, 19.3% have bachelor degree, 2.2%

have master or Ph.D. degree. More than half of patients (57.5%) had diabetes for more than 10 years (Table 1).

Table 1: Demographic characteristics.

Characteristics	N (%)
Gender	
Male	294 (61.3)
Female	186 (38.7)
Age (years)	
Less than 30	15 (3.1)
30-39	66 (13.7)
40-49	112 (23.3)
50-59	184 (38.3)
More than 60	103 (21.4)
Education level	
Not educated	176 (36.6)
High school	200 (41.6)
Bachelor degree	99 (20.6)
Master or Ph. D.	5 (1.2)
Duration of diabetes (years)	
1-5	96 (20)
6-10	166 (34.5)
More than 10	218 (45.4)

Knowledge and attitude about diabetic foot

The 58% of the participant agreed that diabetic patient may develop reduce flow to their feet, 63% replay that they may develop lack of sensation in their feet and 60% agreed that they may develop foot ulcer, majority of the participant (81%) were aware that they may develop lower limb gangrene, half of the participant were aware that smoking can reduce blood flow in their feet. Majority of the respondents (82.7%) agreed that loss of sensation in their feet increase the risk of diabetic foot, 76.2% of the participant respond positively that reduce blood flow in their feet increase the risk of diabetic foot and 55.5% for foot infection. 70.5% agreed that controlling blood sugar reduce the risk of diabetic foot. There were only 2.3% of the respondents attended a class on how to care of the foot. Only 9.2% received information about foot care from a nurse, 23% from a physician. there were only 3.3% received information while waiting to see the doctor. More than 80% have not read ever read any hand-outs on feet care. 97.5% of the participant would like to know how to care for their foot (Table 2).

Practice of diabetic foot care

The 61% of the participant inspect their feet daily, majority of the participant wash their feet daily (97%), trim toenails straight and file edges (83.9%), walk barefoot (75.8%) and protect their feet and keep them away from hot and cold temperature (62.3%). There were about 51.4% dry their feet and between the toes after washing, 56.6% apply moisturizer on their feet. Only 42.2% use a comfortable coated shoe and 50.8% inspect the shoes before wearing them (Table 3).

Table 2: Knowledge and attitude about diabetic foot.

Variables	Yes, N (%)	No, N (%)
Diabetic patients may develop reduced blood flow in their feet	282 (58.7)	198 (41.2)
Diabetic patients may develop lack of sensation in their feet.	304 (63.3)	176 (36.7)
Diabetic patients may develop foot ulcers	288 (60)	192 (40)
Diabetic patients may develop gangrene	389 (81)	91 (19)
Smoking can reduce blood flow in your feet?	244 (50.8)	236 (49.2)
Loss of sensation in your foot increases the risks of diabetic foot	397 (82.7)	83 (17.3)
reduced blood flow in your foot increases the risks of diabetic foot?	366 (76.2)	114 (23.8)
Foot infection increases the risks of diabetic foot?	266 (55.5)	214 (44.5)
Controlling DM reduce the risk of diabetic foot?	338 (70.5)	142 (29.5)
Have you ever attended a class on how to care for your feet?	11 (2.3)	469 (97.7)
Have you ever received education about foot care from the nurse?	44 (9.2)	436 (90.8)
Have you ever received education about foot care from the doctor?	113 (23.5)	367 (76.4)
Have you ever received information about foot care whilst waiting to see the doctor?	16 (3.3)	464 (96.7)
Have you ever read any hand-outs on foot care?	62 (13)	418 (87)
Would you like a hand-out on how to care for your feet?	467 (97.5)	13 (2.7)

Table 3: Practice of diabetic foot care.

Variables	Yes, N (%)	No, N (%)
Do you inspect your feet daily?	297 (61.8)	183 (38.2)
Do you wash your feet daily?	466 (97)	14 (3)
Do you dry your feet and between the toes after washing?	247 (51.4)	233 (48.6)
Do you apply moisturizer on your feet?	272 (56.6)	208 (43.4)
Do you walk barefoot?	364 (75.8)	116 (24.2)
Do you use a comfortable coated shoe?	203 (42.2)	277 (57.8)
Do you inspect the shoes before wearing them?	244 (50.8)	236 (49.2)
Do you inspect the shoes before wearing them	299 (62.3)	181 (37.7)
Do you trim your nail straight and file the edges?	403 (83.9)	77 (16.1)

DISCUSSION

DFD is the one of the major causes of hospitalization in diabetic patient and that is mainly due to diabetic foot infection, gangrene, amputation and even death if the necessary care is not provided. Incidence of DFD is higher among Arab countries than in western regions.¹⁹⁻²⁰

This study showed that majority of participants had certain level of knowledge of foot care but the practice of that particular knowledge not always carried out. This finding was comparable with other related studies.²¹⁻²⁴

In the current study, the lowest knowledge score was regarding the effect of smoking on the reduction of blood flow to the lower limbs, while the lowest practice scores were related to not using a comfortable coated shoe and walking bare foot. keeping the foot susceptible to DFD.

Smoking accounts for more than half of the risks contributing to the development of peripheral artery disease and DFD. Improving knowledge by using smoking cessation interventions amongst diabetic patients may be a good public health strategy in decreasing the risks of DFD.²⁵⁻²⁸

This study also is in agreement with other previous studies that patients who have a higher level of education have better knowledge of diabetic foot care. This study also is in agreement with other previous studies that patients who have a higher level of education have better knowledge of diabetic foot care. This study also is in agreement with other previous studies that patients who have a higher level of education have better knowledge of diabetic foot care. This study also is in agreement with other previous studies that patients who have a higher level of education have better knowledge of diabetic foot care.

This study also is in agreement with other previous studies that patient who have a higher level of education have better knowledge of diabetic foot care.²⁹⁻³¹ People with higher education are expected to be more likely to read and receive information about their illness and foot care.

Unfortunately, a considerable number of the participants were not offered adequate self-care foot education, despite the presence of threatening risk factors for lower limb complications.

Few of the participances have received education on diabetic foot and foot care, and also very few (2.3%) attended a class on how to care for their feet. Probably, that's explains the marked gap in knowledge and attitude of our patients. There is a need to reorient and motivate healthcare practitioners not only educating diabetic patients but constantly reminding these patients of the complications of diabetes.

Previous studies in different countries have reported that increasing awareness of diabetic foot care, proper management and prevention resulted in a 50% reduction in diabetic foot problems and their consequences.³²⁻³⁴ Also, two studies carried out in the United Kingdom by Christie et al and Deeb reported better education among diabetic patients improves their ability to control the disease, resulting in better patient outcomes and reduced complications.^{35,36} Therefore, a structured programmed of regular group education and feedback can easily be implemented in public sector settings with minimal use of resources.

Better health education is a powerful tool to control chronic health problems such as DFD. Therefore, increasing knowledge and awareness of DFD in the diabetic patients will contribute to better community health outcomes and help them to optimize their lifestyles to get the optimum benefits and delay the complications.

Limitation

This study was conducted in different locations in urban areas. Therefore, the result of this study may not represent the entire city. To improve this issue, a larger scale study needs to be performed in different places, including rural areas, to obtain a diversified study population

CONCLUSION

Participants have insufficient knowledge, attitude and practice about DFD. providing a structured educational program about diabetic foot care has significant impact on diabetic patient to improve their knowledge and practices and to motivate them to have a positive attitude toward diabetic foot care.

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