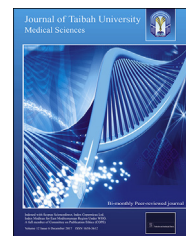




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Original Article

Descriptive study on the knowledge, attitudes and practices regarding the diabetic foot



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المخلص

أهداف البحث: تعتبر قرحة القدم واحدة من أخطر المضاعفات عند مرضى السكري، ونسبة عالية من جميع عمليات البتر هي ذات صلة بقرحة القدم السكرية. تهدف هذه الدراسة لتقييم مدى المعرفة، والوعي، والممارسة، وعوامل الخطورة المؤثرة على قرحة القدم السكرية بين مرضى السكري المراجعين لعيادة السكري في مستشفى سعودي.

طرق البحث: في هذه الدراسة المستعرضة، تم اختيار عينة عشوائية مكونة من ٢٢٩ مشاركاً من عيادة السكري في العيادات الخارجية في مستشفى الملك فهد بجامعة الدمام، خلال الفترة من يناير إلى مارس ٢٠١٥م. حيث تم توزيع استبانة تم اختبارها سابقاً لمرضى السكري للحصول على معلومات عن نتائج المتغيرات.

النتائج: أظهرت النتائج أن قرحة القدم السكرية لوحظت بين ٢٦٪ من مرضى السكري. وفيما يتعلق بالمعرفة عن القدم السكرية، فإن غالبية المشاركين كان لديهم تعليم جيد وموقف إيجابي. ومن المثير للإهتمام أن النتائج أظهرت وجود نسبة كبيرة من المشاركين يفتقدون معلومات مهمة جداً ونصائح قبل شراء حذاء جديد.

الاستنتاجات: يجب تثقيف جميع مرضى السكري عن مضاعفات القدم السكرية والمواصفات الخاصة لأحذية السكري. مع ذلك يجب أن تتحسن مستويات المعرفة، والوعي، والممارسة. ويمكن تحقيق ذلك بواسطة حملات التوعية للكشف المبكر ورعاية القدم السكرية في المملكة العربية السعودية.

الكلمات المفتاحية: القدم السكرية؛ بتر؛ عوامل الخطر؛ الوعي؛ أحذية السكري

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Abstract

Objectives: The aim of this study is to assess the knowledge, attitudes, practices and risk factors influencing diabetic foot ulcers among diabetes patients attending a diabetic clinic in a Saudi hospital.

Methods: In this cross-sectional study, a random sample of 229 participants was selected from the diabetic clinic of the outpatient department of King Fahd Hospital of the University of Dammam during January to March 2015. A pre-tested structured questionnaire was administered to the diabetes patients to obtain information regarding the outcome variables.

Results: The results showed that diabetic foot ulcers were observed among 26% of diabetic patients. Concerning knowledge of the diabetic foot, the majority of participants had good education and favourable attitudes towards diabetic foot care. Interestingly, the results demonstrated that despite these characteristics, a high percentage of the participants ignored very important information and instructions before buying new shoes.

Conclusion: All diabetic patients with diabetes mellitus should be educated regarding diabetic foot complications and the characteristic specifications of diabetic shoes. However, levels of knowledge, attitudes and practices should be improved. This improvement could be achieved by an awareness programme for the early detection and care of diabetic foot problems in KSA.

Keywords: Amputation; Attitude; Diabetic foot; Diabetic shoes; Risk factors

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Introduction

Diabetes mellitus is a multifaceted disease. Worldwide, 346 million people suffer from diabetes, and foot ulceration is one of its most common complications. It has been reported that nearly 70% of nontraumatic amputations were performed due to a diabetic foot.¹

Diabetic foot ulcer is defined as any necrosis, gangrene, or full-thickness skin defect occurring distal to the ankle in a diabetic patient.² Studies suggest that 2.5% of diabetic patients develop a diabetic foot each year, and 15% of them develop a diabetic foot during their lifetime.³

Many reports showed that this problem is the most frequent cause of hospitalization for diabetic patients, representing up to 25% of all hospital admissions of diabetic patients.⁴ In addition, reports show it has large negative impacts on patients, it lowers the quality of life with respect to psychological and physical performance compared with the general population and it incurs significant costs for health services.⁵ Moreover, the mortality rate of patients with a diabetic foot has been found to be higher than that of those without a diabetic foot.⁶

The incidence of diabetes is high among the Saudi population, and diabetes represents a major clinical and public health problem.⁷ Diabetic foot ulcers were prevalent in 13.5% of the diabetic patients referred to the nephrology clinic⁸ and in 7.7% of patients undergoing chronic haemodialysis.⁹

Clinical trials related to diabetic foot problems are more often focused on therapeutic or diagnostic issues than on prevention. Al Maskari (2007) reported that among the main risk factors for developing a diabetic foot in the United Arab Emirates was having a poor level of education.⁴

In KSA, the overall control rate and awareness are still less than is desirable. Aljoudi and his colleagues (2009) documented that there is poor knowledge of preventive measures for complications related to diabetes among Saudi patients in the Eastern Province.¹⁰

Thus, diabetic foot ulcers are highly complicated and are a serious problem for the community, as well as the patients themselves. Previous reports found that identifying people at high risk, and managing the risk factors early can reduce the outcomes of diabetic foot ulcers and lower extremity amputations.¹¹

Since there have been notably few studies conducted to assess the level of awareness and knowledge among diabetic patients, we have designed this study to assess the knowledge, attitudes and practices regarding foot ulcer care among patients attending secondary care hospitals in the Eastern Province. We hope that the information gained on the knowledge and practices regarding foot ulcer care can help

health care providers to develop targeted self-management education programmes for people with diabetes. The aims of the present study are to assess the knowledge, attitudes and practices regarding foot care among diabetes patients and to evaluate the risk factors for diabetic foot ulcers in order to improve foot care practice among diabetes patients. Finally, we are aiming to make recommendations regarding foot care to help health care providers to develop targeted self-management education programmes for people with diabetes.

Materials and Methods

This report describes a cross-sectional study. A simple random sample of 229 participants was selected from the diabetic-outpatient clinic in King Fahd Hospital of The University of Dammam during January to March 2015 in the Eastern Province of KSA to evaluate the knowledge and attitudes towards foot self-care among diabetic patients. To assess their knowledge, practices and attitudes, 16, 10 and 3 questions were asked about these topics, respectively. The proposal was approved by the IRB University ethics and research committee (IRB-2015- 01-005). Approximately 229 participants were selected by a random sampling technique.

The following inclusion criteria were considered: all patients over 18 years of age, both male and female, with type I or type II diabetes whose diagnosis had occurred at least six months earlier. Diabetic patients with traumatic ulcers resulting from causes other than perceived risk factors, such as a car accident, were excluded from the study, as were patients who were severely ill or were being treated with chemotherapy, immunosuppressive or steroid drugs.

Data were collected through a structured interview questionnaire that was adopted and given to all participants. The questionnaire covered matters of knowledge and practices regarding self-foot-care, occupational information and socio-demographic information. Patients' attitudes and educational backgrounds were reported as well. Closed-ended questions were included with three or more answering options. Answering option "No" always preceded option "Yes". Responses to the questions on knowledge were scored. The questionnaire was prepared using the recommendations of the American College of Foot and Ankle Surgeons and Diabetes UK and was used in previous studies.^{12,13} The questionnaire was translated into Arabic by experienced translators and the principal researcher. The structured patient interview questionnaire, adopted after reviewing different studies, was administered to the study participants. Every participant consent to participate and had the right to withdraw whenever they wished.¹²

Data analysis

The data were analysed with SPSS software. Percentages and proportions were used to describe categorical variables while means and standard deviations were calculated for numerical variables.

Results

Demographic properties

Two hundred twenty nine participants were included in this study of the attitudes, awareness and education regarding diabetic foot ulcers of diabetic patients in the Eastern Province of KSA with a response rate of one hundred percent. The results showed that diabetic foot ulcers were observed in 26.0% of diabetic patients. With regard to gender distribution, 54.0% of participants were male, and 75.0% were married. The mean (SD) age of the study population was 51 ± 15 years. 74.0% were diagnosed with type 2 diabetes mellitus, and 77.0% of participants had no family history of diabetes mellitus (Table 1). Considering place of residence, 40.0% were from Alkhobar, 17.0% were from Dammam, 12.0% were from Al Thuqba, 8.0% were from Aldhran, 5.0% were from Alhasa and 18.0% were from other eastern areas (Table 1).

Attitude and education on diabetic foot ulcers

Concerning knowledge of diabetic foot ulcers, the majority of study participants had good education and favourable attitudes towards diabetic foot care. Interestingly, the results showed that despite this, a high percentage of the participants ignored very important information and

advice before buying new shoes. Moreover, more than 50% of participants were unaware of the role of stress and sleeplessness on diabetes mellitus (Table 2).

More than 90% of the study participants were aware of the importance of blood glucose control, as shown on Table 2. Also the participants indicated their awareness of the importance of regular monitoring of foot condition, the risk factors for diabetes mellitus and diabetic foot problems and of having a healthy lifestyle. A substantial proportion of the participants were aware of the importance of having correct measurements for their shoes, knowing what shoes were suitable for them and inspecting the inner parts of their shoes. A greater proportion of patients showed positive diabetic foot self-care practices: they wash their feet daily and seek medical help in case of infection, as shown by Table 3 and Figure 1.

Discussion

The present study discloses important information on the diabetic foot in the Eastern Province of KSA. The study shows that the majority of the study's participants had good education and favourable attitudes towards diabetic foot care, although the results showed that a significant number of diabetic patients (26%) had a diabetic foot. Incidence of the diabetic foot is higher among Arab countries and KSA than in western regions. The study finding was comparable with the study conducted by Al-Wahbi, who reported that the incidence of the diabetic foot in KSA and the Arab world is higher.¹⁴ We believe that a possible explanation for this high prevalence of diabetic foot problems among patients in the Eastern Province might be related to diabetic foot self-care practices and diabetes-related knowledge as reported by the participants. While a very high percentage of patients still ignored important information and did not receive any advice for selecting footwear, this knowledge is important, as disregarding it can lead to impaired/delayed wound healing, increasing the odds of having diabetic foot ulcers.

The weather in KSA is mostly dry and hot throughout the year, which makes wearing sandals to avoid the heat a highly

Table 1: Participants demographic data and comorbidities.

Item	%
Male/Female	54.0/46.0
Single/married	25.0/75.0
Type 2/Type 1	74.0/26.0
Family history of DM/No family history	23.0/77.0
Alkhobar	40.0
Dammam	17.0
Al Thuqba	12.0
Aldhran	8.0
Alhasa	5.0
Easter areas	18.0

Table 2: Responses to knowledge questions for diabetic foot.

Item	Agree %	Disagree %	I don't know %
Not taking medicines regularly predisposes to complications	97.3	0.9	1.8
Continuous care a must for a diabetic foot because it may get small painless injuries	95.6	0.0	4.4
Diabetic wound care is a must because infections do not heal quickly	94.2	1.8	4.0
A diabetic foot requires care to prevent infection	94.7	2.2	3.1
Smoking causes blockage of the arteries which reduces blood flow to the foot	89.9	2.6	7.5
Diabetic patient must follow a balanced diet	92.4	1.3	6.2
Diabetic patient must exercise	92.0	0.9	7.1
Diabetic patient should check his foot	80.8	15.2	4.0
Does obesity contribute to diabetes?	92.4	2.7	4.9
Does sleeplessness contribute to diabetes?	39.4	25.8	34.8
Do sedentary habits contribute to diabetes?	67.9	8.6	23.5
Does stress contribute to diabetes?	43.9	15.7	40.4
Does hyperglycaemia contribute to diabetic foot problems?	85.7	1.3	13.0
Does ischaemia contribute to diabetic foot problems?	50.5	6.3	43.2
Does atherosclerosis contribute to diabetic foot problems?	53.6	9.5	36.9
Does infection contribute to diabetic foot problems?	65.9	4.9	29.2

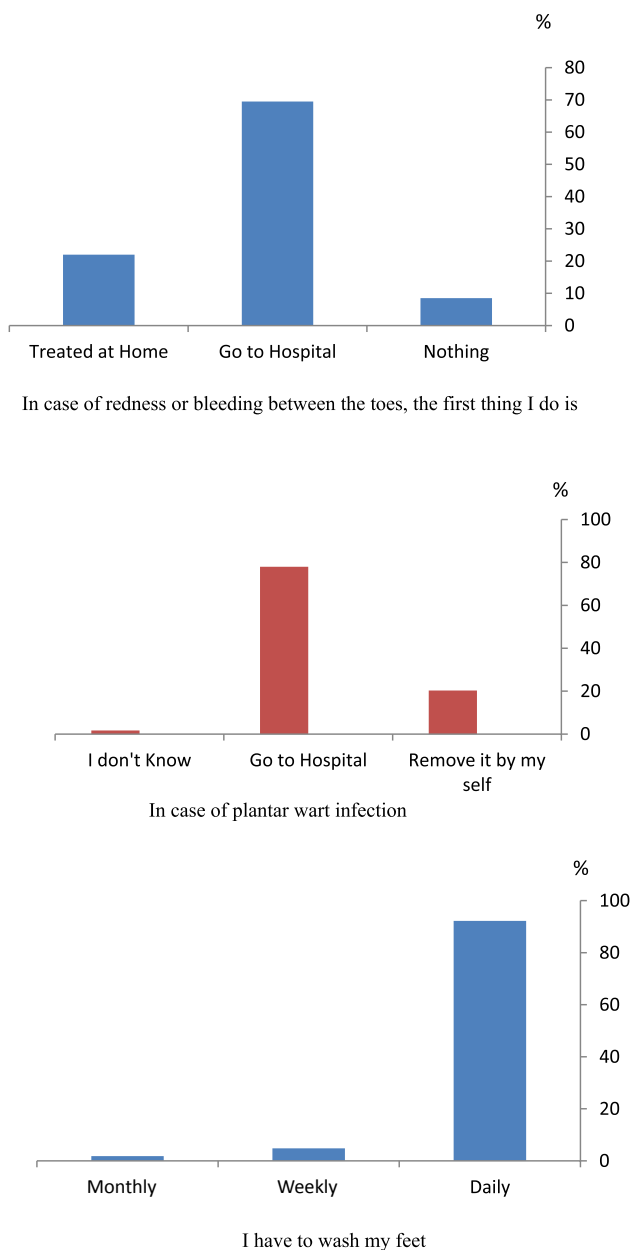


Figure 1: Foot care attitudes for a diabetic foot.

common habit. There are many types of sandals, but they have common effects. Such footwear is not a good protector from injuries because the foot is exposed to heat, dryness and injuries and there is a ridge-like part that is commonly seen between the first and second toe. This ridge causes friction and injury that is not appreciated by the naturopathic senseless foot and is the nidus of the problem.¹⁴

This increased risk among those who use sandals or ill-fitting shoes might be related to high frequencies and chances of foot trauma, which may result in subsequent diabetic foot ulceration. Walking barefooted, especially indoors, is still a common habit. This habit is another factor in developing diabetic foot infections and complications. Moreover, the lifestyle in KSA is sedentary due to such factors as the weather's being hot, humid or very cold, meaning that walking is difficult and that people depend on riding. This

lifestyle may have a negative effect on glycaemic control and diabetic foot problems.¹⁵

Studies show that beside education level, the length of disease duration, cardiovascular disease and poor glycaemic control were the main risk factors for developing a diabetic foot.⁴ Diabetic patients have a high risk of atherosclerosis and, in combination with retinopathy, diabetic patients are more prone to accidents and trauma that would be a cause of foot ulceration. Previous studies conducted in Makkah, KSA reported that 86% of diabetic foot problems were due to diabetes with cardiovascular complications.¹⁶

Lack of training programmes and awareness among health care providers, lack of a concept of a team approach for treatment of complicated foot issues and lack of quality assurance programmes could be other possible causes for poor outcomes in cases of foot complications in diabetic patients.¹⁷

This finding could explain the high percentage of patients having a diabetic foot in the studied sample.

These data were further corroborated when a majority of the participants reported not knowing about the impact of stress and sleeplessness. The literature is replete with studies demonstrating that stress and sleeplessness can contribute to the development of diabetes mellitus, mainly type 2, either directly, by having a deleterious effect on glycaemic control, or indirectly via a dysregulation of appetite, leading to obesity, which is a major risk factor for insulin resistance and diabetes.¹⁸

Despite this, the encouraging finding was that most of the participants in the Eastern Province demonstrated good attitudes and awareness regarding issues related to diabetes mellitus and the diabetic foot. In addition, participants learnt to seek immediate medical advice when they found any lesions on their feet.

A diabetic foot is one of the main causes of amputation and its subsequent emotional and physical problems. Poor diabetic foot care is one of the risk factors for developing a diabetic foot and requiring amputation.¹⁹ 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.^{20,21}

This study's limitation is that the participants were selected based on attending a specialized clinic, where the prevalence of the risk factors may be higher than among patients in the primary health care centres.

Conclusions

This cross-sectional study could be considered to be a preliminary study identifying diabetic foot self-care practices and diabetes-related knowledge as influential factors for the development of a diabetic foot. There is no known factor that may predispose a patient to having a diabetic foot. However, levels of knowledge, attitudes and practices among diabetic patients should be improved.

Recommendation

All patients with diabetes should be educated on diabetic foot complications and footwear. Increasing awareness of

Table 3: Foot care practice for a diabetic foot.

Item	Agree	Disagree	I don't know
I inspect my foot regularly	79.5	18.7	1.8
I wash my foot regularly	94.7	4.9	0.4
I wash my foot with warm water	75.2	22.1	2.7
I cut my nails straight across and not too short	66.2	25.4	8.4
I measured the size of my foot the last time I bought shoes	37.2	56.1	6.7
I receive tips before buying shoes	43.6	52.0	4.4
I check the inner part of my shoe constantly	49.5	43.8	6.7
I walk barefoot frequently ^a	36.9	60.4	2.7
I clean my nails with sharp objects ^a	33.6	63.2	3.1
I wear tight rubber stockings ^a	16.7	79.2	4.1

^a Negative diabetic foot self-care practices.

the diabetic foot will no doubt have a significant impact on reducing the rate of amputation and patients should receive an annual foot examination to identify high-risk foot conditions. It is important that health care providers should be aware of the importance of giving advice about footwear to all people with diabetes apart from foot care and education.

Disclosure

The authors have no conflict of interest to declare.

Authors' contributions

All authors have made substantial contributions to the conception, design, acquisition of data and interpretation. These researchers participated in drafting the article, revising it critically for important intellectual content, and approved the final version submitted.

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