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A CROSS-SECTIONAL STUDY TO ASSESS THE KNOWLEDGE AND LEVEL OF PRACTICE OF FOOT CARE AMONG DIABETIC PATIENTS PRESENTING TO DIABETIC CLINIC AT MAYO HOSPITAL, LAHORE

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Abstract:
Objective: To assess the knowledge and practices among the diabetic patients regarding foot care.
Methods: In this cross sectional study, by using non-probability convenience sampling, 100 diabetic respondents fulfilling the inclusion criteria were included in the study. Their knowledge and practices regarding foot care were assessed by a pre-tested questionnaire and classified as good, satisfactory and poor depending upon the score. Fifteen questions each were asked regarding knowledge and practices of foot care. Each question was assigned one mark. If score was more than 70% (11-15), it was regarded as good, if score was 50-70% (8-10) it was regarded as satisfactory and if score less than 50% (<8) it was regarded as poor both for knowledge and practice for foot care.
Results: The mean age of the respondents was 48 ± 10.8years. About 29.3% respondents had good knowledge, 40% had satisfactory knowledge and 30.7% had poor knowledge about foot care. Whereas only 14% respondents had good practices for foot care, 54% had satisfactory practices and 32% had poor practices. Education of the respondents had significant statistical association with knowledge (p-value<0.001) and practices (p-value <0.001) regarding foot care. Sex and income per capita had shown no significant statistical association with knowledge and practices regarding foot care.
Conclusion: About one third of diabetic patients had poor knowledge about foot care and only very few patients had good practices for foot care. Literacy has significant association with the knowledge and practices related to foot care in diabetic patients.

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INTRODUCTION:

Diabetes mellitus is a metabolic disorder characterized by the presence of hyperglycemia due to impaired insulin secretion, defective insulin action or both. The chronic hyperglycemia of diabetes is associated with significant long term macrovascular and microvascular complications (28) One of the major complications associated with diabetes mellitus is the diabetic foot disease (4, 5). The **diabetic foot disease (DFD)** includes several pathologies mainly diabetic peripheral neuropathy and peripheral arterial disease which result in foot ulceration (8, 9) The term **peripheral artery disease (PAD)** broadly encompasses the vascular diseases caused primarily by atherosclerosis and thromboembolic pathophysiologic processes that alter the normal structure and function of the aorta, its visceral arterial branches, and the arteries of the lower extremity (17) **Diabetic neuropathy** is defined as the presence of symptoms and/or signs of peripheral nerve dysfunction in people with diabetes after the exclusion of other causes (18) Loss of sensation caused by peripheral neuropathy, ischemia due to peripheral arterial disease, or a combination of these may lead to **foot ulcers**. In low and middle income countries barefoot walking, lack of awareness, delay in seeking care, and shortage of trained healthcare providers and foot care services are common factors that add to the burden of foot disease. The **foot risk status** can be classified using International Diabetes Federation global guideline for type 2 diabetes, where **"no added risk"** defines a foot with no any risk factor, **"at risk"** foot has one risk factor without previous history of Diabetic foot ulcer or amputation and **"high risk"** foot has more than one risk factor or previous history of Diabetic foot ulcer or amputation (12).

Globally, an estimated 422 million adults were living with diabetes in 2014, compared to 108 million in 1980(3) A systematic review (78 studies from 84 cohorts) reports a prevalence of 0.003-2.8% for diabetes related peripheral neuropathy and 0.01-0.4% for diabetes related peripheral arterial disease.(33) For diabetic foot syndrome prevalence rates between 4% and 15% have been recorded. The lifetime risk for developing a diabetic foot ulceration is 25% of which the majority will need amputation within four years of initial diagnosis (29, 30, 31, 32) A research conducted in 2013 found out that diabetic foot almost affects 50% of patients and accounts for nearly 80% of all non-traumatic amputations of the lower limb (4, 5). Furthermore, the disease represents nearly 35% of all hospital admissions in diabetic specialized clinics (4). Another study found out that in terms of cost, it represents 12-15% of the overall cost associated with

diabetes and up to 40% in developing countries (6, 7) It can impair quality of life of patient and affect social participation and livelihood (34) In a cross sectional study performed on an in-patient population at a tertiary medical centre in Malaysia from September 2013 to April 2014 for diabetic foot infections 58% of the patients had poor foot care knowledge while 61.8% had poor diabetic foot care practice as compared to the median score (15) Another multi-centre cross-sectional study carried out in three tertiary hospitals in Nigeria from November 2009 to April 2010 established that 68.8% of the diabetic patients were unaware of the first thing to do when they found redness/bleeding between their toes and 61.4% were unaware of the importance of inspecting the inside of the footwear for objects. Poor foot practices included 89.2% not receiving advice when they bought footwear and 88.6% failing to get appropriate size footwear. Illiteracy and low socioeconomic status were significantly associated with poor knowledge and practice of foot care.(16) Evidence for the effectiveness of patient education on foot care is lacking. A Cochrane review of 11 randomized controlled trials concluded that brief foot care education alone does positively influence patient knowledge and behaviour in the short term, but it is ineffective in preventing diabetic foot ulcers. Education in a structured, organized, and repetitive manner, combined with preventive interventions may, however, prevent foot problems(31) Although the International Working Group on the Diabetic Foot acknowledges the limited evidence on long term efficacy of patient education, it recommends some form of patient education to improve their foot care knowledge and behavior (32)

Increasing the knowledge, awareness and self care of the foot among diabetic patients have found to be cost effective ways of preventing DM foot ulceration (35, 36) especially in low income economy characterized by inadequate healthcare facilities and lack of skilled healthcare personnel. Efforts have been made to increase public awareness of diabetic foot in the forms of health campaigns, public service advertisements and education by primary healthcare workers. However there are no studies in the literature that assess the current level of awareness of diabetic foot care in our diabetic patients. The main objective of this study is to determine the level of knowledge and practice of foot care among diabetic patients attending a tertiary care hospital in Lahore and whether the awareness varied with the level of healthcare they had been availing. Moreover, we would also want to determine the factors associated with the different levels of knowledge and practice of foot care such as the demographic and clinical profile

of the patients so that a strategy for foot care could be developed.The information obtained will inform the current situation in relation to diabetic foot prevention strategies, and will help to improve quality of care for diabetic patients to reduce the burden associated with diabetes foot complications. Educating patients is likely to be effective if we are aware of their current knowledge and practices on foot care.

OBJECTIVE
To determine the level of knowledge and practice of foot care among diabetic patients attending diabetic clinic at Mayo Hospital, Lahore.

OPERATIONAL DEFINITIONS
1-DIABETES MELLITUS
Diabetes mellitus is a metabolic disorder characterized by the presence of hyperglycemia due to impaired insulin secretion, defective insulin action or both.
The diagnostic criteria (39) for diabetes mellitus is as follows
HbA1c ≥ 6.5 % (≥ 48 mmol/mol)
Random plasma glucose ≥ 200 mg/dl (≥ 11.1 mmol/l)
Fasting plasma glucose ≥ 126 mg/dl (≥ 7.0 mmol/dl)
OGTT 2hour glucose in venous plasma ≥ 200 mg/dl (≥ 11.1 mmol/l)

2-DIABETIC FOOT DISEASE
The diabetic foot disease (DFD) includes several pathologies mainly diabetic peripheral neuropathy and peripheral arterial disease which result in foot ulceration
Foot risk status is assigned using International Diabetes Federation global guideline for type 2 diabetes according to which:
"No added risk" defines a foot with no any risk factor
"At risk" foot has one risk factor without previous history of Diabetic foot ulcer or amputation
"High risk" foot has more than one risk factor or previous history of Diabetic foot ulcer or amputation
3-PERIPHERAL VASCULAR DISEASE
The term peripheral artery disease (PAD) broadly encompasses the vascular diseases caused primarily by atherosclerosis and thromboembolic pathophysiologic processes that alter the normal structure and function of the aorta, its visceral arterial branches, and the arteries of the lower extremity.
Peripheral vascular disease is defined as Ankle Brachial Pressure Index ABPI of < 0.9 (38)
4-DIABETIC NEUROPATHY
Diabetic neuropathy is defined as the presence of symptoms and/or signs of peripheral nerve

dysfunction in people with diabetes after the exclusion of other causes
Modified Neuropathy Disability Score (NDS) (37) was used to assess PN, whereby absent pain, vibration, and pressure senses were assigned 1 point each and 0 point where they were present. Ankle reflexes were assigned 2, 1, and 0 points for absent, present with reinforcement, and present without reinforcement, respectively. Severity of PN was graded after summation of all the assigned points and classified as follows:
No neuropathy (score 0)
Mild neuropathy (score 1–3)
Moderate neuropathy (score 4–7)
Severe neuropathy (score > 7)

MATERIALS AND METHODS:
STUDY DESIGN:
It was an observational cross-sectional study. The method was chosen because it is time-effective and provides a lot of data.

STUDY SETTINGS AND DURATION:
The data for the research was collected from the diabetic clinic at Mayo Hospital, Lahore. The data was collected during three months from the patients visiting the diabetic clinic from 1st May 2018 to 31st July, 2018.

SAMPLE SIZE AND SAMPLING TECHNIQUE:
The sample included 100 patients who visited the diabetic clinic at Mayo Hospital, Lahore. A simple random technique was used to select the sample

SAMPLE SELECTION CRITERIA:
Inclusion criteria
The following patients were selected for the study
•   All the patients visiting the diabetic clinic at Mayo Hospital, Lahore from 1st May, 2018 to 30th July, 2018.
•   Patients who were diagnosed to have type 2 diabetes.
•   Patients with age of 18 years and above.
•   Both male and female patients were included.
•   Patients who had never developed a foot ulcer.
•   They were able to write and read or can be helped to fill in the questionnaire.
•   They did not have any mental disease or dementia
•   They were willing to participate

Exclusion criteria:
The following students were excluded from study:
•   The patients who had not consented.

•   The patients who are unable to answer the questions because of altered mental status.
•   Patients with cognitive/ hearing impairment.
•   Patients with previous or present foot ulcer.

DATA COLLECTION TOOL AND PROCEDURE:
The survey instrument was a standard questionnaire to enquire about knowledge and practice of foot care. The questionnaire was in English language which is the official language of communication in Pakistan and was translated into Urdu language for those who could not communicate in English language. The questionnaire consisted of 11 questions on knowledge of foot-care and current self-care practice respectively and each correct answer was assigned one mark.

The questionnaires were administered by house officers. The outcome variables were knowledge and practice regarding foot care among diabetic patients. The data obtained were analyzed using SPSS statistical software version 15. Frequency and descriptive statistics were used to examine the general characteristics of the respondents. The response to questions on knowledge, practice and barriers to foot care were analyzed and the knowledge and current practice score of each respondent was determined. A score greater than 10 was regarded as good, a score of 6-10 was regarded satisfactory and a score of less than 6 was considered poor. Student t test was used to compare the means of the scores and Chi square test was used to assess the significance of the responses and a p value of < 0.05 was considered statistically significant.

RESULTS:
Characteristics of the patients in the study
We enrolled a total of 100 diabetic patients to the study, 33% were males and 67% were females. 31% were below 55 years of age and 69% were above the age of 55 years. The mean age of the respondents was 47 years. Of 100 patients, 96 were married and 4 were single. 35% had primary education, 25% had secondary education and 40% had post secondary education. Out of the 100 patients interviewed, 6 belonged to upper class. 31 belonged to middle class and 63 belonged to low socio-economic status. 18 had diabetes for less than 5 years, 54 had diabetes for 5 to 10 years and 28 had diabetes for a duration of more than 10 years. 8 were not taking any treatment for diabetes previously, 13 were relying only on lifestyle modification, 67 were using oral hypoglycemic drugs while 12 were on insulin therapy.35 were availing primary healthcare facility previously, 25 were enjoying secondary healthcare facility while 40 were enjoying tertiary healthcare facility.36 had presence of a risk factor for the diabetic foot ulcer while 64 had no risk factor. Out of 100 patients, 18 had experienced foot problems previously including delayed healing (>2 weeks) of a sore or cut on foot, a foot ulcer or amputation of toe, foot or leg. These characteristics have been shown in table 1.

CHARACTERISTICS OF STUDY POPULATION	FREQUENCY (%)
AGE >55 years < 55 years	Mean age 31% 69%
GENDER Male Female	 43% 57%
MARITAL STATUS Single Married	 4% 96%
EDUCATION LEVEL No formal education Primary education Secondary education Post secondary education	 22% 40% 25% 13%
SOCIO-ECONOMIC STATUS Upper class Middle class Lower class	 6% 33% 61%

DURATION OF DIABETES	
<5 years	18%
5- 10 years	54%
>10 years	28%
PREVIOUS TREATMENT FOR DIABETES	
No previous treatment	8%
Lifestyle modification	13%
Oral hypoglycemic	67%
Insulin therap	12%
LEVEL OF PREVIOUS HEALTHCARE FACILITY	
Primary level	35%
Secondary level	25%
Tertiary level	40%
PRESENCE OF RISK FACTORS FOR DIABETIC FOOT ULCER	
Neuropathy	36%
Numbness, pins and needles or tingling sensation	
Vasculopathy	
Absent dorsalis pedis pulsation	
Pain or cramping in the feet, calves , thighs or buttocks while walking	41%
Current foot problems	
Ulcer, sore or blister on foot at the present time	18%
Blood or discharge noted on the socks	
Callus build up on the feet	

Knowledge of foot care

The mean knowledge score was 14 . The range of knowledge score obtained in this study was 0 to 18. A score greater than 14 was regarded as good, a score of 10-14 was regarded satisfactory and a score of less than 10 was considered poor.21 had good knowledge , 27 had satisfactory knowledge while 32 had poor knowledge of the foot care. Out of the 100 patients interviewed, 20 had no knowledge of the importance of keeping blood glucose under control. Out of the 100 patients who were questioned regarding regular foot care, the awareness of self-inspecting the feet daily was 54, washing the feet regularly was 63, keeping the skin between the toes dry was 35, moisturizing the feet was 25 and protecting the feet from too hot or too cold temperature was 41, 34 were unaware of the management of callus while awareness of avoiding the crossing the legs for prolonged periods of time was present among 19. Regarding regular nail care practices, 29 patients were cognizant of daily inspection of nails while 43 had knowledge of the importance of trimming toenails straight with care. Out the 100 patients interviewed about footwear, 17 knew about the importance of not walking barefoot both indoors and outdoors, 43 had awareness of the need to wear comfortable coat shoes, 24 had knowledge of checking the shoes from inside before wearing while 16 were cognizant of the use of special footwear in case of a foot ulcer. The distribution of the response to the questions related to the knowledge of foot care.

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