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Research Article

KNOWLEDGE AND PRACTICE REGARDING FOOT CARE AMONG TYPE 2 DIABETES MELLITUS PATIENTS AT A TERTIARY CARE HOSPITAL IN COASTAL SOUTH INDIA

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ABSTRACT

Objective: The present study was designed to assess the knowledge and practice among diabetic patients in a tertiary care hospital regarding diabetic foot care.

Methods: A cross-sectional study was conducted in government district hospital of Mangalore in the month of January 2014. A pre-designed semi-structured questionnaire was used to collect the information pertaining to the knowledge and practices of the diabetic patients regarding foot care. The collected data were analyzed using Statistical Packages for Social Sciences version 11.5. The results obtained were expressed in proportions.

Results: A total of 133 subjects were assessed regarding their knowledge and practice regarding diabetic foot care. Around three-fourth (75.2%) of participants had adequate knowledge. More than half (55.5%) of the subjects had adequate practice. No significant association was found between study variables such as gender, socioeconomic status, and education status with awareness regarding diabetic foot care in the present study ($p>0.05$). Gender, socioeconomic, and educational statuses were found to be significantly associated with diabetic foot care practices.

Conclusion: The gap between knowledge and practice regarding self-care among diabetic patients can be bridged by providing continuous health education by the health workers. Foot care should be promoted at all available opportunities whenever the patient comes in contact with the health system.

Keywords: Mangalore, Foot care, Diabetes.

INTRODUCTION

Globally, non-communicable diseases (NCD) such as hypertension, diabetes mellitus, and cardiovascular disease are the leading cause of death attributing to 63% of overall causes of mortality. Over nine million deaths due to chronic disorders occur below the age of 60 years, and 90% of them are from middle and low-income countries [1]. Around three million deaths worldwide occur due to diabetes among 347 million people suffering from it. According to World Health Organization (WHO) projections by the year 2030, it will be the seventh leading cause of death [2-4]. In India, NCD contributes to 53% of total mortality, and around 2% of it is contributed by diabetes mellitus [5]. Diabetes can lead to several complications, the important being the complications related to foot [6]. A lower limb is lost every 30 seconds globally, and it is estimated that at least 25% cases of diabetes are at risk of developing a foot ulcer. 40-70% of lower limb amputations are related to diabetes [7,8]. People suffering from any diabetic related to complications, uncontrolled diabetes, males, and having diabetes for more than 10 years have increased the risk of developing foot-related complications. Routinely foot examination in diabetic individuals is done annually. People with neuropathic disorders are advised to get a visual inspection of their foot during every visit. Patients are examined for the presence of bony deformities, callous formation, erythema, and limitation in joint mobility [9,10]. The most cost effective measure of preventing foot-related complications is enhancing the knowledge and awareness among diabetic patients [11,12]. Patients with preexisting complications are mainly provided with health education [13]. Patients with low risk are usually neglected [14,15]. If diabetes in not controlled, even patients with low risk can also develop complications [16]. American Diabetic Association and International working group on diabetic foot have issued guidelines regarding diabetic subjects with low risk [17,18]. Various studies have indicated that adequate self -care of foot is not followed among diabetic patients [13,19-21]. There was no research conducted among diabetic patients on knowledge and practice regarding foot care. In coastal part of Karnataka, so the present study was designed to assess the knowledge and practice among diabetic patients in a tertiary care hospital regarding diabetic foot care.

METHODS

This cross-sectional study was conducted at two tertiary care teaching hospitals of Kasturba Medical College (Manipal University), Mangalore. The study population included Type 2 diabetic patients who have been diagnosed for the duration of more than 1 year. The sample size of 133 was calculated by considering the awareness regarding foot care among diabetic patients as 75% [22], with a relative precision of 10% and 95% confidence interval with a non-response error of 20%. Data were collected using a semi-structured questionnaire prepared after an extensive review of the literature and consultation with experts. It consisted of 4 sections. Section A: Sociodemographic profile of participants, Section B: Diagnosis and treatment details of diabetes, Section C: Knowledge regarding diabetic foot care, Section D: Practice regarding diabetic foot care. The knowledge part of questionnaire consisted of eight questions with a correct and wrong answer. One point was assigned for every correct response and zero for wrong. A total score of ≥5 was considered as adequate knowledge. The practice part consisted of eight questions with a yes or no response. One point was assigned for every yes response and a zero for every no answer. A total score of ≥5 was considered as good practice.

Institution Ethics Committee approval was obtained prior to the commencement of the study. After obtaining permission from the

medical superintendent of the hospitals, the study participants were briefed about nature and the purpose of the study and were included in the study after taking a written informed consent. The participants were selected using convenience sampling.

The collected data were analyzed using SPSS version 11.5. Results were expressed in proportions and chi-square test was applied to find out the association between the level of knowledge and practice regarding diabetic foot care with clinical and sociodemographic variables and $p<0.05$ was considered as statistically significant.

RESULTS

A total of 133 diabetic patients were assessed for their knowledge and practice regarding diabetic foot care. The age of participants ranged between 31 and 82. The majority of participants were in age group of 51-60 years (n=40, 30.1%). The mean age of study participants was around 59 years (standard deviation-11.23). Gender distribution was homogenous. Most of the participants were from urban areas (n=93, 69.9%). The majority of the subjects belonged to the category of unskilled or semiskilled workers (91, 68.5%). The baseline characteristics of study subjects are shown in Table 1.

Table 2 depicts the clinical characteristics of the study subjects. The age at diagnosis was more than 45 years in most of the participants (n=81, 60.9%). Duration of illness was more than five years in the majority of participants (n=69, 59.2%). When the participants were asked about the treatment being taken for diabetes majority (n=70.7%) of them were on oral hypoglycemic drugs (OHG) followed by a combination of insulin and OHG drugs (21.1%). Around 35.3% of subjects had a family history of diabetes. Smoking was reported by 12.8% of the patients.

Table 1: Baseline characteristics of study subjects (n=133)

Variables	Number (%)
Age group (years)	
≤40	05 (03.8)
41-50	29 (21.8)
51-60	40 (30.1)
61-70	37 (27.8)
>70	22 (16.5)
Gender	
Male	70 (52.6)
Female	63 (47.4)
Place	
Urban	93 (69.9)
Rural	40 (30.1)
Education	
Illiterate	06 (04.5)
Primary school	54 (40.6)
High school and above	73 (54.8)
Occupation	
unemployed	62 (46.6)
Unskilled	28 (21.0)
Skilled and semiskilled workers	15 (11.2)
Professionals	28 (21.0)
Socio-economic	
Upper/middle class	80 (60.2)
Lower class	53 (39.8)

Table 2: Clinical characteristics of study subjects (n=133)

Variables	Number (%)
Age at diagnosis (years)	
≤45	52 (39.1)
>45	81 (60.9)
Duration of illness (years)	
1-5	64 (40.8)
>5	69 (59.2)
Medication	
Only diet	02 (01.5)
Oral hypoglycemic drugs	94 (70.7)
Insulin injections	09 (06.8)
Combined	28 (21.1)
Family history of diabetes	
Present	47 (35.3)
Absent	86 (64.7)

Knowledge of the participants regarding diabetic foot care is shown in Table 3. Around three-fourth (75.2%) of participants had adequate knowledge. The majority of participants had knowledge regarding the correct way of cutting and grooming of nails (89.5%) and proper method of drying the foot and in between areas of toes (82.7%).

Table 4 shows the response of diabetic patients to foot care practices. More than half (55.5%) of subjects had adequate practice. The majority (91.7%) of subjects practiced proper trimming of nails. Around three-fourth of subjects (73.7%) did regular monitoring of feet. More than half (63.9%) of the subjects inspected shoes before wearing and more than a quarter (27.1%) of diabetic patients walked around barefoot.

The association of sociodemographic characteristics and duration of illness was assessed on knowledge and practice of foot care using Chi-square test. Gender and educational status were significantly associated ($p<0.05$) with diabetic foot care practice as shown in Tables 5 and 6.

DISCUSSION

The most common reason for hospital admission among diabetic patients is foot-related complications. The WHO and International Diabetic Federation has been stressing on the importance of self-care in diabetes in their campaign to prevent diabetes-related complications. The World diabetes day slogan for the year 2005 was "put feet first: Prevent amputations." It determined to provide advance education to people to create awareness and the need to provide proper foot care among health-care providers all over the world [23].

Knowledge is valuable in making patients to avail the health care facilities at the suitable time. It will also help them to take appropriate

Table 3: Responses to knowledge regarding foot care (n=133)

Questions related to knowledge of foot care	Number (%)
Do you know that diabetes is an incurable disease?	92 (69.2)
Do you know that diabetes can lead to chronic complication?	91 (68.4)
Do you know that diabetes can be controlled by regular exercising and dieting?	98 (73.7)
Is correct way of cutting and grooming of nails known to you?	119 (89.5)
Are you aware that you should dry your feet and in between the toes properly?	110 (82.7)
Do you know that regular monitoring of feet is important?	98 (73.7)
How often do you examine your feet?	74 (55.6)
If corns and calluses are found on your feet what will you do?	90 (67.7)

Table 4: Responses to practice regarding foot care (n=133)

Questions related to practice of foot care	Number (%)
Daily soaking of feet	53 (39.0)
Regular monitoring of feet	98 (73.7)
Walking around bare-feet	36 (27.1)
Daily checking of feet for cracks, cuts and blisters	68 (51.1)
Inspecting shoes before wearing	093 (63.9)
Proper trimming of nails	122 (91.7)
Sitting with legs crossed	023 (17.3)
Checking blood glucose every 3 months	122 (91.7)

Table 5: Association of demographic and clinical characteristics with knowledge and practice of diabetic foot care (n=133)

Demographic and clinical characteristics	Adequate foot care knowledge (n=100) (%)	Inadequate foot care knowledge (n=330) (%)	p value*
Gender			
Male	49 (70)	21 (30.0)	
Female	51 (81)	12 (19.0)	0.14
Education status			
Illiterate/primary	48 (80)	12 (20.0)	0.231
High-school and above	52 (71.2)	21 (28.8)	
Duration of illness (years)			
≤5	38 (70.4)	26 (29.6)	
>5	62 (78.5)	07 (21.5)	0.28

*Chi-square test

Table 6: Association of demographic and clinical characteristics with practice of diabetic foot care (n=133)

Demographic and clinical characteristics	Adequate foot care practice (n=74) (%)	Inadequate foot care practice (n=59) (%)	p value*
Gender			
Male	49 (70.0)	21 (30.0)	
Female	25 (39.7)	38 (60.3)	0.000
Education status			
Illiterate/primary	29 (48.3)	31 (51.7)	
High-school and above	45 (61.6)	28 (38.4)	0.023
Duration of illness (years)			
≤5	27 (50.0)	37 (50.0)	
>5	47 (59.5)	22 (40.5)	0.27

*Chi-square test

measures. A study conducted in Thailand showed lack of knowledge as an important risk factor for diabetic ulcer [24]. Awareness regarding foot problems and care of feet is lower in India [25]. In our study, three fourth of diabetic patients had adequate knowledge regarding foot care which was similar to observations made in a study done at Vellore among diabetic patients attending general clinic [22]. However, studies conducted in other parts of India showed a lower knowledge [26,27]. Poor knowledge of diabetic foot care was also seen in studies conducted in other Asian countries [28-30]. A study conducted in South Africa to assess the knowledge of diabetes mellitus among diabetic patients found that only half of the study population ware aware on basic foot hygiene [31]. Higher literacy rate may be the cause for better awareness in the present study. Awareness regarding foot care such as cutting and trimming of nails, drying of foot especially between the toes, regular monitoring of the foot was much higher in the present study as compared with the studies conducted in Lahore and Bijouy [26,32]. South Canara is a hub of medical colleges and hospitals are coming up at a rapid pace, and it is emerging as one of the major healthcare centers in south India. Hence, accessibility to health services is better in the study area.

Foot care practices are essential to prevent the injuries to the foot. Half of the participants in our study followed proper foot care practices. In a multi-centric study in India, 35% of subjects followed proper foot care practices and only 2% of them took professional help [33]. The present study findings are in conformity with studies conducted in other parts of the globe [29,32,34,35]. A higher proportion of participants followed proper foot care in studies from Malaysia and Bangladesh [36,37]. Less than half of the participants followed the practice of daily soaking of foot. In contrast, studies from Nigeria, Pondicherry and Lahore showed a higher practice with this aspect of diabetic foot care [32,34,38].

Subjects with longer duration of the disease had better knowledge regarding foot care. This is attributed to the fact that people with longer duration of disease would more often come in contact with the health system and repeated reinforcement of advice by the health professionals might bring about an improvement in the awareness of the patient. The observations of Dalmaperiera *et al*. were in conformity with the present study findings [39].

In Warm countries, barefoot walking is commonly practiced [40]. It is one of the main predisposing factors for foot ulcers. It can cause injury to feet by sticks and thorns. In a study done by Jayasinghe *et al*., 84% of study population was barefoot at the time of injury and in 40% of them it was due to prick injury or knock on an hard object [41]. A significant association was found between barefoot walking and foot infections in a study conducted in a diabetic clinic in Chennai (Vishwanathan urban-rural difference 2006) [40]. Walking around barefoot in the present study is seen in 27% which was much higher than studies conducted in Pondicherry, Khamesh [29,38]. In a multi-centric study conducted by Vishwanathan *et al.* in India only 7% of the study population followed barefoot walking [33]. This practice should be discouraged as it is one of the main causes of foot ulceration and can lead to amputation of the foot.

Large gaps between self-reported knowledge and actual foot care practices were found in a study conducted among veterans of diabetes by Olson *et al*. which was similar to the observations made in our study [42]. This may be due to decreased mobility and diminished vision which may not allow the patients to perform preventive diabetic foot care practices. Affordability may also be one more cause for the gap between knowledge and actual practice of diabetic foot care especially in developing countries like India.

No significant association was found between study variables such as gender, socioeconomic status, and education status with awareness regarding diabetic foot care in the present study ($p>0.05$). However, studies conducted elsewhere gender, education, and socioeconomic status were found to be significantly influencing awareness regarding foot care among diabetic patients [32,34,43]. Interestingly in our study gender, socioeconomic, and educational status were found to be significantly associated with diabetic foot care practices. A multi-center study conducted in Bangladesh gender, education, age, and socioeconomic status was found to be significantly associated with foot care examination and hygiene foot care practices [44]. Positive association of education with foot care practice were seen in studies conducted in Pakistan [32,45].

Higher level of knowledge as compared with other studies is a positive finding, however, sustained efforts has to be made to further increase the knowledge of foot care among diabetic patients in order to minimize the foot related complications and to promote the health and wellbeing of the diabetic patients.

The gap between knowledge and practice regarding self-care among diabetic patients can be bridged by continuous health education by the health workers. Education must be provided on a regular basis at every level by all the persons of the health system. Foot care should be promoted at all available opportunities whenever the patient comes in contact with the health system. Since the study was done in a tertiary care setting it does not reflect the knowledge of people in the community and further research has to be conducted to assess the educational related needs of the community.

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