

**Original Article**

**A STUDY ON KNOWLEDGE, ATTITUDES, AND PRACTICES FOR THE PREVENTION OF DIABETIC FOOT IN RURAL TERTIARY CARE TEACHING HOSPITAL**

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**ABSTRACT**

**Objective:** To assess the knowledge, attitude, and practice of diabetic patients regarding care of their own feet.

**Methods:** This is a cross-sectional study conducted in the inpatient department of surgery at Adichunchanagiri hospital and research centre, B. G. Nagara, Karnataka, India from 1<sup>st</sup> Nov. 2016 to 31<sup>st</sup> Dec. 2016. The relation between gender and knowledge, attitude and practices of people with diabetes patients were compared by using the Chi-square test at 95% confidence interval at  $p < 0.05$ .

**Results:** Out of 51 patients, 72.54% were male and 27.46% female and 45.1% of the patients were in the age range 61-80 y. The mean SD of the age was  $60.49 \pm 14.02$ . The mean SD of body weight of the patient was  $66.17 \pm 8.54$ . The majority of the patients 45.1% were farmers and 41.7% were illiterate. Most of them did not know the practice of correct foot hygiene (39.22%) and what abnormalities observe in their feet (66.67%). We found that 90.2% patients were engaged in foot self-care practice and more than half of them (54.1%) always inspected their footwear before using it. Interestingly, more women were involved in foot care (100%) as compared to men (86.46%) but statistically not significant ( $p = 0.147$ ).

**Conclusion:** We found that patients were not having sufficient knowledge about the correct hygiene of the foot, what abnormalities to observe in their feet and about ideal footwear. Even though females were showing interest towards self-care examination and foot care practice, it is essential that all the diabetic patients must be educated about the knowledge, attitude and foot self-care practice to prevent diabetic foot related complications.

**Keywords:** Diabetes, Diabetic foot, Knowledge, Attitude, Practice and cross-sectional study

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**INTRODUCTION**

Currently, there are an estimated 366 million people affected with diabetes mellitus globally and India is estimated to have 61.3 million diabetics, which is projected to cross 100 million by the year 2030 [1].

Diabetes mellitus is a disease known for its multifaceted complications and foot ulceration, which often results in lower extremity amputations which is one of the most common complications associated with the disease [3]. The prevalence of diabetic foot ulcers among outpatient and inpatient diabetics in a rural Indian study was found to be 10.4% [1]. Diabetic foot ulcers frequently become infected and are a major cause of hospital admissions [2]. They also account for more than half of non-traumatic lower limb amputations in this patient population [3]. It has been shown that 49-85% of all diabetic foot related problems are preventable if appropriate measures are taken and can be achieved through a combination of good foot care, provided by a multidisciplinary diabetes care team, and appropriate education for both, people with diabetes and healthcare professionals [4]. All patients with diabetes are potentially at risk of diabetic foot, which can only be avoided by creating awareness about the importance of appropriate self-care [2].

Preventive and prophylactic foot care has been advocated to decrease patient morbidity, utilization of expensive resources, as well as the risk for amputations [5]. This includes identification of risk factors, patient education, and intensive podiatric care and has shown to be both cost-effective and cost-saving [3, 6].

The present study aims to assess the knowledge, attitude, and practice of diabetic patients as regards care of their own feet.

**MATERIALS AND METHODS**

This was a cross-sectional, unicentric study conducted on the inpatients in the department of Surgery at Adichunchanagiri

hospital and research centre, B. G. Nagara, Karnataka, India, from 1<sup>st</sup> Nov. 2016 to 31<sup>st</sup> Dec. 2016 and a total of 51 patients were enrolled. The patients were informed about the study and those who showed interest participated by providing their written consent. The required details were collected in a well-designed data collection form, which consists of patient demographic details, social and medical history, presenting illness and foot care habits.

The collected data were analyzed by using appropriate statistical tests. The relation between gender and knowledge, attitude and practices of diabetes patients were compared by using the Chi-square test at 95% confidence interval at  $p < 0.05$ . Data were expressed as mean with SD and Chi-square test used to find the level of significance.

**RESULTS**

Table 1, showed that out of 51 patients, 72.54% were male and 27.46% were female and 45.1% of the patients were in the age range 61-80 y. The mean SD of age was  $60.49 \pm 14.02$ . The mean SD of body weight of the patient was  $66.17 \pm 8.54$ . Majority of the patients 45.1% were farmers and 41.7% were illiterate, 23.53% were having co-morbidities, 11.76% were having a family history of diabetes, 41.17% were having a history of diabetes of less than 5 y and 19.62% patients had a history of diabetes of more than 10 y.

Information regarding the patients knowledge regarding foot care (table 2) revealed that 39.22% did not know correct foot hygiene practice, 45.1% stated that they do not know about ideal foot drying, 66.67% did not know what a person with diabetes should observe in their feet, and only 5.88% answered that comfortable and closed footwear is ideal. As regards nail care, 50.98% knew how to cut their nails correctly.

In terms of attitudes to prevent foot ulcers (table 3), most of the patients (62.75%) would put physical examination of the foot into practice if they received the necessary information to prevent

foot-related complications. When asked if they would engage in self-foot care practices 90.2% answered positively. Moisturizers were used by (3.92%) and various oils by (66.67%) to prevent their feet from becoming dry (85.29%) on a daily basis as part of foot care.

Regarding foot care to prevent chronic foot complications (table 4), 100% stated washing, 64.7% drying, 43.5% moisturizing; and 34.1% massaging feet is needed. In terms of the most frequently used footwear, 87.1% used open sandals, and more than half stated they always inspected their footwear before use (54.1%). When asked about the habit of cutting their nails, (91.8%) answered positively, (75.6%) cut their nail in a rounded shape

using a pointed-tip scissors (46.2%).

Table 5 shows the analysis of knowledge, attitudes, and practices in relation to gender. Results showed that men statistically had more knowledge on the right footwear to use and out of 37 men, 3 men wore comfortable and closed footwear, but 26 men were using other types of footwear but statistically not significant (P=0.890). Women showed they were more willing to include self-care practices in their routine (P=0.147). When it comes to foot care, 100% patients were washing their feet on a regular basis and females were interestingly involved in moisturizing (85.72%) and massaging (64.28%) their feet as compared to males, but statistically not significant (P=0.131).

**Table 1: Demographic details of the patients**

Variables	Number	%
<b>Gender</b>		
Male	37	72.54
Female	14	27.46
<b>Age range</b>		
20-40	4	7.84
41-60	20	39.22
61-80	23	45.10
>80	4	7.84
<b>Weight range</b>		
20-40	0	0
41-60	12	23.53
61-80	35	68.62
>80	4	7.85
<b>Occupation</b>		
Employed	2	3.93
Unemployed	18	35.29
Farmer	23	45.10
Business	8	15.68
<b>Education</b>		
Illiterate	21	41.17
Primary	24	47.05
Secondary	5	9.82
PUC	0	0
Degree	1	1.96
<b>Smoking history</b>		
Smoker	4	7.85
Past smoker	24	47.05
Non smoker	23	45.10
<b>Alcoholic history</b>		
Alcoholic	3	5.88
Past alcoholic	21	41.17
Non-alcoholic	27	52.95
<b>Family History</b>		
Yes	6	11.76
No	45	88.24
<b>Duration of diabetes</b>		
<5	21	41.17
05-10	20	39.21
>10	10	19.62

**Table 2: Knowledge of diabetes on preventive foot care of diabetic patients**

Variables	Number (N=51)	%
<b>Correct hygiene</b>		
• With cold water and regular soap	11	21.56
• With cold water only	12	23.52
• With warm water and neutral soap	8	15.68
• I don't know	20	39.22
<b>Ideal drying</b>		
• With a towel, without drying between the toes	13	25.49
• With a towel, drying between the toes	9	17.64
• No need to dry	6	11.76
• I don't know	23	45.1
<b>Observing your feet</b>		
• Only when there is callosity, tingling and numbness	7	13.73
• Coloration, temperature, blisters, callosity, wounds, tingling and numbness	2	3.92
• No need to observe feet	8	15.68

• I don't know	34	66.67
<b>Ideal Footwear</b>		
• Tight	1	1.96
• Loose	2	3.93
• Comfortable and closed	3	5.88
• Comfortable and open	11	21.56
• Any type	24	47.05
• I don't know	10	19.60
<b>Correct Nail Cutting</b>		
• Rounded	26	50.98
• Straight	2	3.93
• Either rounded or straight	4	7.84
• I don't know	20	39.22

Table 3: Attitudes towards preventing diabetic foot ulcers of patients

Variables	Number	%
<b>Would perform a physical examination</b>		
• Yes	32	62.75
• No	19	37.25
<b>Why perform a physical examination</b>	27	81.25
• To prevent foot related complications	6	18.75
• To detect changes in the feet		
<b>Would engage in self-care</b>		
• Yes	46	90.2
• No	5	9.8
<b>Why engage in self-care</b>	37	78.72
• To prevent foot related complications	10	21.28
• To detect changes in the feet		
<b>Would Use Moisturizer</b>		
• Yes	2	3.92
• No	49	96.08
<b>Why Use Moisturizer</b>	1	50
• To prevent feet from getting dry	1	50
• To ensure good appearance of feet		
<b>Would Use Oil</b>		
• Yes	34	66.67
• No	17	33.33
<b>Why use oil</b>	29	85.29
• To prevent feet from getting dry	5	14.71
• To ensure good appearance of feet		

Table 4: Foot care practices performed by diabetic patients

Variables	Number	%
<b>Foot care</b>		
• Wash	51	100
• Dry	43	84.30
• Oil	34	66.67
• Massage	17	33.03
<b>Types of habitually used footwear</b>		
• Closed and tight	2	3.92
• Open sandals	43	84.31
• Closed and soft	6	11.77
<b>Inspect footwear before use</b>		
• Always	9	17.64
• Sometimes	20	39.22
• Rarely	16	31.37
• Never	6	11.77
<b>Nail cutting</b>		
• Yes	47	92.16
• No	4	7.84
<b>Nail cut</b>		
• Rounded	26	50.98
• Straight	2	3.93
<b>Cutting instrument</b>		
• Pointed tip scissor	1	1.96
• Cutter or pen knife	2	3.92
• Rounded tip scissor	2	3.92
• Nail cutter	46	90.20

**Table 5: Relation between gender and knowledge, attitude and practices of people with diabetes patients**

Variables	Male (37)	Female (14)	P* value
<b>Types of footwear</b>			
• Tight	1(2.7%)	0 (0%)	0.890
• Loose	1(2.7%)	1(7.1%)	
• Comfortable and closed	2(5.4%)	1(7.1%)	
• Comfortable and open	6(16.2%)	5(35.7%)	
• Any type	16(43.24%)	9(64.28%)	
• I don't know	7(18.92%)	3(21.42%)	
<b>Would perform self-care</b>			
• Yes	32(86.48%)	14(100%)	0.147
• No	5(13.5%)	0(0%)	
<b>Foot care</b>			
• Wash	37(100%)	14(100%)	0.131
• Dry	33(89.18%)	10(71.43%)	
• Moisturize	22(59.46%)	12(85.72%)	
• Massage	8(21.62%)	9(64.28%)	

## DISCUSSION

In this study, we found that male patients (72.54%), age range 61-80 y (45.10%) and weight range 61-80 kg (68.62%) were mostly affected. Most of the patients were farmers, unemployed, illiterate, non-smoker and non-alcoholic [3]. In this survey, it showed that most of the patients were ignorant about the care of feet and did not have knowledge about correct foot hygiene, ideal drying method, how to observe feet for complications and about ideal footwear. Results from a similar study showed 39.22%, 45.1%, and 66.67% did not know about correct hygiene, ideal drying and observing foot respectively [7]. Most of the patients showed a good attitude about the foot self-care but they did not have much knowledge about it. A study conducted in Italy showed that more than 50% of the patients reported that they had not had their feet examined by their physician and 28% said that they had not received foot care education [8, 9]. Shah *et al.* noted that the feet of only one-third of diabetic patients (34.43%) are being regularly examined by primary health care physicians. However, most patients admitted receiving health education by their family physicians (85.29%) [10]. 17.64% patients inspected their footwear before using it. Most of them answered about the correct way of nail cutting (96.07%) and using proper nail cutting instrument (nail cutter 90.2%). They did not have any idea about the types of footwear to be used (any types 47.05%). As the patient himself/herself plays the crucial role in the prevention of diabetic foot disease, education on foot care is important [11].

It was also observed that there was a predominance of women regarding knowledge and practice of foot care in relation to men, which could be explained by the fact that women are more concerned with health, had a greater perception of the disease and used the health service more often. This finding is not considered a new fact and is in line with other studies on similar topics [8-11]. With regard to gender and knowledge, attitude and practices of people with diabetes mellitus to prevent diabetic foot ulcer, females were more engaged with foot care by using correct hygiene, inspecting foot, nail cutting and types of footwear used. The use of customized shoes reduced the development of new foot ulcers from 58% to 28% over one year of follow-up in a report [12].

Females were taking more care about their feet by using moisturizer and oils as compared to males, but statistically not significant ( $p=0.131$ ). Sex has shown no relationship regarding knowledge and practices of foot care [2]. But in a study conducted in India, it was shown that low scores for foot care knowledge were more common in women (78.5%) than in men (62.5%) [11]. Whereas in another study, multivariate analysis showed that age, years of schooling and sex were an independent determinant of the knowledge score in the respondents with type 2 Diabetes [13].

In our study, most of the patients were having poor knowledge in foot care practices and this view was also supported by the Nigerian and Pakistani studies where one-third to half of the patients were found to have poor foot care practices [13,14]. One of the most common reasons for neglect in foot care practice was that most of

the patients were illiterate and with low education. Similar findings were seen in Iranian and Pakistani studies [14, 15]. The association between low educational status as well as low diabetes awareness level was found with the poor practice of diabetic foot care, similar to another Pakistan study [10]. This suggests that education determines knowledge, awareness as well as the practice of foot care by diabetic patients [1].

## LIMITATION

A small number of interviewees because of the short period of time and inability to reassess the knowledge, attitude, and practices to prevent diabetic foot after educating them are the limitations of this study.

## CONCLUSION

The knowledge, attitude and practices of study participants on foot care to prevent diabetic foot ulcer were not sufficient. The result showed that patients had a good attitude towards self-care and self-examination of the foot. But with regard to practice, results showed that some patients were involved in self-care practices that are not sufficient, which could be related to a lack of knowledge. The knowledge, attitude and practices triad must be interconnected in order to achieve successful preventive foot care. After seeing the results it appears that it is mandatory to educate all the diabetic patients regarding knowledge, attitude, and practice to prevent diabetic foot.

## AUTHORS CONTRIBUTION

Dr. Gopal Teli, who conducted the study, collected data, reviewed literature and wrote the manuscript and done statistics.

Dr. B. G. Ponnappa contributed to research concept development, topic selection, questionnaire development and guided the research process and manuscript preparation.

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## CONFLICTS OF INTERESTS

The authors have no personal, professional, or ethical conflicts of interest in the publication of this study.

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