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# Knowledge and Practices Regarding Foot-Care among Diabetic Patients Residing in Meicheri Taluk, Salem, TamilNadu

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A B S T R A C T

**Background:** Diabetes mellitus is a major public health problem in India. The life time risk of developing a foot ulcer in DM is estimated to be 15%. The patients with foot problem spend 32.3% of the total income towards treatment. The objective of the study was to assess the knowledge and practices regarding foot care among diabetic and to estimate the association of the factors with knowledge and practices of foot care.

**Methodology:** This cross-sectional study was conducted among diabetes mellitus with more than 5 years duration living in and around Meicheri. Convenient sampling was followed. Sample size was estimated to be 160.

**Results:** Only 59.4% of patients had good knowledge regarding foot care. Only 26.9% of patients followed good foot care practices. In our study majority 80% belonged >50 years of age. About 31.9% were illiterate and 65% belonged to upper lower and lower middle socio-economic class in this study. Previous foot care advice reception has an association in knowledge regarding foot care but not with practicing it. Regular screening for blood sugar and other systemic illnesses is associated with foot care knowledge among patients. Type of drugs used by the patient is associated with foot care knowledge which is statistically significant.

**Conclusions:** Foot care advice received previously had a significant increase in practices, so that health education regarding diabetic foot care knowledge should be improved to prevent the diabetic foot ulcer morbidities.



## INTRODUCTION

Diabetes mellitus (DM) is a major public health problem with rising prevalence worldwide. Globally, in 2015 about 415 million people were known to have diabetes. This estimate is expected to increase to 642 million by 2040 [1]. Among diabetes mellitus, the lifetime risk of developing a foot ulcer is estimated to be 15% [2]. The most costly and feared consequence of a foot ulcer is limb amputation, which occurs 10 to 30 times more often in diabetic persons than in general population [3]. Diabetes mellitus contributes up to 8 of 10 non-traumatic amputations of which 85% follow a foot ulcer [4]. Prevention of diabetic foot ulceration is critical in order to reduce the associated high morbidity and mortality rates. The contributory factors like peripheral neuropathy, mechanical stress and peripheral vascular diseases work together to cause foot ulceration in patients with diabetes. The lack of protective sensation from sensory neuropathy leads to repeated trauma in an area of high pressure that result in ulceration. Although the end results of diabetic foot ulceration may be devastating, though the development of ulceration is preventable. Patient education regarding foot hygiene, skin care, nail care, preventive footwear and appropriate foot care administered by qualified professionals can reduce injuries that may lead to foot ulceration. In a South Indian study, it was found that patients without foot problems spent 9.3% of total income while those with foot problem had to spend 32.3% of their total income towards treatment [5].

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The cost burden is so high that this will lead to treatment non-adherence and financial burden [6]. The GDP (%) spent on medical care is so high [7]. The risk for developing foot ulcers is 25% high in patients with diabetes [8]. It is also reported that every 30 seconds, one lower limb amputation in diabetes patients is occurring around the world [9].

The specific objectives were

1. to assess the knowledge and practices regarding foot care among DM patients and
2. to estimate the association of various diabetes related factors with knowledge and practices of foot care.

## METHODOLOGY

This cross-sectional study was conducted at Meicheri, Salem, Tamil Nadu during February to March 2020. The respondents were 160 diabetic patients with more than 5 years duration. The sample size was calculated as 160 by using Epi-info (version 3.5.1) software package. We used 95% confidence interval and 5% absolute precision with 20% non-response rate. The exclusion criteria of this study were seriously ill and diabetic ketoacidosis patients. We used convenient sampling. The pre-structured questionnaire contains socio-demographic details, other factors and questions regarding knowledge and practices of foot care. The socioeconomic status was based on modified Kuppusamy classification.

### Ethics Approval:

The Data collection was done after getting approval from the Institutional Ethics committee by using pre-structured questionnaire. Love, beneficence and justice were followed in the conduct of the study.

**Data Analysis:** Data analysis was done using SPSS 12.0.1 software (SPSS Inc., Chicago, Illinois, USA) package.

**Table 1:** Socio Demographic characteristics of diabetic patients in our study done in Meicheri Taluk, Salem, Tamil Nadu.

| Variables | Frequency (N) | Percentage (%) |
|---|---|---|
| **1. Age in years (n = 160)** | | |
| <40 | 5 | 3.1 |
| 40-50 | 27 | 16.9 |
| 51-60 | 44 | 27.5 |
| >60 | 84 | 52.5 |
| **2. Gender** | | |
| Male | 89 | 55.6 |
| Female | 71 | 44.4 |
| **3. Marital status** | | |
| Married | 157 | 98.1 |
| Unmarried | 2 | 1.3 |
| Divorced | 1 | 0.6 |
| **4. Type of family** | | |
| Nuclear family | 115 | 71.9 |
| Joint family | 33 | 20.6 |
| Three generation family | 11 | 6.9 |
| **5. Education of the patient** | | |
| Illiterate | 51 | 31.9 |
| Primary school | 42 | 26.3 |
| Middle school | 28 | 17.5 |
| High school | 26 | 16.3 |
| Higher secondary | 5 | 03.1 |
| Graduate degree | 7 | 04.4 |
| PG / professional degree | 1 | 06.0 |
| **6. Socioeconomic status** | | |
| Upper class | 2 | 01.3 |
| Upper middle | 29 | 18.1 |
| Lower middle | 48 | 30 |
| Upper lower | 56 | 35 |
| Lower class | 25 | 15.6 |
| **7.Duration of Diabetes Mellitus in years** | | |
| 5 to 10 | 114 | 71.3 |
| 11 to 20 | 38 | 23.8 |
| >20 | 08 | 05 |

**Table 2:** Awareness and knowledge of the respondents about foot care of diabetic patients in our study done in Meicheri Taluk, Salem, Tamil Nadu.

| Variables Related to Foot Care Awareness (n = 160) | Knowledge Score | | Practice Score | |
|---|---|---|---|---|
| | Good n (%) | Poor n (%) | Good n (%) | Poor n (%) |
| Daily inspection of feet | 56 (35) | 104 (65) | 29 (18.1) | 131 (81.9) |
| Inspection of feet with mirror | 5 (3.1) | 155 (96.9) | 2 (1.3) | 158 (98.8) |
| Daily washing of feet | 153 (95.6) | 7 (4.4) | 93 (58.1) | 67 (47.9) |
| Washing with lukewarm water | 19 (11.9) | 141(88.1) | 14 (8.8) | 146 (99.3) |
| After washing, drying the skin between toes | 100 (62.5) | 60 (37.5) | 30 (18.8) | 130 (81.3) |
| Bare foot walking outside house | 143 (89.4) | 17 (10.6) | 143 (89.4) | 17 (10.6) |
| Bare foot walking inside house | 25 (15.6) | 135 (84.4) | 15 (9.4) | 145 (90.7) |
| Cutting the nails | 128 (80) | 32 (20) | 154 (96.3) | 6 (3.8) |
| Changing slippers every year | 41(25.6) | 119 (74.4) | 64(40.0) | 96 (60.0) |
| Importance of applying oils or lotions to foot | 46 (28.7) | 114 (71.3) | 30 (18.8) | 130 (81.2) |

**Table 3:** Association of factors with knowledge and practices regarding diabetic foot care in our study done in Meicheri Taluk, Salem, Tamil Nadu.

| Factors related to foot care (n = 160) | Knowledge Score | | p-value | Practices Score | | p-value |
|---|---|---|---|---|---|---|
| | Good N (%) | Poor N (%) | | Good N (%) | Poor N (%) | |
| **I. Duration of Diabetes Mellitus in years** | | | | | | |
| 5 to 10 | 67 (58.8) | 47 (41.2) | 0.650 | 28 (24.6) | 86 (75.4) | 0.064 |
| 11 to 20 | 22 (57.9) | 16 (42.1) | | 10 (26.3) | 28 (73.7) | |
| > 20 | 6 (75) | 2 (25) | | 5 (62.5) | 3 (37.5) | |
| **II. Past ulcer** | | | | | | |
| Yes | 13 (65) | 7 (35) | 0.584 | 6 (30) | 14 (70) | 0.736 |
| No | 82 (58.6) | 58 (41.4) | | 37 (26.4) | 103 (73.6) | |
| **III. Foot care advise received** | | | | | | |
| Yes | 8 (66.7) | 4 (33.3) | 0.03* | 5 (41.7) | 7 (58.3) | 0.055 |
| No | 78 (56.1) | 61 (43.9) | | 33 (23.7) | 106 (76.3) | |
| Don't know | 9 (100) | 0 | | 5 (55.6) | 4 (44.4) | |
| **IV. Screening test for foot ulcer done previously** | | | | | | |
| Yes | 20 (83.3) | 4 (16.7) | 0.01* | 10 (41.7) | 14 (58.3) | 0.132 |
| No | 74 (56.1) | 60 (43.9) | | 33 (26.8) | 101 (73.2 | |
| **V. Type of drug used by the patients** | | | | | | |
| Oral hypoglycemic | 89 (58.6) | 63 (41.4) | 0.03* | 39 (25.7) | 113 (74.3) | 0.06 |
| Insulin | 0 | 2 (100) | | 0 | 2 (100) | |
| Combined | 6 (100) | 0 | | 4 (66.7) | 2 (33.3) | |

*p value < 0.05 is considered statistically significant

## RESULTS:

More than half of the patients were above 60 years of age (n = 84). Gender distribution shows more male (89, 55.6%) as compared to female. Nearly 72% (115) of them live as nuclear families. About 31.9% (51) are illiterate. About 65% (104) of patients belonged to lower middle and upper lower socio-economic class. About 71% (114) have 5-10 years duration of diabetes (Table 1).

About 35% (56) were aware of the importance of daily inspection of foot but only 18% (29) practiced it. Unfortunately, inspection of feet with mirror was known by 3.1% (5) and practised by 1.3% (2) only. Washing of feet with lukewarm water was known by 12% (19) and only 9% (14) practised. Drying the skin between toes was known to 62.5% (100) and only 18.8% (30) follow the same. Ninety percent of the diabetes patients were aware and practised wearing footwear when they were outside the house. Nearly, fifteen percent of the respondents (25) were aware that footwear was essential when they were inside the house but only 9.4% (15) practised it. About 80% (128) had a good knowledge related to cutting of nails regularly. Nearly, 97% (154) followed it. About 28.7% (46) had knowledge about applying oils or lotions to prevent dryness of foot and 19% (30) followed it (Table 2).

Table 3 shows previous foot care advice reception has a statistically significant association in knowledge regarding foot care but not with practicing it. Regular screening for sugar and other systemic screening for illnesses is significantly associated with foot care knowledge among patients. Type of drugs used by the patient is associated with foot care knowledge which is statistically significant.

## DISCUSSION

The result of our study showed that only 59.4% of patients had good knowledge regarding foot care. Only 26.9% of patients followed good foot care practices. In our study majority 80% belonged >50 years of age. About 31.9% were illiterate and 65% belonged to upper lower and lower middle socio-economic class in this study. Previous foot care advice reception has an association in knowledge regarding foot care but not with practicing it. Regular screening for sugar and other systemic screening for illnesses is associated with foot care knowledge among patients. Type of drugs used by the patient is associated with foot care knowledge which is statistically significant.

In Hemin et al study only 15% had good knowledge and 15% had good foot care practices [7]. In Sutariya PK et al., study only 23% patients had good knowledge, 50% patients had satisfactory knowledge and 27% had poor knowledge about diabetic foot care. About half of the patients had poor practice [10]. Similar to the above two studies, the knowledge and practice components differ in our study too. We strongly hope that the difference will be taken care of when done with a bigger sample size. A qualitative in-depth interview would guide us in understanding the difference better and generating newer hypothesis.

Sutariya PK et al., study showed that 61.1% of patients belonged to the age group of 51-70 years [10]. This is similar to L.N.D, Murty P study with more male (Male 54.7%) [11]. Our study also shows a male preponderance as explained by other studies. In our study, 3/4th had 5 to 10yrs of DM. In Sutariya PK et al., study, 53.4% had more than 10

years duration [10]. The association between knowledge and practice score was significant in Sutariya PK et al., study who had a lower sample size but we could not establish the same with a comparatively higher sample size. This could probably be attributed to the greater experience gained by the patients having the illness for a longer duration. Secondly, the educational status among our respondents was poor as 75% of them were illiterate, completed primary and middle school education only.

Thus, patient education on the prevention of foot ulceration is imperative and should be incorporated into the routine care of patients with diabetes both in the hospital and community. Time must be allotted to communicate information and education during working sessions [12]. Furthermore, the education of the physician is highly imperative to complement and reinforce the behaviors of the patient with regards of foot care, they need to learn and imbibe the skills about risk assessment [13].

The results of the study are a wakeup call on the physician and nurses to establish a patient and physician friendly educational programme that will enhance and sustain the good knowledge of foot care [14]. Strategies to disseminate foot care knowledge when not formulated in time, it may lead to many non-preventable diabetic foot complications [15].

## CONCLUSION

More than sixty percent of the patients with diabetes foot ulcer were more than 60 years old. About 35% were aware of the importance of daily inspection of foot but only 18% practiced it. Drying the skin between toes was known to 62.5% and 18.8% follow the same. Ninety percent of the diabetes patients were aware of wearing footwear when they were outside the house and practised it. About 80% had a good knowledge related to cutting of nails regularly. Nearly, 97% followed it. Foot care advice reception has an association in knowledge regarding foot care but not with practicing it. Regular screening for sugar and other systemic screening for illnesses is associated with foot care knowledge among patients. Type of drugs used by the patient is associated with foot care knowledge which is statistically significant.

### Recommendation:

Patient education in the form of posters, power point presentation regarding foot care practices and IEC materials will remain a cornerstone in the development of knowledge and practices regarding foot care. A continuous systematic approach to constantly remind them about foot care will bring about a behaviour change in them and in turn reduce foot ulcer complications in diabetes.

### Competing interests

The authors declare that they have no competing interests.

### Authors' Contributions

Principal Investigator: SD; Senior author: KCVG; Conception and design: SD, MDM, SR, JGK; Data collection: SD, MDM, SR, JGK; Development of data capture tool: SD, MDM, SR, JGK, KCVG; Data analysis and interpretation: SD, MDM, SR, JGK, KCVG; Preparation of first draft; SD, JGK; Critical review and approval of final draft: all authors.

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