

## SELF-REPORTED PERCEPTIONS TOWARDS DIABETIC FOOT CARE AMONG PATIENTS SEEKING CARE AT A TERTIARY CARE TEACHING HOSPITAL IN RURAL HARYANA

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### ABSTRACT

To ascertain the current status of knowledge and practices towards foot care among diabetic patients seeking care at a tertiary care teaching hospital. The mean age of the patients was  $47.6 \pm 5.3$  years. Almost 96% patients were having type 2 DM. Patients had multiple risk factors for DM foot ulcer. The mean knowledge and practice scores were  $5.47 \pm 3.2$  and  $5.42 \pm 2.4$  respectively. Out of total, 32.2% had good knowledge of diabetic foot care (score  $\geq 70\%$ ), 25.1% had satisfactory score (score 50–69%) and 42.7% had a poor knowledge of diabetic foot care (score  $<50$ ). Only 51 (12.1%) had good practice of diabetic foot care (score  $\geq 70\%$ ), 178 (42.2%) had satisfactory score (score 50–69%) and 193 (45.7%) had a poor practice of diabetic foot care (score  $<50$ ). Illiteracy and low socioeconomic status were significantly associated with lower the knowledge and practice scores.

**KEYWORDS :** Diabetes mellitus, Diabetic Foot Care, Foot ulcer, Knowledge, Practice, Perceptions

India is known as the diabetes capital of the world with more than 40 million people with diabetes. Diabetes mellitus is a multifaceted disease and foot ulceration is one of its most common complications. The condition is presently afflicting 194 million people worldwide and is estimated to rapidly increase to 333 million people in 2025 (Bartus, 2004). The incidence of foot ulcers among people with diabetes ranges from 8% to 17% (Diabetes Fact Sheet, 2009). Foot ulcers can cause severe disability and hospitalization to patients and considerable economic burden to families and health systems (Crawford, 2007; Margolis, 2011). Infection, occurring in about half of the diabetic foot ulcers, is a further complication (Stockl, 2004; Dang, 2003).

Diabetic foot syndrome is one of the common and most devastating preventable complications of diabetes mellitus (DM). The various factors contributing to this syndrome are peripheral sensory neuropathy, improper footwear, lack of patient knowledge about foot care and uncontrolled diabetes. The lifetime risk of a person with diabetes developing a foot ulcer could be as high as 25%, and it is believed that every 30 seconds a lower limb is lost somewhere in the world as a consequence of diabetes

(International Diabetes Federation, 2005).

In addition to causing pain and morbidity, foot lesions in diabetic patients have substantial economic consequences, beside the direct costs of foot complications. Certain indirect costs involved are loss of productivity, individual patients' and family costs and loss of health related quality of life. 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 (Jeffcoate, 2005; Eregie, 2008) especially in low income economy characterized by inadequate healthcare facilities and lack of skilled healthcare personnel. Hence, this study was planned to study the current status of knowledge and practices towards foot care among diabetic patients seeking care at a tertiary care teaching hospital of rural Haryana.

### MATERIALS AND METHODS

The current cross-sectional study was planned and executed by the Department of General Surgery in collaboration with Department of Community Medicine, Maharishi Markandeshwar Institute of Medical Sciences during February 2014 to November 2014. The sample size was calculated ( $n = 1.962 p^*q/d^2$ ) with an anticipated

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proportion of subjects assuming correct knowledge of diabetic foot care as 50%, 5% absolute precision, 95% confidence interval and 10% non-response error – as 422 participants. Consented patients diagnosed of type I and II diabetes for at least six months and who had never developed foot ulcers were included in the study. DM patients that were unable to answer the questions because of altered mental state were excluded from this study.

Patients with diabetes seeking care at outpatient department of General Surgery, MM Institute of Medical Sciences constructed the sampling frame. MM Institute of Medical Sciences is a state of the art tertiary care teaching institution (UG and PG) established in rural outskirts of Ambala to provide super specialty care to underserved population. Department of General Surgery, is serving primarily patients mainly from lower socio-economic strata of community not only from North-Eastern edge of Haryana but also from neighboring states. On an average 80-100 patients seek care at Department of General Surgery, MM Institute of Medical Sciences on outpatient (OPD) basis per day. So this institution provided us a perfect base to plan and execute this study.

A pre-tested structured previously used questionnaire used as study tool. This tool was developed from the recommendation of the American College of Foot and Ankle Surgeons and the Diabetes (American Diabetes Association, 1998; Pollock, 2004). The questionnaire consisted of 11 questions on knowledge of foot care and current self-care practice respectively. The questionnaire was pilot tested on 20 study subjects and amended for clarity with the addition of some answer options and was modified accordingly. All interviews and examinations were conducted by single person.

Permission of Institutional ethics committee (IEC) was sought before the commencement of the study. Informed consent was obtained from the study participants. All the questionnaires were manually checked and edited for completeness and consistency and were then coded for computer entry. After compilation of collected data, analysis was done using Statistical Package for Social Sciences (SPSS), version 20 (IBM, Chicago, USA). The results were expressed using appropriate statistical methods.

Knowledge and practices to foot care were analyzed and the knowledge and the current practice score of each respondent was ascertained. Their knowledge and practices score were classified as good, satisfactory and poor depending upon the score. If score  $\geq 70\%$  (8–11), it was regarded as good, if score was 50–69% (6–7) it was regarded as satisfactory and if score was less than 50% (<6) it was regarded as poor. Student t test was used to compare the means of knowledge and practice scores among study subjects. A two-tailed  $P < 0.05$  and  $p < 0.001$  was considered statistically significant and highly significant respectively.

## RESULTS

A total of 422 questionnaires were collected and analyzed for various study parameters. The mean age of the patients was  $47.6 \pm 5.3$  years. Majority (61.1%) of patients were less than fifty years of age. Males 272 (64.5%) outnumbered female patients 150 (35.5%). Most of the study subjects were illiterate. Majority of the patients belonged to lower class of socio-economic status according to modified BG Prasad's classification. Almost 96% patients were having type 2 DM. Patients had multiple risk factors for DM foot ulcer. (Table 1)

The mean knowledge score was  $5.47 \pm 3.2$ . The range of the knowledge score obtained in this study was 0–11 out of maximum possible score of 11. Almost eighty percent i.e. 332 (78.7%) of the DM patients were unaware that smoking causes poor circulation of the feet, 286 (67.8%) were unaware of the first thing to do when they found redness/bleeding between their toes. Majority (63.7%) of the respondents were unaware of the importance of inspecting the inside of the footwear for objects or torn lining. (Table 2)

On classifying the knowledge score of the study participants, 136 (32.2%) had good knowledge of diabetic foot care (score  $\geq 70\%$ ), 106 (25.1%) had satisfactory score (score 50–69%) and 181 (42.7%) had a poor knowledge of diabetic foot care (score <50).

The mean practice score was  $5.42 \pm 2.4$ . The range of the current practice score obtained in this study was 2–10 out of maximum possible score of 11. Merely 36% regularly inspected their feet, (52.1%) regularly wash their feet with

**Table 1: Profile of the Study Subjects (n=422)**

<b>Variables</b>	<b>N (%)</b>
<b>Age (yrs)</b>	
<50	258(61.1)
≥50	164(38.9)
<b>Gender</b>	
Female	150(35.5)
Male	272(64.5)
<b>Literacy status</b>	
Illiterate	196(55.7)
Literate	156(44.3)
<b>Socio- economic status (Modified BG Prasad's classification)</b>	
Social Class I- Upper class	8 (1.9%)
Social Class II- Upper middle	37 (8.8%)
Social Class III- Lower-middle	101 (23.9%)
Social Class IV- Upper Lower	114 (27.0%)
Social Class V- Lower class	162 (38.4%)
<b>Type of DM</b>	
Type 1	17 (4.03%)
Type 2	405 (95.97%)
<b>Presence of risk factor for DMfoot ulcer*</b>	
Neuropathy	155(36.7%)
Poor vision/retinopathy	138(32.7%)
Vasculopathy /absent dorsalis - pedis pulsation	67(15.9%)
Foot deformity	51(12.1%)
* Multiple responses permitted	

warm water and (64.9%) inspect the inside of their footwear (Table 3).

On classifying the practice score of the study participants, only 51 (12.1%) had good practice of diabetic foot care (score ≥70%), 178 (42.2%) had satisfactory score (score 50–69%) and 193 (45.7%) had a poor practice of diabetic foot care (score <50). On analyzing possible association of demographic factors on knowledge and practice of foot care, illiteracy and low socioeconomic status were significantly associated with lower the knowledge and practice scores. Higher knowledge and practice scores were observed among literates and upper socioeconomic status (Table 4).

## DISCUSSION

Foot problems constitute a significant part of morbidity in diabetics in India. There are some striking dissimilarities between foot problems in Western countries and India (Pendse, 1994). It is really regrettable that surgical intervention or amputation is frequently required in our country for a complications of diabetic foot, which is entirely preventable. Hence, an insight to knowledge and practices towards foot care among diabetic patients is essential.

Our study showed that a greater proportion of diabetic patients had a poor knowledge of diabetic foot care. We observed that 78.7% of the DM patients were unaware that smoking causes poor circulation of the feet, 67.8% were unaware of the first thing to do when they found

**Table 2 : Responses Towards Knowledge of Foot Care Among Study Subjects**

Questions related to knowledge of foot care	Correct (%)	Wrong/ Don't know(%)
DM patients should take medication regularly because they liable to get DM complication	403 (95.5%)	19 (4.5%)
DM patients should look after their feet because they may not feel a minor injury to their feet	196 (46.4%)	226 (53.6%)
DM patients should look after their feet because wounds and infection may not heal quickly	235 (55.7%)	187 (44.3%)
DM patients should look after their feet because they may get a foot ulcer	238 (56.4%)	184 (43.6%)
DM patients should not smoke because smoking causes poor circulation affecting the feet	90 (21.3%)	332 (78.7%)
How often do you think you should inspect your feet	353 (83.6%)	69 (16.4%)
If you found redness/bleeding between your toes what is the first thing you do	136 (32.2%)	286 (67.8%)
Even if you have never had a corn/ hard skin lesion, would you do if you had one	125 (29.6%)	297 (70.4%)
How often do you think your feet should be washed	401 (95.0%)	21 (5.0%)
What temperature of water do you think you should wash your feet in	220 (52.1%)	202 (47.9%)
How often do you think you should inspect the inside of your footwear for objects or torn lining	153 (36.3%)	269 (63.7%)
<i>Figures in parenthesis indicate percentage</i>		

**Table 3: Responses Towards Practice of Foot Care Among Study Subjects**

Questions related to practice of foot care	Yes (%)	No/don't know (%)
Do you Inspect feet regularly	152 (36.0%)	270 (64.0%)
Do you wash feet regularly	328 (77.7%)	94 (22.3%)
Do you wash feet with warm water	220 (52.1%)	202 (47.9%)
Do you trim toe nails straight across	106 (25.1%)	316 (74.9%)
Do you measure your feet size when last you bought footwear	33 (7.8%)	389 (92.2%)
Do you received advice when last you bought footwear	28 (6.6%)	394 (93.4%)
Did you ever inspect inside of footwear	274 (64.9%)	148 (35.1%)
Do you regularly walk barefoot	168 (39.8%)	254 (60.2%)
Do you clean nails with sharp instrument	160 (37.9%)	262 (62.1%)
Do you add irritants to water before feet cleaning	103 (24.4%)	319 (75.6%)
Do you wear elasticated hosiery	8 (1.9%)	414 (98.1%)
<i>Figures in parenthesis indicate percentage</i>		

redness/bleeding between their toes. 63.7% of the respondents were unaware of the importance of inspecting the inside of the footwear for objects or torn lining. These deficiencies arises from lack of awareness about proper knowledge to diabetes. Another two studies from Iran and

Pakistan are in cohort with findings of the present study (Khamseh, 2007; Hasnain, 2009).

On analyzing possible association of demographic factors on knowledge and practice of foot care, we observed that illiteracy and low socioeconomic status were

**Table 4: Association of Various Demographic Factors on Perceptions of Foot Care**

Demographic variables	Knowledge score	Level of significance	Practice score	Level of significance
<b>Age (yrs)</b>				
<50	5.90	0.57	5.73	0.77
=50	5.68		5.69	
<b>Gender</b>				
Female	5.53	0.42	5.60	0.45
Male	5.62		5.78	
<b>Literacy status</b>				
Illiterate	5.33	0.002*	5.39	<0.001**
Literate	6.48		6.15	
<b>Socioeconomic Status (Modified BG Prasad's classification)</b>				
Social Class I- Upper class	6.32	0.006*	6.08	0.004*
Social Class II- Upper middle	5.21		5.33	
Social Class III- Lower-middle	5.02		5.06	
Social Class IV- Upper Lower	4.85		4.67	
Social Class V- Lower class	4.26		4.12	

\*Statistically significant, P<0.05; \*\*Statistically highly significant p<0.001

significantly associated with lower the knowledge and practice scores. Higher knowledge and practice scores were observed among literates and upper socioeconomic status. The knowledge of appropriate foot care has been suggested to be positively influenced by patient education which in turn reduces the risk of foot ulceration and amputation in high-risk diabetics (Singh, 2005). Need for health education to sustain the good knowledge and practice of foot care in order to reduce risk of diabetic foot ulceration has been estimated by another study from Pakistan (Viswanathan, 1999). Probable explanation can be given to support this observation as educated patient are able to read and understand well the educational supportive materials and also use information technology to obtain more information about the disease.

This deficient knowledge can be attributed to poor communication between the doctors and the patients and also lack of counselling by the doctors and nurses as result of busy clinic schedule. Very low doctor-patient ratio can be held responsible for this. Proper time must be allotted to communication, information and education during doctor patient encounter. Health education is highly imperative to complement and reinforce the behavior of patient with

regards to foot care; they need to learn and imbibe the skills of risk assessment.

This study has several strengths. First, we have identified current status of knowledge and practices towards foot care among diabetic patients. In-depth analysis of this aspect has not been closely investigated by many experts in the field. No such study is available in the literature from the state of Haryana. Perceptions to foot care has remained a less explored entity but very important aspect which is neglected by researchers in medical field. Second, the current study covered an adequate sample size. Third, all the investigations were conducted by authors of the study only, which creates a sense of uniformity. Fourth, we have used a good instrument to explore perceptions towards foot care among diabetic patients.

The study has some limitations as well. Some may argue that the results obtained may not be generalized. I agree because these findings are based on a single centre study. Multicentric studies need to be carried out. Second, this is a clinic-based study. Hospital based studies cannot provide true picture of diabetic foot care knowledge and practices of the community. Third, tool used in the study is not validated in this (Haryanvi) population.

## CONCLUSION

The findings of this study highlight that knowledge and practice of foot care are closely associated with literacy status and socioeconomic conditions of the target population. There is a need for a joint effort on part of the health care providers as well as communities to fill the knowledge-practice gap and to receive education about foot care so as to sustain the good knowledge and practice of foot care in order to reduce risk of diabetic foot ulceration.

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