

Prospective study on the knowledge and practice of foot care among diabetic patients

Meghana Manjunath¹, Nandini T.^{2*}

²Department of Pharmacology, ^{1,2}Sri Siddhartha Medical College, Tumkur, Karnataka, India

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***Correspondence:**

Dr. Nandini T.,

Email: meghana3199@gmail.com

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ABSTRACT

Background: The magnitude of diabetic foot ulcers (DFUs) and the amputation rates due to DFUs are high in India. Proper diabetic foot care can minimize these rates. Although numerous such studies have been done, reinforcement of awareness to practice diabetic foot care is necessary to reduce the incidents of DFUs.

Methods: 134 voluntary participants from SSMC, Tumkur and Karnataka Institute of Endocrinology and Research, Bangalore were included following ethical clearance. The patients were requested to fill the validated knowledge and practice questionnaire which were presented to them in their own language. Demographic details of the participants were also collected. The responses were recorded and statistically analyzed. A score of >70% was gauged as good, 50 to 70% as satisfactory and <50% as poor.

Results: Of the 134 participants, 73.13% had good knowledge on foot care, 22.8% had good foot care practice and 73.13% had a satisfactory practice score. Patients with history of foot ulcer had a mean score (\pm SD) of 12.75 (\pm 1.91) knowledge score and 47.75 (\pm 6.05) practice score which is lower compared to those without history of ulcers, 13.86 (\pm 2.37) and 55.40 (\pm 6.88) respectively. Patients from urban and rural areas had about the same mean scores, 13.51 (\pm 2.50), 54.98 (\pm 6.83) and 13.30 (\pm 2.60), 54.73 (\pm 7.49) (knowledge, practice score) respectively.

Conclusions: Foot care among diabetics is only satisfactory and has to be improved. Knowledge is the key to better practice so early diagnosis, repeated counselling, regular follow ups and good sugar control is necessary to reduce incidents of DFUs.

Keywords: Knowledge, Practice, Self-care, Diabetic foot ulcer

INTRODUCTION

The magnitude of diabetic foot ulcers (DFUs) and the amputation rates due to DFUs are high in India.¹ According to a study, 15% of diabetics get DFU. The same study also suggests that out of 62 million diabetics in India, 25% get DFUs, 50% of which get infected and require hospitalization and 20% require amputation.²

Diabetic foot is one of the most significant and devastating complications of diabetes, and is defined as a

foot affected by ulceration that is associated with neuropathy and/or peripheral arterial disease of the lower limb in a patient with diabetes.³ Triad of angiopathy, neuropathy and trauma makes diabetics vulnerable to DFUs.⁴

If proper and aggressive treatment is not provided, the ulcer can undergo necrosis and progress to gangrene finally leading to limb amputation.⁵ Limb amputation brings along various socioeconomic consequences for the patient such as loss of productive hours due to prolonged hospitalization, permanent loss of income due to

disability, decreased social acceptance etc. with practice of proper prevention guidelines and timely treatment, 85% of these amputations can be avoided.^{5,6}

Management and treatment of diabetes is very expensive, this is because of its chronic nature and the associated complications. When compared to non-diabetic people the medical expenses for diabetic patients are 2 to 4 times more.⁷ Approximately 5.7 years of an average patient's income is required for complete DFU care.² Therefore, prevention is important for both monetary and health matters. Proper diabetic foot care can minimize the incidence of DFU. People with poor knowledge and practice regarding diabetic foot care are known to have a higher incidence.⁷ Simple health education measures and awareness can improve both the knowledge and practice regarding diabetic foot care.⁸ American Diabetic Association has defined self-management education as the process of providing, the knowledge and skill that is needed to perform self-care, manage crises and make life style changes for the diabetics. Education is more likely to be effective only when we know the characteristics of the patient in terms of their knowledge and practice. Although numerous such studies have been done, reinforcement of awareness to practice diabetic foot care is necessary to reduce the incidents of DFUs.

METHODS

A total of 134 voluntary participants from Sri Siddhartha Medical College, Tumkur and Karnataka Institute of Endocrinology and Research, Bangalore were included in the study from August 2019 to October 2019. The study protocol, informed consent form and the questionnaire were approved by the institutional ethics committee.

The patients were requested to fill the validated knowledge and practice questionnaire. These questionnaires were presented to them in their own language.^{5,9,10} The responses were recorded in microsoft excel and statistically analyzed using SPSS (version 18).

The demographic details of the participants, such as age, gender and urban or rural residence were collected. Other data like duration of diabetes, history of previous ulcers was also included.

The knowledge questionnaire consisted of 18 yes or no questions. These questions were framed consulting the validated questionnaires used in 2 different studies - Hasnain and Sheikh, Knowledge and practices regarding foot care in diabetic patients visiting diabetic clinic in Jinnah Hospital, Lahore and Sutariya and Ashish Kharadi, Knowledge and practice of foot care among the patients of diabetic foot: a hospital based cross-sectional study.^{5,11} The knowledge score was determined by the proportion of correct answers. A score more than 70% (13-18 correct answers) was taken to be good. A score between 50% to 70% (9-12 correct answers) was accessed as satisfactory. Those with score less than 50%

(less than 9 correct answers) were considered to have poor knowledge.

The Nottingham assessment of functional foot care was used to assess the practice of foot care. It was proved to be valid and reliable to assess diabetic foot care behaviour.¹² The responses were recorded on a categorical scale of (0 to 3) according to frequency of various practices. The scores were then totalled and categorized as good, satisfactory and poor practice. Score more than 70% (more than 61) was taken as good, (50-70% (43 to 60) as satisfactory and less than 50% (less than 43) as poor.

RESULTS

The study enrolled 134 participants, of the 134, 59.7% were males and 40.3% females. Table 1, gives the cross tabulation of age and gender of participants. Most participants were aged between 45 and 55 (Table 1).

Table 1: Cross tabulation of age and gender of participants.

Age group (in years)	N	Gender		Total
		Male	Female	
<45	N	5	6	11
	%	6.3	11.1	8.21
45-55	N	26	15	41
	%	32.5	27.8	30.60
55-65	N	17	14	31
	%	21.3	25.9	23.13
65-75	N	25	15	40
	%	31.3	27.8	29.85
≥75	N	7	4	11
	%	8.8	7.4	8.21
Total	N	80	54	134

44 of the total participants resided in rural areas and the rest 90 in urban areas. The mean (\pm SD) duration of diabetes was found to be 12.91 (\pm 7.94).

Of the 134 participants, 73.13% had good knowledge on foot care, 22.8% had good foot care practice and 73.13% had satisfactory practice scores. The average knowledge and practice score were 13.76 (\pm 2.35) and 54.39 (\pm 7.86). Table 2, shows the distribution of scores.

Table 2: Distribution of scores.

Variables	Good (%)	Satisfactory (%)	Poor (%)
Knowledge	73.13	24.62	2.23
Practice	22.38	73.13	4.47

Patients from urban and rural areas had almost the same mean scores for both knowledge and practice. Table 3, shows the same.

The gender of participants had no association with the knowledge scores whereas there was significant association with practice scores. Females had higher mean (\pm SD), 55.13 (\pm 7.04), than males who had 53.89 (\pm 8.38). This has also been represented in (Table 4).

Table 3: Distribution of scores among urban and rural populations.

Variables		Knowledge	Practice
Urban	Mean	13.51	54.98
	SD	2.50	6.83
Rural	Mean	13.30	54.73
	SD	2.60	7.49

Table 4: Distribution of scores based on gender.

Variables		Knowledge	Practice
Male	Mean	13.70	53.89
	SD	2.54	8.38
Female	Mean	13.85	55.13
	SD	2.06	7.04

Patients with history of foot ulcers which includes those presenting with ulcers have lower scores than those with no history of ulcers. Patients with history of ulcers few years back, have good knowledge and practice scores, 16.18 (\pm 1.40) and 60.55 (\pm 6.28) respectively. Table 5 shows the average scores of those with and without history of ulcers.

Table 5: Average scores of those with and without history of ulcers.

Variables		Knowledge	Practice
H/O ulcer	Mean	12.75	47.75
	SD	1.91	6.05
NO H/O ulcer	Mean	13.86	55.4
	SD	2.37	6.88

Patients who have had diabetes for (25-30) years have higher knowledge and practice scores. Diabetic foot being a long-term complication, this group includes most of those who have had foot ulcers in the past. Their mean knowledge score is 14.25 (\pm 1.71) and practice score is 56.00 (\pm 7.62). These patients also mostly belonged to the age group of 65-75 who according to age groups have 14.80 (\pm 1.60) and 56.23 (\pm 6.92) mean knowledge and practice score respectively. The mean scores of those with diabetes more than 30 years is lower than the rest, that is knowledge score is 12.33 (\pm 2.08) and practice score is 51.67 (\pm 8.50). These patients belonged to older age groups most being >75 years. Patients aged more than 75 years, had the lowest average scores of 12.73 (\pm 2.00) and 47.18 (\pm 6.00). These low scores were majorly pertaining to old age-related problems like inability to perform self-care, forgetfulness etc. The recent diabetics who have had diabetes for <5 years, have a relatively higher mean score than those who have had diabetes for 5-20 years. Their mean scores are 14.32

(\pm 1.94) and 55.07 (\pm 6.19), knowledge and practice respectively. Tables 6 and 7 show the mean score according to age and duration of diabetes.

Table 6: Distribution of scores based on age groups.

Age group (in years)	N	Knowledge		Practice	
		Mean	SD	Mean	SD
<45	11	13.45	2.50	54.55	7.63
45-55	41	13.22	2.88	54.12	9.43
55-65	31	13.61	2.09	54.87	6.17
65-75	40	14.80	1.60	56.23	6.92
>75	11	12.73	2.00	47.18	6.00

Table 7: Cross tabulation of duration of DM and scores.

Duration of diabetes	Knowledge		Practice	
	Mean	SD	Mean	SD
<5	14.32	1.94	55.07	6.19
5-10	13.82	2.56	54.48	10.15
10-15	13.13	2.85	52.04	6.92
15-20	13.91	1.88	55.00	6.61
20-25	13.55	2.54	55.35	8.47
25-30	14.25	1.71	56.00	7.62
>30	12.33	2.08	51.67	8.50

DISCUSSION

This study shows that although majority of the participants that is 73.13% have good knowledge on diabetic foot care, only a small proportion have good practice. These percentages and finding were similar to a study previously done in Philippines.⁴

Majority of the participants were aware about the importance of taking medications regularly. Almost all the participants washed their feet multiple times in a day but this due to cultural practices that exist in India. They weren't aware of its importance. Similarly, majority of those who moisturize their feet regularly are not aware of the right method to do so and a huge proportion never moisturized.

The kind of footwear used by people is in accordance to their occupation, affordability, lifestyle and comfort. A small proportion of people use the advised footwear.

The data collected includes 25 years old and also 85, this shows that diabetes can affect any age group. The younger group, the recent diabetics are more aware than the middle and old aged. Old age brings with it its own set of challenges like inability to perform self-care, absentmindedness, forgetfulness, etc. which justifies their poor scores.

Urban and rural participants do not have much difference in their scores. The slightly higher scores among the urbanites are probably due to better access to facilities.

Cultural practices play an important role in the practice of foot care. As mentioned earlier, many people wash their feet multiple times in a day without knowing its importance where as a very small number of people use footwear at home. A number of people are aware of the importance of footwear at home but they don't follow it as it's against their culture.

The problems of old age can probably be overcome by increasing the involvement of family and maybe the house help, by educating them along with the patient.

According to preventive and social medicine by Park, proper foot care in people with risk of ulcers can reduce the incidence of DFU by 50-60%. Various studies like Vatankhah et al in Tehran, Iran; Saurabh et al in Puducherry, India show that there is an improvement in knowledge and practice scores after one educational session. Patient education will have positive but short-lived effects.^{11,13} Hence, it is necessary to have repeated counselling. A prospective study by Dargis, Pantelejeva, Jonushaite, Vileikyte and Boulton, has demonstrated the effectiveness of re-education every 3 months.¹⁴

An integrated care or multidisciplinary approach to diabetic foot problems could help reduce the incidence of DFUs. This team could include physicians, nurses, podiatrists and maybe a counsellor.

Screening of diabetics for foot complications among the high-risk patients could also reduce the incidence, particularly screening for those whose occupation poses a risk of ulcers like farmers.

These kinds of facilities mentioned above must be made available in rural areas through PHCs. According to K. Park, inadequacies in primary health systems which are not designed to cope with the additional challenges or complications that come along with chronic non communicable diseases like diabetes, leads to poor detection of cases, suboptimal treatment and insufficient follow ups resulting in disabilities and severe complications.¹⁵ PHCS could be made use of, more extensively, as a platform to emphasise the importance of self-performed foot care.

Support groups or group counselling could also be held so that patients who have history of ulcers can talk about their journey through the treatment and the complications faced to raise awareness on foot care. This study showed that the people with a history of ulcers have more knowledge and practice scores than others. Such information coming from someone who that group of people have seen suffer could have a better impact.

There are limitations to this study which we have recognized. A few questions like the use of stockings, heat pads and radiators, are not suitable for our local setting in contrast to where the Nottingham foot care questionnaire was developed. Also, certain details like

smoking history, medications and HbA1c were not filled by a number of patients and hence these factors have been excluded in this study.

CONCLUSION

Patient education is important but re-education is the key to improve the knowledge and practice of diabetic foot care. An integrated care approach, involvement of family in old age, group counselling including repeated demonstration of the right foot care methods would help perk up foot care and reduce or postpone incidence of diabetic foot ulcer.

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REFERENCES

1. Ghosh P, Valia R. Burden of Diabetic Foot Ulcers in India: Evidence Landscape from Published Literature. *Value in Health*. 2017;20(9):485.
2. Kumpatla S, Kothandan H, Tharkar S, Viswanathan V. The Costs of Treating Long Term Diabetic Complications in a Developing Country: A Study from India. *JAPI*. 2013;61(2):102-9.
3. Shah VN, Kamdar PK, Shah N. Assessing the knowledge, attitudes and practice of type 2 diabetes among patients of Saurashtra region, Gujarat. *Int J Diabetes Dev Ctries*. 2009;29(3):118-22.
4. Magbanua E, Alba RL. Knowledge and Practice of Diabetic Foot Care in Patients with Diabetes at Chinese General Hospital and Medical Center. *J ASEAN Federation Endocrine Societies*. 2017;32(2):123.
5. Sutariya PK, Kharadi A. Knowledge and practice of foot care among the patients of diabetic foot: a hospital based cross-sectional study. *Int Surg J*. 2016;3(4):1850-55.
6. Senussi M, Lincoln N, Jeffcoate W. Psychometric properties of the Nottingham Assessment of Functional Foot care (NAFF). *Int J Therapy Rehabilitation*. 2011;18(6):330-4.
7. Chellan G, Srikumar S, Varma AK, Mangalanandan TS, Sundaram KR, Jayakumar RV, et al. Foot care practice-the key to prevent diabetic foot ulcers in India. *Foot (Edinb)*. 2012;22:298-302.
8. Vatankhah N, Khamseh ME, Noudeh YJ, Aghili R, Baradaran HR, Haeri NS. The effectiveness of foot care education on people with type 2 diabetes in Tehran, Iran. *Primary Care Diabetes*. 2009;3(2):73-7.

9. Alexiadou K, Doupis J. Management of diabetic foot ulcers. *Diabetes Ther.* 2012;3(4):1-15.
10. Boulton AJM, Vileikyte L, Ragnarson TG, Apelqvist J. The global burden of diabetic foot disease. *Lancet.* 2005;366(9498):1719-24.
11. Hasnain S, Sheikh NH. Knowledge and practices regarding foot care in diabetic patients visiting diabetic clinic in Jinnah Hospital, Lahore. *J Pak Med Assoc.* 2009;59(10):687-90.
12. Lincoln NB, Jeffcoate WJ, Ince P, Smith M, Radford KA. Validation of a new measure of protective footcare behaviour: The Nottingham Assessment of Functional Footcare (NAFF). *Pract Diab Int.* 2007;2(4):207-11.
13. Saurabh S, Sarkar S, Selvaraj K, Kar SS, Kumar SG, Roy G. Effectiveness of foot care education among people with type 2 diabetes in rural Puducherry, India. *Indian J Endocrinal Metab.* 2014;18(1):106-10.
14. Dargis V, Pantelejeva O, Jonushaite A, Vileikyte L, Boulton AJ. Benefits of a multidisciplinary approach in the management of recurrent diabetic foot ulceration in Lithuania: a prospective study. *Diabetes Care.* 1999;22(9):1428-31.
15. Park K. Health care of the community. In: Park's textbook of preventive and social medicine. 25th ed. Jabalpur: Bhanot; 2019: 950-980.

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