

Research Article

DOI: <http://dx.doi.org/10.18203/2394-6040.ijcmph20162559>

Effectiveness of self-learning module on the knowledge and practices regarding foot care among type II diabetes patients in East Delhi, India

Reeta Devi^{1*}, Bimla Kapoor¹, Mongjam Meghachandra Singh²

¹School of Health Sciences, Indira Gandhi National Open University, Maidan Garhi, New Delhi, India

²Department of Community Medicine, Maulana Azad Medical College, New Delhi, India

Received: 07 June 2016

Accepted: 01 July 2016

*Correspondence:

Dr. Reeta Devi,

E-mail: devireeta@gmail.com

Copyright: © the author(s), publisher and licensee Medip Academy. This is an open-access article distributed under the terms of the Creative Commons Attribution Non-Commercial License, which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

ABSTRACT

Background: Promoting self-care practices forms the cornerstone of care among patients of type II diabetes specially foot care which is widely neglected by the patients. The present study explored the effectiveness of a self-learning module (SLM) on the knowledge and practices regarding foot care among type II diabetic patients (T2DM).

Methods: An earlier house to house survey identified 340 type II diabetic patients in a residential area of East Delhi. The patients were divided into four groups consecutively each having 85 T2DM patients. The groups were randomized into intervention group with SLM and another as control. Pre and post-test evaluation (after three months) was done using pre-tested interview schedule on knowledge and practices regarding foot care. Chi-square, Mc Nemar's test, 't' test (paired and unpaired) were used for pre-post comparison of knowledge and practices. 'p' less than 0.05 was considered significant.

Results: The age of the study subjects ranged from 20 to 80 years with similarity between intervention (SLM) and control groups in terms of distribution of various socio-economic and demographic variables ($p>0.05$). SLM was significantly effective than control group in increasing knowledge on aspects of effect of diabetes on foot ($p<0.05$), foot care and its steps ($p<0.05$). The mean pre-test score on foot care procedure were 9.55 ± 3.33 in SLM and 9.04 ± 3.55 in control groups. The mean score increased to 36.9 ± 4.35 in SLM ($p<0.001$) and 9.37 ± 3.84 ($p=0.48$) in control groups in post-test.

Conclusions: SLM was effective in increasing knowledge and practices regarding foot care among type II diabetic patients in East Delhi.

Keywords: Knowledge, Practices, Foot care, Diabetes

INTRODUCTION

Diabetes is a chronic metabolic disorder associated with complications resulting from long term damage, dysfunction, and failure of various body organs, especially the eyes, kidneys, nerves, heart and blood vessels.¹ One of the distressing effects resulting from micro vascular complication such as neuropathy is diabetic foot. As per a report, neuropathy affects 20-50% diabetic patients.² Asia is considered to be the epicentre

of the epidemic of diabetes.³ World's most populous countries such as China with 20% of the world's population and India with more than one billion have the greatest numbers of people with diabetes, and are likely to remain in this position in 2025, with an expected 20 million affected individuals.⁴ A nationwide urban study covering six cities of India using oral glucose tolerance test (OGTT) and self-report criteria reported 12.1% prevalence of diabetes.⁵ The prevalence of diabetes in Delhi showed an increasing trend over the years from

3.1% (Verma NPS et al) to 10.3% (Misra A et al), and 15.0% (Prabhakaran D et al) in the population aged 18/20 years and above.⁶⁻⁸

Understanding knowledge and practice among the diabetic patients is important in planning for behaviour change communication for better control of diabetes and its complications. Few studies have reported knowledge and practices regarding diabetic foot and its care in India. A study by Ahmad A et al among 124 diabetic patients in north India observed that 60.5% and 79.0% had poor score of knowledge and practice of diabetes respectively.⁹ Jackson IL et al reported that 79.5% diabetic patients in two states of Nigeria had 70% or more overall knowledge level about self-care.¹⁰

A study from UAE by Al-Maskari F et al among 575 diabetic patients observed low levels of awareness about diabetes.¹¹ Kheir et al observed poor practices of regularly inspecting feet to detect neuropathy among 80 type II diabetes mellitus (T2DM) patients in a tertiary care hospital in Qatar.¹² Study by Majra P et al in Dakshina Kannada district of Karnataka state reported that 15% diabetic subjects knew about chronic complications of diabetes, 17% about diabetic foot and low practices related to care.¹³ Jain et al from Pune reported that 62.5% patients had poor knowledge score on foot care.¹⁴ A cross-sectional study among diabetic patients in Nigeria by Desalu et al found that only 10.2% had good practices regarding foot care.¹⁵

Prevention of complications in diabetes requires appropriate medical care with significant alterations in lifestyle and self-care practices. Patient education has been proven to be an important aspect of management of diabetes (ADA).¹⁶ Diabetic foot can be prevented if the patient is educated about care of foot and blood glucose level is kept under control.

One of the approaches for creating self-awareness and skill development on foot care in diabetes is through self-learning module (SLM). There is scant information on studies in India conducted in the community setting which have reported the effect of self-learning module on the knowledge and practices regarding diabetic foot and its care among diabetic patients. The present study aims at finding out the effectiveness of a self-learning module on the knowledge and practices regarding foot care among T2DM patients in the community setting.

METHODS

This was an interventional study in the community setting. A prior house to house survey identified 340 type II diabetic patients in a residential area of East Delhi based on the available medical records. The patients were enumerated and divided into four groups consecutively each having 85 T2DM patients. The groups were randomized by lottery method into intervention group with SLM and another as control.

The sample size was calculated based on the following assumption in absence of similar studies in India. Considering 50% knowledge and practices on foot care, and assuming 22% difference in the increase in knowledge and practice on foot care between intervention group with a self-learning module (SLM) and control group after 6 months of follow up, at 80% power and 5% alpha error with 10% attrition, a sample size of 85 T2DM patients in either group was considered to be adequate. Baseline information (pre-test) on knowledge and practices regarding foot care was collected in both intervention and control groups in the households by interviewing the T2DM subjects using a pre-tested semi-structured interview schedule after taking written informed consent.

A self-learning module covering aspects of signs of symptoms, risk factors, complications, self-care including foot care in diabetes was prepared in English and Hindi. The content was validated by 21 experts in internal medicine (5), community medicine (8), nursing (7) and one dietitian. The content in English was translated by a language expert into Hindi and another language expert re-translated the Hindi version back to English and corrections were done accordingly and finalized. The SLM was trial tested for its feasibility, acceptability among 5 T2DM patients (2 in English and 3 in Hindi) in a residential block other than the study area and these were found to be feasible and acceptable.

SLM was distributed in English or Hindi as per the choice of the study subjects in SLM group and the content of the SLM was discussed for one and half hours with the study participant individually. In addition, both the intervention and control groups received routine care from their physicians as usual. Post-test evaluation was done after three months with the same pre-tested interview schedule used in pre-test.

Practice on steps of foot care procedure was evaluated with scores (two score for each correct step with maximum score of 40 for twenty steps). The study was approved by the Doctoral Committee of School of Health Sciences, research unit of Indira Gandhi National Open University, New Delhi. Chi-square, Fisher's exact test, Mc Nemar's test, paired and unpaired 't' test were used for comparison of knowledge and practices between comparable groups. 'p' less than 0.05 was considered as significant.

RESULTS

Socio-economic and demographic characteristics of the study subjects are shown in Table 1.

The age of the study subjects ranged from 20 to 80 years. The age of the study subjects were similar across the study groups ($p=0.18$). 51.8% were males in SLM group and 56.5% in the control group. Gender wise distribution of the subjects was also similar across the study groups

(p=0.53). The literacy status among the study subjects showed that 2.4% in SLM and 3.5% in control groups could read and write only, whereas 70.6% in SLM and 67.1% in control group were graduate and above.

The occupation of the study subjects were similar across the study groups (p=0.71). 48.2% study subjects in SLM and 43.5% in control group were living in nuclear family

(p=0.53). Maximum number of the study subjects (82.4% in SLM and 74.1% in control group) had family size of 1-5 (p=0.19).

Religion wise, maximum number of study subjects (88.2% in SLM and 89.4% in control group) were Hindus and the distribution of study subjects according to religion across the groups was similar (p=0.47).

Table 1: Socio-economic and demographic characteristics of the study subjects.

Variables	SLM No (%) n=85	Control No (%) n=85	X ² , df, 'p' value
Age groups (years)			
20-29	0 (0.0)	2(2.4)	7.55, 5, 0.18
30-39	5 (5.9)	4(4.7)	
40-49	12 (14.1)	14(16.5)	
50-59	32 (14.1)	29(34.1)	
60-69	32 (37.6)	24(28.2)	
70-80	4 (4.7)	12(14.1)	
Gender			
Male	44 (51.8)	48(56.5)	0.37, 1, 0.53
Female	41(48.2)	37(43.5)	
Literacy status			
Read and write	2 (2.4)	3(3.5)	6.45, 4, 0.16
Primary	6 (7.1)	6(7.1)	
Secondary	14 (16.5)	8(9.4)	
Senior secondary	3 (3.5)	11(12.9)	
Graduate and above	60 (70.6)	57(67.1)	
Occupation			
Government job	14 (16.5)	9 (10.6)	2.1, 4, 0.71
Private job	15 (17.6)	21(24.7)	
Business	7 (8.2)	7 (8.2)	
Household work	34 (40.0)	33 (38.8)	
Retired	15 (17.6)	15 (17.6)	
Family type			
Nuclear	41 (48.2)	37 (43.5)	0.38, 1, 0.53
Joint	44 (51.8)	48 (56.5)	
Family size			
1-5	70 (82.4)	63 (74.1)	1.69, 1, 0.19
6-10	15 (17.6)	22 (25.9)	
Religion			
Hindu	75 (88.2)	76 (89.4)	3.50, 4, 0.47
Muslim	1 (1.2)	1 (1.2)	
Sikh	5 (5.9)	1 (1.2)	
Christian	2 (2.4)	3 (3.5)	
Jain	2 (2.4)	4 (4.7)	
Per capita family income per month (Rs.)			
Up to 10000	20 (23.5)	16 (18.8)	6.55, 3, 0.08
10001-20000	49 (57.6)	43 (50.6)	
20001-30000	15 (17.6)	18 (21.2)	
30001 and above	1 (1.2)	8 (9.4)	

Table 2: Comparison of knowledge regarding effect of diabetes on foot among the study groups in pre and post-test.

Effect of diabetes on foot	Groups		X ² , df, 'p' value
	SLM* No (%) n=85	Control No (%) n=85	
Less or no sensation of pain			
Pre	2(2.4)	7(8.2)	0.43,1,0.51
Post	82(96.5)##	11(12.9)	119.7,1,<0.001
Less or no sensation to hot and cold temperature			
Pre	2(2.4)	5(5.9)	0.71 **
Post	81(95.3)##	11(12.9)	116.1,1,<0.001
Tingling or numbness sensation			
Pre	24(28.2)	20(23.5)	0.49,1,0.48
Post	53(62.4)##	23(27.1)	21.4,1,<0.001
Feeling burning sensation			
Pre	5(5.9)	8(9.4)	0.75,1,0.38
Post	50(58.8)##	13(15.3)	34.5,1,<0.001
Sharp pain sensation or cramps			
Pre	8(9.4)	10(11.8)	0.25,1,0.61
Post	58(68.2)##	12(14.1)	111.3,1,<0.001

*SLM- Self learning module, ** By Fisher's exact test, #Significant between pre and post-test by McNemar's test (p<0.05).

Table 3: Comparison of knowledge on foot care in diabetes among the study groups in pre and post-test.

Aspects of foot care in diabetes	SLM*No (%) n=85	Control No (%) n=85	X ² , df, 'p' value
Check foot condition daily			
Pre	9 (10.6)	7 (8.2)	0.27,1,0.59
Post	46 (54.1)##	8 (9.4)	30.25,1,<0.001
Apply lotion on feet			
Pre	72 (84.7)	71 (83.5)	0.04,1,0.83
Post	85 (100)##	75 (88.2)	10.62,1, 0.001
Wearing of socks			
Pre	41 (48.2)	35 (41.2)	0.85,1,0.35
Post	80 (94.1)##	39 (45.9)	47.08,1,<0.001
Not walking barefoot			
Pre	9 (10.6)	13 (15.3)	0.83,1,0.36
Post	75 (88.2)##	19 (22.4)	74.6,1,<0.001
Avoid heating pads to relieve pain in feet			
Pre	6 (7.1)	3 (3.5)	1.05,1,0.30
Post	21 (24.7)##	4 (4.7)	15.7,1,<0.001
Checking shoes before wearing			
Pre	5 (5.9)	6 (7.1)	0.09,1,0.75
Post	68 (80.0)##	11 (12.9)	76.8,1,<0.001
Report any abnormal changes to doctor			
Pre	2(2.4)	3(3.5)	0.26,1,0.65
Post	51(60.0)##	6(7.1)	53.4,1,<0.001
Avoid removing corn by self			
Pre	7 (8.2)	4 (4.7)	0.87,1,0.35
Post	30 (35.3)##	9 (10.6)	14.6,1,<0.001

*SLM- Self learning module, #Between pre and post-test by Mc Nemar's test (p<0.05).

The per capita family income per month was also similar in both the study groups (p=0.08). Maximum number (57.6% in SLM and 50.6% in control group) was having

per capita family income of rupees 10001 to 20000 per month. During pre-test, study subjects perceived awareness regarding diabetes affecting feet was 74.1% in

SLM and 61.2% in the control group ($P=0.07$). During post-test, it increased to 100% in SLM ($p<0.001$) and 63.5% in control group ($p=0.75$) indicating that SLM was effective in increasing the awareness regarding diabetes affecting feet. The study groups showed similarity in terms of literacy status ($p=0.16$). Only 16.5% in SLM and 10.6% in control group were doing government job, 40.0% in SLM and 38.8% in control group were doing household work and 17.6% in either group were retired.

Table 2 shows knowledge regarding the effects of diabetes on feet among the study subjects. During pre-test, few had knowledge about less or no sensation of pain (2.4% in SLM vs. 8.2% in control group, $p=0.51$), less or no sensation of hot or cold temperature (2.4% in SLM vs. 5.9% in control group, $p=0.71$), feeling of burning sensation (5.9% in SLM vs 9.4% in control group), and sharp pain sensation or cramps (9.4% in SLM vs 11.8% in control group, $p=0.61$).

Knowledge on these aspects of diabetes on feet were similar in the study groups ($p>0.05$). The SLM was effective in increasing the knowledge during post-test on all aspects of diabetes affecting foot ($p<0.05$) and not in the control groups.

The difference between SLM and control groups during post-test, on these knowledge aspects of effects of diabetes on foot were statistically significant ($p<0.001$).

Table 3 shows knowledge on various aspects of foot care among the study groups. During pre-test, few (10.6% in SLM vs. 8.2% in control groups) knew that foot should be checked daily and the difference was not significant ($p=0.59$). Similarly, only few had knowledge about not walking barefoot (10.6% in SLM vs. 15.3% in control group, $p=0.36$), avoid heating pads to relieve pain in feet (7.1% in SLM vs. 3.5% in control group, $p=0.30$), checking shoes before wearing (5.9% in SLM vs. 7.1% in control group, $p=0.75$), avoid removing corn by self (8.2% in SLM vs. 4.7% in control group, $p=0.35$).

A large number of subjects knew about applying lotion on feet (84.7% in SLM vs. 83.5% in control group, $p=0.83$). After intervention in post-test, knowledge improved significantly in the SLM ($p<0.05$), but not in the control group on all the aspects of foot care. The knowledge on aspects of foot care in diabetes was significantly higher during post-test in SLM as compared to control group ($p<0.001$).

Table 4: Changes in foot care procedure between pre and post-test among study subjects (n=138).

Steps of foot care procedure	SLM (n=71)		'p' value	Control (n=67)		'p' value
	Pre No (%)	Post No (%)		Pre No (%)	Post No (%)	
Wash hands	6 (8.5)	69 (97.2)	<0.001	5 (7.5)	10 (14.9)	0.17
Arrange luke warm water	14 (19.7)	71 (100)	<0.001	13 (19.4)	17 (25.4)	0.40
Arrange nail cutter, mirror	8 (11.3)	57 (80.3)	<0.001	7 (10.4)	10 (14.9)	0.43
Arrange lotion	10 (14.1)	69 (97.2)	<0.001	9 (13.4)	13 (19.4)	0.35
Arrange dust bin	8 (11.3)	56 (78.9)	<0.001	8 (11.9)	11 (16.4)	0.45
Sit comfortably	9 (12.7)	71 (100)	<0.001	4 (6.0)	12 (17.9)	0.03
Check water temperature	4 (5.6)	66 (93.0)	<0.001	2 (3.0)	4 (6.0)	0.68
Dip feet in water 10-15 mins.	4 (5.6)	71 (100)	<0.001	3 (4.5)	9 (13.4)	0.06
Take out feet	4 (5.6)	71 (100)	<0.001	3 (4.5)	9 (13.4)	0.06
Dry between toe	1 (1.4)	66 (93.0)	<0.001	4 (6.0)	8 (11.9)	0.22
Cut nails straight	8 (11.3)	57 (80.3)	<0.001	8 (11.9)	9 (13.4)	0.79
Apply lotion	10 (14.1)	61 (85.9)	<0.001	9 (13.4)	15 (22.4)	0.17
Avoid lotion between toe	1 (1.4)	59 (83.1)	<0.001	1 (1.5)	1 (1.5)	1.00
Inspect sole with mirror	0(0.0)	65(91.5)	<0.001	0(0.0)	0(0.0)	
Examine foot	5(7.0)	71(100)	<0.001	8(11.9)	10(14.9)	0.61
Wear shoes	24(33.8)	68(95.8)	<0.001	20(29.9)	26(38.8)	0.27
Put waste in bin	8(11.3)	56(78.9)	<0.001	4(6.0)	8(11.9)	

Between study groups: in pre-test, all steps, $p>0.05$; in post-test, all steps $p<0.001$.

Tables 4 shows changes in practices regarding steps in the foot care procedures between pre and post-test (after intervention) among the study groups. Only 138 (SLM-71, control-67) subjects showed the foot care procedures in both pre and post-test and they were included for the analysis.

During pre-test, there were no significant differences between the study groups regarding the steps in foot care procedures ($p>0.05$). During post-test, there was significant increase in performing the steps of foot care procedure in SLM group ($p<0.001$) and significantly higher than the control groups in each of the steps ($p<0.05$). But it was not seen in control groups ($p>0.05$). During pre-test, none of the subjects inspected sole with mirror. After intervention, there was significant improvement in SLM group regarding inspection of sole with mirror but not in the control group.

During pre-test, the mean score between SLM (9.55 ± 3.33) and control (9.04 ± 3.55) were not statistically different ($p>0.05$). The mean score improved significantly in post-test in SLM (36.90 ± 4.35) ($p<0.001$) and not in the control group ($p=0.48$). The mean score in post-test in SLM group was also significantly higher than control group ($p<0.001$).

Table 5: Scores on foot care procedures among the study groups in pre and post-test (n=138).

Foot care scores	SLM No (%) n=71	Control No (%) n=67
2-20 Pre	71 (100)	67 (100)
Post	0 (0.0)	66 (98.5)
21-40 Pre	0 (0.0)	0 (0.0)
Post	71 (100)	1 (1.5)
Pre (Mean \pm SD)	9.55 ± 3.33	9.04 ± 3.55
Range	6 to 18	6 to 18
Post (Mean \pm SD)	36.90 ± 4.35	9.37 ± 3.84
Range	28 to 40	6 to 22
't' paired value, df,	45.17, 70,	0.70, 66,
'p' value	<0.001	0.48

DISCUSSION

The present study showed that during pre-test, few in both SLM and control groups knew about effect of diabetes on foot ranging from 2.4% for less or no pain sensation/ no sensation to hot and cold temperature in SLM group to 28.2% for tingling or numbness sensation in SLM group. This is slightly higher than 0.5% diabetic patients who had awareness about diabetic foot and peripheral neurological problems in Khulna Diabetic Centre, Bangladesh (Hoque et al).¹⁷

The differences in knowledge regarding foot care among the diabetes patients across the studies could be due to the different levels of diabetes care education provided by the

health care professionals in different settings and also on the literacy level of the study subjects.

The knowledge improved significantly in the intervention group on all aspects of the effects of diabetes on foot as compared to control group at the end of six months indicating the effectiveness of SLM in the present study.

Knowledge on foot care

In the present study, during pre-test, only 10.6% in SLM and 8.2% in control group knew about checking feet daily, applying lotion (84.7% in SLM vs 83.5% in control group), wearing socks (48.2% in SLM vs 41.2% in control group), not walking barefoot (10.6% in SLM vs 15.3% in control group), checking shoes before wearing (5.9% in SLM vs 7.1% in control group), and avoid removing corn by self (8.2% in SLM vs 4.7% in control group). The differences were not significant between SLM and control groups in each aspect of the foot care procedure ($p>0.05$).

The observation is consistent with the findings of Upadhyay et al from Nepal who reported that only 16.6% were aware about comprehensive knowledge on foot care.¹⁸ Jain from Pune observed that 62.5% diabetic patients had poor score regarding foot care.¹⁴ Khapre et al reported that less than 25% knew about importance of foot care in Wardha, Maharashtra. Kaur K et al from slum area of Chandigarh observed that foot care was done by 63.3% through regular washing.^{19,20}

Hamidah et al conducted a study among newly diagnosed diabetic patients in an outpatient clinic of a hospital in Kuala Lumpur, Malaysia and their findings showed that only 18.3% had high score on knowledge regarding foot care. Desalu et al from Nigeria observed that 78.4% diabetic patients had poor knowledge on foot care (score less than 50%), and 61.4% were unaware of the importance of inspecting inside of footware for foreign object.^{15,21} Only 30.1% had good knowledge of foot care (score $\geq 70\%$).

During post-test, there were significant improvements in the knowledge on various aspects of foot care in the SLM group as compared to control group showing that SLM was effective in increasing knowledge on these aspects of foot care.

Foot care practices

In the present study, only 138 out of 170 (81.2%) carried out foot care procedures during both pre and post-test. However, only few followed various steps of foot care correctly. During pre-test, only 1.4% in SLM and 6.0% in control groups dried between toes, 14.1% in SLM and 13.4% in control groups applied lotion to feet, 11.3% in SLM and 11.9% in control groups trimmed nails straight, 7.0% in SLM and 11.9% in control groups examined foot, and 33.8% in SLM and 29.9% in control groups

wore footwear. In contrast, Shrivastava PS et al observed that in Tamilnadu 82.5% subjects wore footware regularly and 17.5% took extra care of their feet. Rajsekharan et al reported that 64.8% washed their feet daily, and among them only 70.7% dried between their toes after washing.^{22,23} Only 28.3% checked their feet on all days of the week, 13.4% examined the inner surface of their shoes.

During pre-test, the overall mean foot care score was 9.55 ± 3.33 in SLM and 9.04 ± 3.55 in control group out of maximum score of 40 indicating limited foot care practices among the study subjects.

Several studies reported poor foot care practices among the diabetes patients. Kheir et al reported that there were poor practices regarding inspection of foot regularly among the T2DM patients in Qatar.¹² Hamidah et al from Malaysia observed that 28.4% newly diagnosed diabetic patients had practiced good habits towards care of feet.²¹ Desalu et al from Nigeria observed that only 10.2% diabetic patients had good foot care practices.¹⁵

Mehta P et al from Gujarat reported that 28.0% did regular foot checking. Raithatha et al from Anand, Gujarat reported that only 9% examined feet on a routine basis, 12% examined the footware for any thorns or foreign body and 4% were wearing footware inside their houses.^{24,25}

Saeed N from Islamabad, Pakistan reported that 6% subjects were doing their proper foot care.²⁶ Other findings on foot care procedures were: daily foot inspection (17.0%), daily washing of feet (73.0%), drying feet (23.0%), applying lotion to feet (27.0%), checking shoes before wearing (25.0%), wearing of cotton socks (8.0%), walking bare foot (36.0%), trimming of nails (19.0%), and self-treatment of corns or callosities (21.0%).

Anselmo MI et al observed that 8.7% subjects wore footware regularly, 65% inspected foot by self, 77% applied cream, 88% did proper washing and drying, 83% cut toe nails properly, 77% inspected shoes routinely, 70% did not use pumice and 95% did not walk barefoot.²⁷

The variations in the foot care practices across the studies could be due to the differences in the awareness and motivation of the study subjects across the studies. The practice of foot care component is essential for the prevention of foot ulcers and subsequent development of gangrenous lesions that can lead to limb amputations which result in increased disability and handicap. Hence, it is essential to create awareness in this regard among the diabetic patients.²⁸

In the present study, the scores on foot care procedures increased significantly in post-test in SLM (36.9 ± 4.35) as compared to control (9.37 ± 3.84) ($p < 0.001$) showing that SLM was effective in increasing the foot care practices.

There is paucity of information on the studies comparing effectiveness of self-learning module and control on foot care practices of diabetes patients. Baba et al have compared the effectiveness using written educative material with interactive educator led session after three months of intervention.²⁹ They reported that written material was more effective in improving functional foot care score by 1.8 from baseline in 3 months than interactive session (change of 0.1 score) than interactive educator led session.

Few researchers conducted studies to find out the effectiveness of self-instructional module (SIM) on knowledge, skills of diabetic patients (Zagade et al; Thomas et al.; Hartayu et al.³⁰⁻³² Study by Zagade et al had quasi experimental design with one group pre and post-test and study subjects were selected by non-probability purposive sampling method. SIM was observed to be effective in increasing knowledge on prevention of micro and macrovascular complications, while Thomas et al, showed increasing knowledge scores from 16.02 ± 4.3 in pre-test to 20.97 ± 1.8 in post-test, and Hartayu et al showed improvement in knowledge, attitude and practices.^{30-31,32}

Counselling and distribution of leaflets during bedside meetings with diabetes patients and during regular visits in follow up after discharge from hospital for two months was effective in improving knowledge significantly without changes in attitude and practices (Palaian S et al).³³

The present study showed that SLM was effective in increasing knowledge and practices on foot care among the T2DM patients in the study area at the end of three months from intervention. In absence of an active teaching learning session on foot care among the diabetic patients SLM can be utilised to educate the patients.

CONCLUSION

SLM was effective in increasing knowledge and practices regarding foot care among type II diabetic patients in East Delhi.

Funding: No funding sources

Conflict of interest: None declared

Ethical approval: Doctoral Committee, School of Health Sciences, Indira Gandhi National Open University, Maidan Garhi, New Delhi

REFERENCES

1. American Diabetes Association. Standards of Medical Care in Diabetes-2008. *Diabetes Care.* 2008;31:s12-54.
2. Bouiton AJ, Malik RA. Diabetic Neuropathy. *Med Clin North Am.* 1998;82:909-29.
3. Sicree R, Shaw JE, Zimmet PZ. The global burden of diabetes. In: Gan D, ed. *Diabetes Atlas*, 2nd ed.

Brussels: International Diabetes Federation, 2003: 15-71.

- 4. Roglic G, King H. Diabetes mellitus in Asia. *Hong Kong Med J.* 2000;6:10-1.
- 5. Ramachandran A, Snehalatha C, Kapur A, Vijay V, Mohan V, Das AK, et al. High prevalence of diabetes and impaired glucose tolerance in India: National Urban Diabetes Survey. *Diabetologia.* 2001;44:1094-101.
- 6. Varma NPS, Mehta SP, Madhu SV, Mather HM, Keen H. Prevalence of known diabetes mellitus in an urban Indian environment: the Darya Ganji diabetes survey. *Br Med J.* 1986;293:423.
- 7. Misra A, Pandey RM, Devi JR, Sharma R, Vikram NK, Khanna N. High prevalence of diabetes, obesity and dyslipidaemia in urban slum population in northern India. *Int J Obes.* 2001;25:1722-9.
- 8. Prabhakaran D, Shah P, Chaturvedi V, Ramakrishnan L, Manhapra A, Reddy KS. Cardiovascular risk factor prevalence among men in a large industry of northern India. *Natl Med J India.* 2005;18:59-65.
- 9. Ahmad A, Ahmad MT. Assessment of knowledge, attitude and practice among diabetic patients attending a health care facility in North India. *Indian Journal of Basic and Applied Medical Research.* 2015;4(3):501-509.
- 10. Jackson IL, Adibe MO, Okonta MJ, Ukwue CV. Knowledge of self-care among type 2 diabetes patients in two states of Nigeria. *Pharm Pract (Granada).* 2014;12(3):404.
- 11. Al-Maskari F, El-Sadig M, Al-Kaabi JM, Afandi B, Nagelkerke N, Yeatts KB. Knowledge, attitude and practices of diabetic patients in the United Arab Emirates. *PLoS One.* 2013;8(1):e52857.
- 12. Kheir N, Greer W, Yousif A, Al G H, Al OR. Knowledge, attitude and practices of Qatari patients with type 2 diabetes mellitus. *Int J Phar Pract.* 2011;19(3):185-91.
- 13. Majra P, Acharya D. Awareness regarding self care among diabetics in rural India. *Middle East Journal of Family Medicine.* 2009;7(6):11-4.
- 14. Jain PK. Knowledge and attitude of diabetic patients regarding diabetic diet, exercise and foot care. *International Journal of Nursing Education.* 2012;4:141-5.
- 15. Desalu OO, Salawu FK, Jimoh AK, Adekoya AO, Busari OA, Olokoba AB. Diabetic foot care: self reported knowledge and practice among patients attending three tertiary care hospitals in Nigeria. *Ghana Med J.* 2011;45:60-5.
- 16. American Diabetes Association. National standards for diabetes self-management education and support. *Diabetes Care.* 2014;37:S144-S153.
- 17. Hoque MA, Islam MDS, Khan MDAM, Ahsan H. Knowledge of diabetic complications in a diabetic population. *J Medicine.* 2009;10:90-3.
- 18. Upadhyay DK, Mohamed MI, Alurkar VM, Mishra P, Palaian S. Evaluation of knowledge, attitude and practice of newly diagnosed diabetes patients- a base line study from Nepal. *International Journal of Pharmacy Teaching and Practices.* 2012;3:245-52.
- 19. Khapre MP, Mudey A, Goyal RC, Wagh V. Low Awareness of Diabetes Affecting the Clinical Outcome of Patients A Cross-Sectional Study Conducted in Rural Tertiary Care Hospital. *Int J Bio Med Res.* 2011;2:627 -30.
- 20. Kaur K, Singh MM, Kumar, Walia I. Knowledge and self-care practices of diabetics in a resettlement colony of Chandigarh. *Indian J Med Sci.* 1998;52:341-7.
- 21. Hamidah H, Santhna LP, Ruth PRD, Suraya AM, Yap WC, Samsiah M, et al. Foot care strategy for the newly diagnosed DM Type 2 patients with low educational and socio-economic background: a step towards future. *Clin Ter.* 2012;163(6):473-8.
- 22. Shrivastava PS, Shrivastava SR, Ramasamy J. An Epidemiological Study to Assess the Knowledge and Self Care Practices among Type 2 Diabetes Mellitus Patients Residing in Rural Areas of Tamil Nadu. *Biol Med.* 2015;S3:002.
- 23. Rajasekharan D, Kulkarni V, Unnikrishnan B, Kumar N, Holla R, Thapar R. Self-care activities among patients with diabetes attending a tertiary care hospital in Mangalore Karnataka, India. *Ann Med Health Sci Res.* 2015;5(1):59-64.
- 24. Mehta P, Godbole V, Gosai F, Brahmbhatt K. Knowledge of diabetes and self-care practices in chronic diabetic patients attending a tertiary care teaching hospital in India. *NJIRM.* 2014;5(2):91-7.
- 25. Raithatha SJ, Shankar SU, Dinesh K. Self-Care Practices among Diabetic Patients in Anand District of Gujarat. *ISRN Family Med.* 2014, Article ID743791:pp6.2014.
- 26. Saeed N. Frequency of patients with diabetes taking proper foot care according to international guidelines and its impact on their foot health. *J Pak Med Assoc.* 2010;60:732-35.
- 27. Anselmo MI, Nery M, Parisi MCR. The effectiveness of educational practice in diabetic foot: a view from Brazil. *Diabetology and Metabolic Syndrome.* 2010;2:45.
- 28. Saeed N, Zafar J, Atta A. Frequency of patients with diabetes taking foot care according to international guidelines and its impact on their foot health. *J Pak Med Assoc.* 2020;60:732-5.
- 29. Baba M, Duff J, Foley L, Davies WA, Davies TME. A comparison of two methods of foot health education: The Fremantle Diabetes Study Phase II. *Primary Care Diabetes.* 2015;9(2):155-62.
- 30. Zagade T, Patil A. Effectiveness of Self Instructional Module on Knowledge Regarding Prevention of Microvascular and Macrovascular Complications among Patients with Diabetes Mellitus. *International Journal of Science and Research.* 2014;3(5):902-8.
- 31. Thomas S, Mohite VR. Effectiveness of self instructional module on the knowledge regarding diabetic diet among diabetic patients. *International Journal of Science and Research.* 2014;3(6):672-8.

32. Hartayu TS, Izham M, Suryawati S, Improving of Type 2 Diabetic Patients' Knowledge, Attitude and Practice Towards Diabetes Self-care by Implementing Community-Based Interactive Approach-Diabetes Mellitus Strategy. *BMC Research Notes.* 2012;5:315-20.
33. Palaian S, Acharya LD, Rao PGM, Shankar PR, Nair NM, Nair NP. Knowledge, attitude, and practice outcomes: evaluating the impact of counselling in hospitalized diabetic patients in India. *P and T Journal.* 2006;31:383-96.

Cite this article as: Devi R, Kapoor B, Singh MM. Effectiveness of self-learning module on the knowledge and practices regarding foot care among type ii diabetes patients in East Delhi. *Int J Community Med Public Health* 2016;3:2133-41.