Effect of an Interventional Package on Knowledge and Practices regarding Foot Care among Patients with Diabetes during Covid-19 (July-August 2020)

Neena Vir Singh[1], Latika Bajaj[2], Amandeep Kaur[3], Drishti Bhardwaj[4], Mamta Singh[5], Nidhi Sharma[6], Ramanpreet Kaur[7], Smily Jaswal[8], Sanjay Bhadada[9], Ashu Rastogi[10]

Abstract

Diabetic foot is one of the common diabetes complications that contributes to high morbidity and mortality among patients with diabetes mellitus. The patients having diabetic foot ulcers (DFU) require long period of hospitalisation, with an increased risk of limb amputation and mortality. Promoting foot self care is one of the interventions that may help reduce morbidity due to foot complications. This study aimed to assess the effectiveness of an "Interventional Package" designed for foot care education on knowledge and practices regarding self care among patients with diabetes. The research design was experimental and the approach used was quantitative. A total of 100 patients with diabetes who provided consent for data collection and were available to receive telephonic calls during the study period were enrolled in the study. Purposive sampling of subjects and day randomisation for the grant in control and experimental group was performed. The tool used for baseline data collection was interview schedule comprising of socio demographic profile, clinical profile and questionnaire regarding knowledge and expressed foot care self practice as mean scores. An instructional package was designed for the experimental group incorporating best foot care practices in local language (manual booklet, visual aids and videos) to help improve their knowledge for foot care. Following instructional package, the knowledge of foot care practices was reassessed after an interval of a week. Descriptive and inferential statistics was used to analyse the data. At baseline the mean scores 11.5±1.8 ($p<0.01$) and 11±3.3 ($p<0.05$). For the experimental group the scores came out to be 14.5±2.6 ($p<0.01$) and 12.5±2.9 ($p<0.01$). After the "interventional package" was administered to the experimental group the change in knowledge and practices during the follow-up was expressed as 16.5±2.4 ($p<0.01$) and 15.2±2.8 ($p<0.01$) showing a significant change and in the control group 10.6±2.1 ($p<0.01$) and 10.9±3.4 ($p=0.55$). The study concluded that subjects had poor knowledge and average range of practices about foot care. There was a significant increase in the knowledge and practices of experimental group after intervention. The foot assessment should be conducted during the recurrent visits of the patients and return-demonstrations should be taken from the patients. Also, routine examination of the foot along with adhere to the medicine should be checked.

Key words: Interventional package, effectiveness, knowledge and practices

Diabetic foot is one of the common diabetes complications found in India that contributes to high morbidity and mortality of patients with diabetes mellitus. In India more than 60 million people are diagnosed with diabetes (Kaveeshwar & Cornwall, 2014). The patients having diabetic foot ulcers require long duration of hospitalisation with increased risk of limb amputation; it is considered as one of the most expensive diabetic complications. The devastating complication of diabetic foot ulcers can be easily prevented by providing proper and adequate knowledge to all the patients with DM regarding the foot care. Keeping this in mind the present study was undertaken to help the diabetes patients to have clear understanding about the foot care, to decrease the chances of having the foot ulcers by providing an educational package regarding the foot care. Moreover the current Covid-19 situation poses a threat to all people with diabetes for many infections so the foot care can be important aspect to prevent the chances of infections that can lead to diabetic foot ulcers.

In a cross-sectional study by Department of Surgery, GMERS Medical College, Sola and Department of Surgery, GMERS Medical College, Vadnagar

The authors are 1. Associate Professor, National Institute of Nursing Education, PGIMER, Chandigarh; 2-10. Department of Endocrinology, PGIMER, Chandigarh.

(Gujarat) on the knowledge and practice of foot care among patients of diabetic foot in 2016, 103 participants aged greater than 30 years were enrolled. The results of the study concluded that only 24 (23%) patients had good knowledge, 51 (50%) had satisfactory knowledge and 28 (27%) had poor knowledge about diabetic foot care. Majority of patients, i.e. 53 (51%) had poor practice, 34 (33%) had satisfactory practice and 16 (15%) had good practice.

In a descriptive study conducted on the knowledge, attitudes and practices regarding the diabetic foot by Taibah University in 2017 a random sample of 229 participants were selected from the diabetic outpatient clinic in King Fahd Hospital of the University of Dammam. The results revealed that diabetic foot ulcers were observed among 26 percent of diabetic patients. On the other hand the majority of participants had good education and favourable attitudes towards diabetic foot care. Moreover, despite the good education among the majority of the participants, a high percentage of the participants ignored very important information and instructions before buying new shoes (Al Hariri et al, 2017).

A descriptive study was conducted to assess the knowledge regarding prevention of diabetic foot ulcer among diabetic patients at selected hospitals of Moodbidri and Karkalla, India in 2017 that included a total of 60 people of the age group 30-60 years using purposive sampling technique. The study demonstrated that 40 percent had average knowledge, 38.4 percent of diabetic patients had good knowledge, 10 percent had very good knowledge and 11.6 percent had poor knowledge regarding prevention of diabetic foot ulcer (Salis 2019).

The present study used an interventional package that is used for educating people with all backgrounds whether literate/ illiterate having free and all time access for all people.

Need of the study

Risk of limb amputation is considered as one of the most expensive diabetic complications. The devastating complications of diabetes leading to foot ulcers can be easily prevented by providing proper and adequate knowledge to all the patients with DM regarding the foot care. Keeping this in mind the present study was undertaken to help the diabetes patients to have clear understanding about the foot care, to decrease the chances of having the foot ulcers by providing an educational package regarding the foot care. Diabetic foot is one of the common diabetes complications in India that contributes to high morbidity and mortality of patients with diabetes mellitus. In India more than 60 million people are diagnosed with diabetes. The patients having diabetic foot ulcers requires long duration of hospitalisation, with increased risk of limb amputation, thus considered as one of the most expensive diabetic complications. The devastating complications of diabetes leading to foot ulcers can be easily prevented by providing proper and adequate knowledge to all the patients with DM regarding the foot care.

Diabetic foot contributes to high morbidity and mortality of patients with diabetes mellitus. In India more than 60 million people are diagnosed with diabetes. The present study was undertaken to help the diabetes patients during the Covid-19 pandemic when the access to OPDs was not possible. The study sought to provide clear understanding about the foot care and decrease the risk of having the foot ulcers through an educational package regarding the foot care for patients with diabetes.

Review of Literature

Sir Sunderlal Hospital, Institute of Medical Sciences the School of Biotechnology in collaboration with the Department of Endocrinology and Metabolism, and the Department of General Surgery conducted an observational study to determine risk factors for foot ulceration in diabetic cases of North India. There was a total of 678 study subjects, out of which 97 had diabetic foot ulcers (DFUs). The prevalence of DFUs among diabetic patients was around 14.30 percent out of which 581 patients had no other co-morbidities. Out of the cases with DFUs (n=97), 70.10 percent belonged to rural areas. Age was above 50 years , duration of diabetes 4 to 8 years, and above; rural location, oral hypoglycemic treatment, insulin treatment, and tobacco use were considered to be important risk factors for DFUs and all these had high prevalence of foot ulcers were present in rural patients of North India.

Department of Surgery, GMERS Medical College, Vadnagar, Gujarat conducted a cross-sectional study on the knowledge and practice of foot care among patients of diabetic foot in 2016 in which 103 participants aged greater than 30 years were enrolled. The results concluded that the participants with good knowledge about diabetic foot care were 24 (23%), those with satisfactory knowledge were 51 (50%) and those with poor knowledge were 28 (27%). On the other hand participants having poor practice were 53 (51%), those having satisfactory practice were 34 (33%) and those having good practice were 16 (15%). Due to average knowledge and poor practice that were observed, there was felt need for providing proper knowledge to diabetic patients who had attended the surgery OPD.

University research and intervention centre in the interior of the state of So Paulo conducted a cross sectional descriptive study. In 2005 data collection for 55 patients was carried through interviews, two specific questionnaires, and physical examination of the foot. The results demonstrated

Table 1: Responses recorded for study subjects and scoring

Knowledge scores	Practices scores
(7-11) Poor	(4-9) Poor
(12-16) Average	(10-14) Average
(17-20) Good	(15-19) Good

that for designing educational interventions there is the need to take into consideration specific individual characteristics and interactions with the environment. Moreover, the health care professionals need to understand that the discrepancy between knowledge and behaviours of patients with diabetes is a challenge that needs to be addressed.

A cross-sectional study to access the "Effectiveness of foot care education among people with type 2 diabetes in rural Puducherry, India" was conducted in March 2013, at the Institute Rural Health Centre. All the patients diagnosed with diabetes mellitus who attended the weekly afternoon chronic disease clinic were surveyed. A pre-tested questionnaire was conducted for outpatients of a rural health centre with diabetes mellitus focusing on awareness on diabetes, assessing and scoring the care of diabetes and foot care practices. Individual and group education was performed. After 2 weeks of education foot care practice was reassessed that revealed that 54 percent of them had improvement.

Objectives

The objectives of the study was to assess the effectiveness of an interventional package on knowledge and practices regarding foot care among patients with diabetes.

Hypothesis: Interventional Package will be effective in improving knowledge and practices regarding foot care among the patients with diabetes at $p<0.05$ level of significance.

Materials & Methods

The research approach adopted in the study was quantitative approach using an experimental research design; 100 adults with diabetes in age group 18-70 years with diabetes mellitus with confirmed neuropathy registered with diabetes clinic PGIMER, Chandigarh during July-August, 2020 were enrolled. Contact information of patients was available for the domiciliary setting. Purposive sampling was used for the selection of subjects and day randomisation (alternate OPD days ie patients registered in Wednesday OPD in the control group and those registered in Thursday OPD in the experimental group) was used for the data collection of control and experimental group. The tool and protocol were validated by the experts in the field of nursing, research and endocrinology and the reliability was tested using Cronbach's alpha that was 0.839. A structured telephonic interview for both the control and experimental group was used for the data collection. The interventional package had a booklet in the form of pdf (in local language that patient preferred). A video for the foot care of diabetes patients was used that was provided to the subjects of experimental group whereas for the control group subjects only routine care was provided. After 7 days follow-up for both the groups was done to check the effectiveness of the interventional package.

The questionnaire consisted of part A: Socio-demographic profile of the patient including the information such as age, gender, marital status, type of family, educational status and occupational status. Part B: Clinical profile of the patient included information regarding the blood pressure, co-morbid condition, family history of expressed self-practices diabetes onset and duration of disease, part C: Assessment of knowledge regarding the diabetes mellitus, part D: assessment of practices regarding foot care in patients with diabetes. Each correct response was rewarded with 1 score and incorrect with 0 score, at the end of the questionnaire all the responses were assessed and scoring was done and the responses were categorised as poor, average and good (Table 1).

The interventional package on foot care included an instructional module in form of booklet and a video with Youtube link (https://youtu.be/HPw-CoJKXIn).

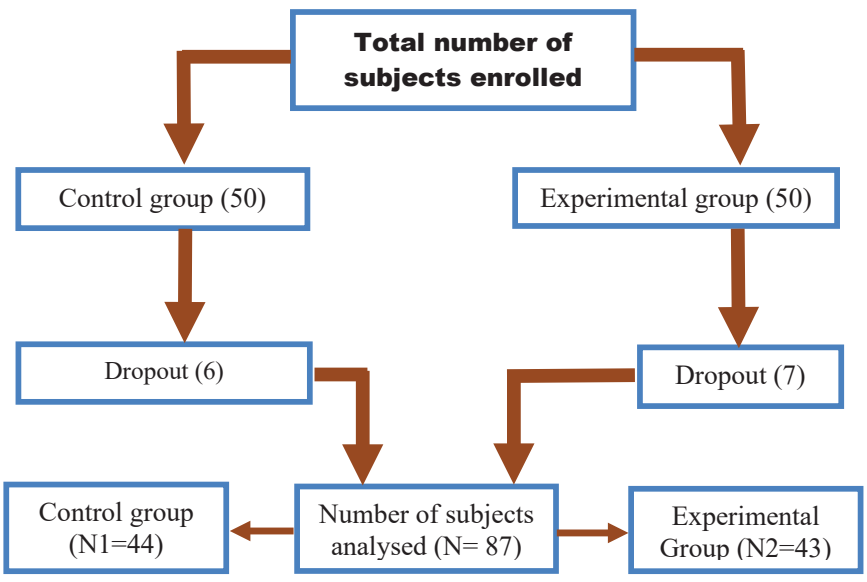

Figure 1: Consort diagram of subjects in the study.

Table 2: Mean scores in pre- and post-test assessment of knowledge and practices regarding the foot care in diabetes mellitus in control and experimental group subjects

Assessment of knowledge/ practice	Pre-test	Post-test	Paired t-test (df) p value
Assessment of knowledge Control group (N_1 = 44) Experimental group (N_2 = 43)	 11.5 ± 1.8 (8-15) 14.5 ± 2.6 (8-20)	 10.6 ± 2.1 (6-14) 16.5 ± 2.4 (10-20)	 3.7(43) < 0.01 4.8(42) < 0.01
Independent t- test (df) p value	-6.36(85) <0.01	-12.9 (85) < 0.01	
Assessment of practices Control group (N_1 = 44) Experimental group (N_2 = 43)	 11 ± 3.3 (5-18) 12.5 ± 2.9(7-19)	 10.9 ± 3.4 (5-18) 15.2 ± 2.8 (7-19)	 0.5 (43) 0.55 6.1 (42) < 0.01
Independent t- test (df) p value	-2.73 (85) < 0.02	-6.35(5) < 0.01	

Results

Telephonic interview for the assessment of the knowledge and practices was conducted among 87 enrolled subjects (control group-44, experimental group-43) in the study.

The knowledge and the practices score between the control and experimental group subjects were compared using the independent t- test. The changes in the scores was p=<0.01 that is statistically significant.

Baseline knowledge and practices for the control group were expressed by the mean scores 11.5±1.8 and 11±3.3 respectively and similarly for the experimental group came out to be 14.5±2.6 and 12.5±2.9. After the interventional package was administered to the experimental group the change in knowledge and practices during the follow-up was expressed as 16.5±2.4 and 15.2±2.8 showing a significant change and in the control group 10.6±2.1 and 10.9±3.4 (Table 2).

Table 3 depicts that in the pre-test of the control subjects, 25 percent had poor and 75 percent had average knowledge regarding the diabetic foot care, whereas in the pre-test of the experimental group 2.3 percent had poor, 67.4 percent had average and 30.2 percent had good knowledge (p=0.01). The pretest for the assessment of the practices of control group revealed 54.5 percent had poor, 36.4 percent had average and 9.1 percent had good practices of the foot care (p=0.01)and for the experimental group 23.3 percent had poor, 62.8 percent had average and 14 percent had good practices.

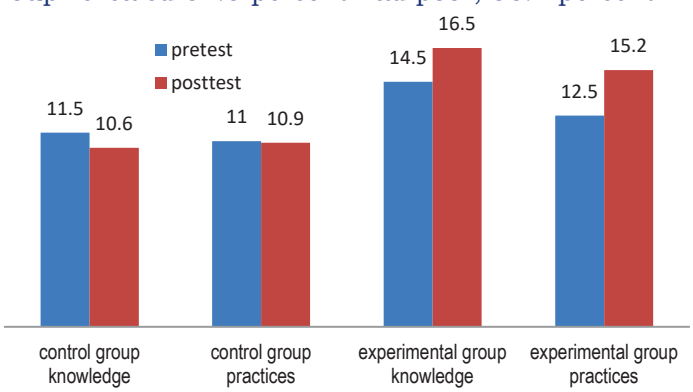

Fig 2: Mean scores of study subjects in pre and post test assessment of knowledge and practices.

The post-test for the assessment of knowledge regarding foot care revealed that 18 percent had poor, 59.1 percent had average knowledge (p=0.01) for the subjects of control group and for the experimental group subjects 2.3 percent had poor knowledge, 30.2 percent had average and 67.4 percent had good knowledge. This meant that there was an increase in the knowledge. Similarly for the practices 56.8 percent had poor, 34.1 percent had average, and 9.1 percent had good practices among the control group and 7 percent had poor, 34.9 percent had average an 58.1 percent had good practices among the experimental group(p=<0.01). The results shows a statistically significant increase in the knowledge and practice

Discussion

The present study is an experimental study done on adults with diabetes mellitus aged between 18-70 years with confirmed diabetic neuropathy registered with diabetes clinic, PGIMER, Chandigarh, whose contact information was made available from the OPD were enrolled in the study. There was purposive sampling of subjects and day randomisation for the grant in control and experimental group. An instructional package was designed and a video made and circulated to improve the knowledge practices of the subjects regarding foot care after assessing their previous knowledge. Keeping this in mind the present-day study was undertaken to help the diabetes patients to have clear understanding about the foot care, to decrease the chances of having the foot ulcers by providing an educational package regarding the foot care. In the present study the research was conducted on accessible population who met the inclusion criteria. The enrolled subjects then, by day randomisation were grouped into control and experimental group and telephonic consent was taken by them. The subjects in experimental group received interventional package while both the groups gave a pretest and post-test was taken from both the groups after one week.

The present study showed that means age in control group was (56.97±7.30) and experimental group (59.6±6.80). The subjects in the control group were 50 percent male and 50 percent female

Table 3: Scores of study subjects in pre-and post-test assessment of knowledge and practices

	Pre-test			Post-test		
Assessment of knowledge practice	Control group (N_1 =44) n (%)	Experimental group (N_2 =43) n (%)	Chi square (df), p value	Control group (N_1 =44) n (%)	Experimental group (N_2=43) n (%)	Chi square (df), p value
Assessment of knowledge Poor (7-11) Average (12-16) Good (17-20)	 11 (25%) 33 (75%) 0	 1 (2.3%) 29 (67.4%) 13 (30.2%)	21.5(2)<0.01	 18 (40.9%) 26 (59.1%) 0	 1 (2.3%) 13 (30.2%) 29 (67.4%)	48.5 (2)<0.01
Assessment of practices Poor (4-9) Average (10-14) Good (15-19)	 24 (54.5%) 16 (36.4%) 4 (9.1%)	 10 (23.3%) 27 (62.8%) 6 (14%)	8.96 (2)0.01	 25 (56.8%) 15 (34.1%) 4 (9.1%)	 3 (7%) 15 (34.9%) 25 (58.1%)	32.4 (2)<0.01

while experimental group had majority males (86%). Major subjects in the control group resided in rural area, 68 percent and if experimental group major resided in urban area, 60.5 percent. Most of the study subjects were married and majority of subjects in the study have completed their secondary education.

On the contrary to the present study, a study at Sir Sunderlal Hospital, Institute of Medical Sciences, the school of Biotechnology in collaboration with the department of Endocrinology and Metabolism, and The Department of General Surgery was conducted to determine risk factors for foot ulceration in diabetic cases of North India. There was a total of 678 study subjects, out of which 97 had diabetic foot ulcers (DFUs). The prevalence of DFUs among diabetic patients came out around 14.30 percent out of which 581 patients had no other co-morbidities with the diabetes, out of the cases with DFUs (n 97), 70.10 percent belonged to the rural areas. The age was above 50 years, duration of diabetes 4 to 8 years, and >8 years, rural location, oral hypoglycemic treatment, insulin treatment and tobacco use were considered to be important risk factors for DFUs and all these had high prevalence of foot ulcers.

The present study showed that majority of subjects had normal BMI that is 54.5 percent in control group and 44.2 percent in experimental group. Majority of the subjects had previous history of hypertension, 38.6 percent in control group and 39.5 percent in experimental group. Majority of people in both the groups had diabetes for 11-22 years 45 percent in the control group and 53.5 percent in experimental group; 36.4 percent in control group had a family history of diabetes and 51.2 percent in experimental group. Majority of people had previously allopathic treatment 90.9 percent in control group and 76.3 percent in experimental group. Presently, majority of subjects are taking oral anti-diabetic agents 56.8 percent in control group and 48.8 percent in experimental group.

A similar study conducted at a regional hospital in Durban, South Africa, in 2016, on awareness of diabetic foot in patients having type 2 diabetes mellitus attending the chronic outpatients department with 200 participants found that majority of participants were either overweight or obese. More than half reported the co-morbidities that is 92 percent with associated hypertension (57.5%), dyslipidemia (26.7%), eye disease (7.2%), 76 percent altered sensation in lower limbs and 90 percent reported to have undergone examination of feet, but when they experienced a problem (Goi & Naidoo, 2016).

In the present study on comparing the mean score of control and experimental group in the pre-test and post-test related to the assessment of knowledge and practices. The response of control and experimental subjects in the pre-test assessment of knowledge was 11.5±1.8 (8-15) and 14.5±2.6 (8-20) respectively (p≤0.01). Similarly, for the assessment of practices the mean was 11±3.3 (5-18) for control group and 12.5±2.9 (7-19) for experimental group (p=0.02). The mean response in the post-test assessment of knowledge showed improvement in the scores 10.6±2.1 (6-14) and 16.5±2.1 (10-20) respectively (p≤0.01). Similarly, for the assessment of practices mean -10.9±3.4 (5-18) for the control group and 15.2±2.8 (7-19) for experimental group (p=0.01), indicated an increase in the level of knowledge and practices related to self foot care.

In a similar study conducted to assess the "Effectiveness of foot care" education among people with type 2 diabetes in rural Puducherry, India, at the Institute of Rural Health Centre during March 2013, in which all the patients diagnosed with diabetes mellitus who attended the weekly afternoon chronic disease clinic underwent a pre-tested questionnaire focusing on awareness on diabetes, assessing and scoring the care of diabetes and foot care practices. Individual and group education was performed. After 2 weeks of education foot care practice was reassessed that revealed that 54 percent were conscious about the reduced

foot sensation and foot ulcers could occur due to diabetes, nearly 53 percent and 41 percent of the patients had good awareness of diabetes and the associated care and only 22 percent of the patients had their feet assessed by a health care worker or a physician. Average score for foot care practices improved from 5.90±1.82 to 8.0±1.30. Two weeks after health education given there was improvement in the practices related to toe space examination, foot inspection and foot wear inspection also improved maximally. The study concluded that there could be an effective reduction in the burden of diabetic foot ulcer and foot care practices could improve by providing education on foot care in a primary care setting (Saurabh et al, 2014).

In the present study for assessment of knowledge and practices in control group 18 (40.9%) had poor score and in group 26 (59.1%) had average knowledge about foot care whereas in experimental group 1 (2.3%) scored poorly, group 13 (30.2%) scored average and in group 29 (67.4%) had good knowledge about foot care. On assessing the practices in the control group 25 (56.8%) had poor practices, group 15 (34.1%) had average and group 4 (9.1%) had good practices and in experimental group 3 (7%) had poor practices, group 15 (34.9%) average and group 25 (58.1%) had good practices in the post-test. There was found to be significant increase in the knowledge and practices of experimental group after the intervention.

In a similar study conducted on the knowledge and practice of foot care among patients of diabetic foot in 2016 by Department of Surgery, GMERS Medical College, Sola and Department of Surgery, GMERS Medical College Vadnagar, Gujrat in which 103 participants greater than 30 years were enrolled. The results of the study concluded that only 24 (23%) patients had good knowledge, 51 (50%) patients had satisfactory knowledge and 28 (27%) had poor knowledge about diabetic foot care. Majority, of patients, that is 53 (51%) had poor practice, 34 (33%) had satisfactory practice and 16 (15%) had goof practice (Sutariya & Kharadi, 2016).

Limitations

The present study was conducted during Covid-19 pandemic; therefore, it was of short duration, sample size was also small. The study could be carried on a large group and with more follow-up intervals so that a more significant change could come out.

Recommendations

- A similar study on a large group in the hospital setting with face-to-face interview and providing teaching specifically on one to one basics and having more follow-up intervals could be conducted.
- A similar study including the concept of foot assessment during the first visit and re-demonstration of the foot care practices could also be undertaken.
- A similar study to assess the effectiveness of foot care interventional package compliance among the patients can be carried out.

Conclusion

The interventional package constituting a booklet "Foot care for diabetes patients" and a video uploaded on the you tube was effective in helping the people with diabetes in improving their knowledge and practices regarding self foot care as manifested by pre-test and post-test results. Thus better knowledge and practices about foot care can help in reducing the risk and chances for persons with diabetic foot ulcers.

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