

# A Study to assess the impact of foot care instruction on diabetic foot practices in a selected community

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**Abstract-** Several population-based studies report an annual incidence of diabetic foot ulceration in the range of 2% to 3% in IDDM and NIDDM patients, whereas the prevalence varies between 4% and 10%. These studies also indicate a general trend for higher frequencies of ulceration with increasing age and duration of diabetes. A 3-year retrospective cohort study of 8905 patients in a large health maintenance organization who have diabetes reported a 5.8% cumulative incidence of ulceration (approximately 2% per year).

In India diabetes mellitus has become an epidemic with more than 67 million diabetic individuals currently diagnosed with the disease. Patients are losing their savings because of the complications of diabetes like ischemic heart disease, myocardial infarction, chronic kidney disease, diabetic retinopathy and diabetic foot ulcer.

This study was done to emphasize the importance of education in preventing foot ulcer among the diabetic patients. A sensitized patient towards the complications of diabetic foot ulcer and the ideal foot practices in daily life will have less chances of landing up in amputation. Hence, video demonstration was used as a medium of instruction and pre-test and post test were conducted on the study population with control sample. The difference in foot practice was proven by the improved scores in post-test in the experiment group.

**AIM:** To assess the effectiveness of foot care instruction on practice among patients with diabetes mellitus in a selected community at kanyakumari district.

**RESULTS:** In the experimental group significant mean score difference was seen between pre-intervention and post-intervention knowledge status.

The level of practice was studied on different aspects of diabetic foot care. In practice also significant mean score difference was seen with experimental group after intervention in the aspects of foot care (t= 15<sup>th</sup> day- 31.84, 30<sup>th</sup> day- 30.48 df=58 P < 0.05) and foot wear practice (t= 15<sup>th</sup> day-29.91, 30<sup>th</sup> day- 32.31 df=58 P < 0.05).

**CONCLUSION:** The study concluded that teaching with video demonstration had an effect on foot care practices among the diabetic patients. It improved their level of practice regarding diabetic foot care and ensuring the safety of the patients and minimizing the risk of diabetic foot ulcer and amputation.

**Index Terms-** diabetes, diabetic foot care, education, knowledge, prevention.

## I. INTRODUCTION

In 2011, diabetes resulted in 1.4 million deaths worldwide, making it the 8th leading cause of death. Unfortunately, once sustaining an ulceration, recurrence rates can reach 50% at 2 years and 70% at 5 years. Patients who have diabetic foot ulcers have also been determined to have an increased risk for mortality when compared with non-ulcerated counterparts. Boyko reported a 2.4-fold risk of death in patients who have diabetic ulcers after adjustment for age, duration, glucose control, amputation, and smoking history. Ramsey, in a 1999 retrospective cohort study of 8905 patients with diabetes, reported a 3-year survival of only 72% in those with foot ulcers versus 87% in age and sex-matched non-ulcerated patients. In a recent single-prospective cohort study of patients with new diabetic foot ulcers, the 5-year mortality rate was 44%, although there was no reported comparison with non-ulcerated cohorts.

Mortality was highest (55%) in those patients who had ischemic ulcers. Amputation is one of the more prevalent major complications of diabetes mellitus, accounting for 86,000 diabetes-related discharges in 1996. Approximately 80% to 85% of lower extremity amputations (LEA) are preceded by foot ulceration. The number of people with diabetes is expected to rise to 592 million by 2035. Untreated, diabetes can cause many complications. Serious long-term complications include [heart disease](#), [kidney failure](#), and [damage to the eyes](#) and diabetic foot ulcer. The term "Diabetic Foot" is used to refer to a variety of pathologic conditions that may affect the feet of people with diabetes. All Diabetes mellitus patients require effective education regarding prevention of foot injuries, foot care because diabetes initially causes poor circulation and nerve damage and leads to injury.

In order to prevent these complications of diabetic foot, we devised a strategy of video demonstration and wherever feasible individual instructions to improve their knowledge regarding foot practices.

## II. OBJECTIVES

- To describe the background of the diabetic patients who will be interviewed.
- To determine whether the foot care instruction makes any difference in the knowledge and practice of foot care among diabetic patients

### III. MATERIALS AND METHODOLOGY

Study population: The population included all the adults with Type 2 Diabetes Mellitus residing in the selected community at Kanyakumari.

Study period: Dec 2013-2015

Sample size: 60

Sample selection : Systematic random sampling method was used.

#### INCLUSION CRITERIA

- Both males & females.
- Age above 35.
- Known case of diabetes above 2 years.
- Adults with Type 2 Diabetes Mellitus and those who are willing to participate in the study.
- Those who understood Tamil.

#### EXCLUSION CRITERIA

- Those who had training about diabetic foot care.
- Those who were critically ill.
- Those who are bedridden.
- Those with the history of diabetic foot ulcers.
- Those with the history of peripheral vascular disorders or any other co morbid conditions.
- Hearing problem
- Visual problem

#### PROCEDURE

Study was begun after approval from the institutional ethical board. A prior permission was obtained from the Municipal Council, primary health center, village health nurse, church committee, priest, clients and their family members.

The conceptual frame work used in this study was based on modified Orem’s self care model (2004). A true experimental pre and post test control group design was used to determine the effect of individualized instruction on foot practices of among the adults with type 2 diabetes mellitus. The sample of 60 patients was selected who were on treatment for diabetes. Selection was done by systemic random sampling method. Samples were randomly assigned to control and the experimental group 30 in each. The data from the samples were collected by using a structured interview schedule and observational checklist. The data was analyzed using descriptive and inferential statistics. A pretest was given to both experimental and the control group. An individualized teaching with video demonstration on diabetic foot care was given to the experimental group after the pre-test. Post-test was conducted on 15<sup>th</sup> and 30<sup>th</sup> day.

Statistical analysis: By descriptive and inferential statistics.

Frequency and percentage distribution were used to analyze demographic variables and to assess practice regarding diabetic foot care.

Mean and mean score percentages were used to determine the difference in the level of practice regarding diabetic foot care. Unpaired ‘t’ test was used to determine the significant difference in the level of practice in different areas on diabetic foot in experimental and the control group.

‘Chi square test’ was used to assess the association of selected demographic variables with the level of practice.

### IV. RESULTS

#### A. Demographic characteristics of the sample

**Table 1**

**FREQUENCY AND PERCENTAGE DISTRIBUTION OF EXPERIMENTAL AND CONTROL GROUP ACCORDING TO PERSONAL CHARACTERISTICS N=60**

S.No.	Demographic Characteristics	Experimental group (N=30)		Control group (N=30)	
		Frequency	Percentage	Frequency	Percentage
1.	Age				
	a) 36– 45 Years	2	6.7	2	6.7
	b) 46 –55 Years	9	30.0	7	23.3
	c) 56 – 65 Years	12	40.0	13	43.3
	d) >65 Years	7	23.3	8	26.7
2.	Sex				
	a) Male	13	43.3	15	50.0
	b) Female	17	56.7	15	50.0
3.	Education				
	a) Illiterate	5	16.7	2	6.7
	b) Primary	10	33.3	7	23.3
	c) Secondary	8	26.7	9	30.0
	d) Collegiate	7	23.3	12	40.0

4.	Marital status				
	a) Married	25	83.3	17	56.67
	b) Unmarried	2	6.7	4	13.33
	c) Widow	3	10.0	5	16.67
	d) Separated	-	-	4	13.33
5.	Occupation				
	a) Farmer	1	3.3	-	-
	b) Laborer	6	20.0	13	43.3
	c) Private employee	4	13.3	4	13.3
	d) Government employee	3	10.0	3	10.0
	e) Unemployed	16	53.3	10	33.3
6	Religion				
	a) Hindu	2	6.7	1	3.3
	b) Christian	28	93.3	29	96.7
	c) Muslim	-	-	-	-

Table-1 Presents frequency and percentage distribution of experimental and control group samples according to personal characteristics

**TABLE – 2**  
**FREQUENCY AND PERCENTAGE DISTRIBUTION OF EXPERIMENTAL AND CONTROL GROUP ACCORDING TO DISEASE CHARACTERISTICS**  
**N=30**

SL No	Disease characteristics	Experimental group (N=30)		Control group (N=30)	
		Frequen	Percentag	Frequen	Percenta
1	History of Diabetes Mellitus				
	a. 2-4Year	10	33.3	12	40.0
	b. 5-7 Years	8	26.7	5	16.7
	c. 8-10years	4	13.3	8	26.7
	d. >10years	8	26.7	5	16.7
2	Treatment measures followed				
	a. Oral hypoglycemic Agents	22	73.3	23	76.7
	b. Insulin	4	13.3	1	3.3
3	Presence of comorbid illness				
	a. No	17	56.7	14	46.7
	b. Yes	13	43.3	16	53.3
4	Smoking habit				
	a. No	28	3.3	26	86.7
	b. Yes	2	6.7	4	13.3
5	Blood sugar				
	a. 100-150mgs/dl	10	33.3	15	50.0
	b. 151-200 mgs/dl	8	26.7	7	23.3
	c. 201-250 mgs/dl	6	20.0	3	10.0
	d. 251-300 mgs/dl	4	13.3	3	10.0
	e. >301 mgs/dl	2	6.7	2	6.7

6	Results of latest urine test?				
	a. Not Done				
	b. Done	30	100.0	30	100.0
		-	-	-	-
7	Results of latest HbA1C?				
	a. Not Done	30	100.0	30	100.0
	b. Done	-	-	-	-

Table-2 shows the frequency and percentage distribution of experimental and control group according to disease condition and treatment information.

**Table value- 2**

**Table -3**

**FREQUENCY AND PERCENTAGE OF THE EXPERIMENTAL AND CONTROL GROUP ACCORDING TO OVERALL LEVEL OF PRACTICE REGARDING DIABETIC FOOT CARE BEFORE AND AFTER INTERVENTION  
N=60**

Level of Practice	Experimental Group N=30						Control Group N=30					
	Before Intervention			After Intervention			Base line Observation		Subsequent Observations			
	n			15th day			n		15th day		30th day	
	F	%		F	%		F	%	F	%	F	%
Good	-	-		30	100		30	100	-	-	-	-
Average	30	100		-	-		-	-	30	100	30	100
Poor	-	-		-	-		-	-	-	-	-	-

Table 3 shows the frequency and percentage of experimental and control group according to level of overall practice regarding diabetic foot care before and after intervention.

**Table-4**

**Comparison of overall mean practice score and standard deviation in experimental and control group before and after intervention and level of significance  
N=60**

Level of practice	Max. Score	Experimental Group N = 30			Control Group N = 30			MD	Un paired 't' value P<0.05
		Mean score	Mean score	SD	Mean score	Mean score	SD		
Before intervention	87	42.26	48.57	4.52	41.53	47.73	4.52	0.733	NS
15th day after intervention	87	79	90.80	2.65	43.67	50.20	6.80	35.33	39.83*
30th day after intervention	87	80.53	92.56	0.41	43.57	50.08	0.84	36.97	39.63*

\*-Significant. NS- Not Significant

Table value -2

Table-4 shows comparison of overall mean practice score and standard deviation of experimental and control group before and after intervention and level of significance.

**TABLE -5**

**mean practice score and standard deviation of experimental and control group in different aspects of diabetic foot care practice on 30<sup>th</sup> day after intervention and level of significance  
 N=60**

Aspects of Practice	Max Score	Experimental Group N = 30			Control Group N = 30			MD	Un paired 't' value P<0.05 df=58
		Mean	Mean %	SD	Mean	Mean %	SD		
Foot care practice	48	45.03	93.81	1.27	26.07	54.31	3.16	18.97	30.48*
Foot wear practice	39	35.50	91.02	1.61	17.50	44.87	2.61	18.00	32.13*

\*-Significant. NS- Not Significant.

**Table value- 2**

Table-5 shows mean practice score and standard deviation of experimental and control group in different aspects of diabetic foot care practice on 30<sup>th</sup> day after intervention and level of significance.

**V. DISCUSSION**

In the experimental group all the samples 30(100%) had average level of practice before intervention. On the 15<sup>th</sup> and 30<sup>th</sup> day after intervention, all the samples 30(100%) had good level of practice. Whereas in the control group, all the samples 30(100%) had average level of practice on the baseline observation. In the subsequent observation on 15<sup>th</sup> day and 30<sup>th</sup> day, there were no changes in the level of practice.

In the experimental group overall mean practice score before intervention was 48.57% whereas in control group the score was 47.73%. Statistically there was no significant difference in the mean practice score between experimental and the control group before intervention with 't' value 0.733(p<0.05, df=58).

On the 15<sup>th</sup> day of observation the mean practice score increased from 42.26% to 79 % in experimental group, where as in control group the mean practice score 47.73% to 50.02% Statistically there was a significant difference in mean practice score between experimental and control group on 15th day after intervention with 't' value 39.83% (p<0.05, df=58). On the 30th day of observation the mean practice score increased from 42.26 to 80.53% in experimental group, whereas in control group the mean score increased from 47.73% to 50.8.% Statistically there was a significant difference in mean practice score between experimental and control group on 30<sup>th</sup> day after intervention with 't' value 39.63(p<0.05, df=58).

On the 30<sup>th</sup> day after intervention, the percentage of mean practice score on various aspects of practice increased slightly with a range of 91.02 % - 93.81% in the experimental group, the highest score was observed in a the aspect of foot care practice 93.81%, and the next score in the aspect of foot wear practice 91.02%.

Whereas in the control group the mean practice score remained almost in the same range 44.87% -54.31% percentage, the highest score was in the aspect of foot care practice 54.31% and the least score was in the aspect of foot wear practice 44.87%.

Statistically, there was a significant difference in the mean practice score in the aspect of foot care practice ['t' value 30.48(p<0.05, df=58)] and foot wear practice ['t' value 32.13(p<0.05, df=58)] between the experimental and control group.

**VI. CONCLUSION**

In conclusion, since diabetic foot ulcers leading to foot amputation and below knee amputation have become a burden on health care system, we must act to increase the knowledge of foot practice among diabetic patients.

If interventions like video display and demonstrations regarding foot care can cause a significant difference in foot care practices (which in turn can decrease the incidence of foot ulcers and resulting amputations) among the diabetic patients as shown in this study, then we should adopt a nationwide policy on the same so that even the poorest of the patients is benefitted.

India's economy will improve with less expenditure on these preventable complications.

This again emphasizes the fact that prevention is better than cure.

**APPENDIX**

**A. Rating scale**

It was used for assessing the practice of diabetic foot care. It consisted of 29 items, grouped under two areas: foot care practice and footwear practice. The rating scale was 0-3 to mark the presence or absence of the activity in diabetic foot care before and after the intervention on 15<sup>th</sup> and 30<sup>th</sup> day. Rating scale

**B. Scoring and interpretation of scoring**

Structured interview question schedule on knowledge was designed and minimum obtainable score was 0 and maximum 20.

Score	Grading
14 to 20	Good
7 to 13	Average
0 to 6	Poor

**C. Observational checklist on the technique of self administration of insulin.**

**D.**

The score of 3 was excellent activity, score of 2 was good activity, 1 was average activity and 0 score was absence or poor activity of foot care. Minimum obtainable score was 0 and maximum was 87.

Score	Grading
59 to 87	Good
30 to 58	Average
0 to 29	Poor

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