

Original Research Article

## **Risk of Developing Diabetic Foot, Practice and Barriers in Foot Care among Client with Type II Diabetes Mellitus**

Soumya S<sup>1</sup>, Adithya K Ajith<sup>2</sup>, Aparna K<sup>2</sup>, Deepa VK<sup>2</sup>, Prajisha V<sup>2</sup>, Rinsha C<sup>2</sup>, Shinumol V<sup>2</sup>

<sup>1</sup>Assistant Professor, MIMS College of Nursing Vadakkedath Paramba, Vazhayoor, Near Ramanattukara, Malappuram District, Puthukode, Kerala-673633.

<sup>2</sup>SIMET College of Nursing, Kannur.

Corresponding Author: Soumya S

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### **ABSTRACT**

The main objective of the study is to identify the risk group who are more prone to develop diabetic foot among client with type II Diabetes Mellitus and to determine the practice and barriers of foot care in those clients. The design used in the study is Non experimental descriptive survey design. Study was conducted in May 2016, among 110 type II Diabetes Mellitus patients who fulfill our criteria in Sisters Diabetic Clinic, Kannur. Data obtained includes socio demographic data, risk assessment, practice and barriers of foot care.

The collected data was analyzed by descriptive and inferential statistics. The study reveals in total there were 68 patients who are having high and moderate risk of developing diabetic foot. Among them 16 patients had very bad practice and 39 patients had bad practice scores. The study also identified the barriers in foot care among high and moderate risk patient and the most identified barrier among those patients are lack of awareness about importance of foot care and lack of adequate education regarding foot care properly. The study also reveals that among 42 low risk groups identified, 20 patients had very good practice, 5 patients had good practice and 17 patients had bad practice. This is relevant to note that with low practice these patients may eventually fall into high risk group.

**Key words:** Diabetic foot, risk, barriers, foot care, practice.

### **INTRODUCTION**

Lower limb conditions such as diabetic neuropathy, peripheral vascular disease, ulcers and limb amputations are seen twice in diabetics compared to non-diabetics patients. It has a social and economic impact on families, health system and in society in both developing and developed countries. [1] So adequate foot care is mandatory to prevent complications.

In India, the prevalence of Diabetic foot ulcers in the clinic population is 3.6%. Socio cultural practices such as bare foot walking, religious practices like walking on fire, use of improper foot wear and lack of

knowledge regarding foot care increases prevalence of foot complications in India. [2]

The purpose of the study is to determine the risk of developing diabetic foot and their practices and barriers in foot care among type II Diabetes Mellitus patients and thereby reduce the burden and risk of foot complications among them.

**The objectives of this study are to:-**

1. Identify the risk of developing diabetic foot among clients with type II Diabetes Mellitus.
2. Determine the practice of foot care among clients with type II Diabetes Mellitus.

3. Assess the barriers in foot care among clients with type II Diabetes Mellitus.
4. Assess association between practice of foot care and selected demographic variables

## MATERIALS AND METHODS

A Non experimental descriptive study was conducted in Sister's Diabetic clinic at Chiravakku, Taliparamba, Kannur among 110 patients. Patients who had developed foot ulcers were excluded from the study. Tools used in the study were Demographic and Clinical Proforma, tool for risk assessment of developing diabetic foot, tool to assess self-reported practice on foot care and tool to assess barriers in diabetic foot care.

**Demographic and Clinical Proforma:** deals with the description of subjects based on age, gender, religion, marital status, type of family, monthly family income in rupees, educational status, occupation, current physical activity, type of food, family history of life style diseases and duration of Diabetes Mellitus.

**Tool for risk assessment of developing diabetic foot** consists of four criteria and based on the result the patient will be categorized into:-

**Low risk group:** This includes those patients in which we were:

- Able to detect at least one pulse at foot
- Able to feel 10gm monofilament.
- No foot deformity, physical or visual impairment, no previous ulcer.

**Moderate risk group:** This includes those patients in which we were:

- Unable to detect more pulse in foot
- Unable to feel 10 gm monofilament
- Foot deformity, Unable to see or reach foot

**High risk group:** This includes those patients in which we were:

- Previous ulceration or amputation
- Absence pulses
- Unable to feel 10gm monofilament

or one of the above with callus or deformity.

**Tool to assess self reported practice on foot care** consists of 15 self reported questionnaires. Each of the questions consists of four options which were scored ranging from four to one; except the question number 11, 12 and 13 which was negatively scored. So the maximum score obtained by a patient was 60 and minimum score obtained was 15. Based on the score obtained patients were classified into 4 categories arbitrarily, which include those having:

Very bad practice: 15 - 26 Score

Bad practice: 27-38

Good practice: 39-48

Very good practice: 49-60

**Tool to assess barriers in diabetic foot care among type II Diabetes Mellitus patients** consists of 12 'yes' or 'no' questions to assess the barriers in diabetic foot care among type II Diabetes Mellitus patients. The clients are supposed to select the most appropriate barrier he or she faced which prevents them in performing foot care.

First researchers identified the patients with risk by using criteria described in tool for risk assessment of developing diabetic foot. The patients with high and moderate risk were given Demographic and Clinical Proforma, tool to assess self-reported practice on foot care and tool to assess barriers in diabetic foot care to complete. From these patients self-reported practice and barriers for foot care were identified. The researchers assumed that patients with low risk can also have low practice. So Demographic and Clinical Proforma, tool to assess self-reported practice on foot care and tool to assess barriers in diabetic foot care were given to these patients too.

### Statistical Analysis

Data were analyzed by using descriptive and inferential statistics. Frequency, percentage and Chi square were used in this study.

## RESULTS

**Table 1: Showing frequency percentage of socio demographic variable n=110**

	Frequency	Percentage
<b>Age in years</b>		
41-50	13	11.8
51-60	30	27.2
61-70	34	30.9
71-80	33	30.0
<b>Gender</b>		
Male	65	59.1
female	45	40.9
<b>Religion</b>		
Hindu	41	37.2
Muslim	52	47.2
Christian	17	15.5
<b>Marital Status</b>		
Married	110	100
Unmarried	-	-
<b>Monthly family Income</b>		
Less than 10,000	51	46.4
10,000-19,000	38	34.5
20,000-30,000	17	15.5
More than 30,000	4	3.6
<b>Educational Status</b>		
Upper primary	10	9.1
High School	46	41.8
Predegree/+2	22	20
Diploma	8	7.3
Under graduate	19	17.3
Post graduate and above	5	4.5
<b>Physical Activity</b>		
Walking	55	50
Jogging	7	6.3
Bicycling	4	3.6
No exercise	44	40
<b>Family history of life style disease</b>		
Diabetes Mellitus	54	49
Hypertension	36	35.5
Heart disease	7	6.4
Other disease	10	9.1
<b>Duration of Diabetes Mellitus</b>		
Less than 1 year	8	7.3
1-5 year	45	40.9
6-10 year	37	33.6
11-15 year	14	12.7
>15 year	6	5.5

Majority 30.9% sample belongs to age group of 61-70, 30% belongs to 71-80 age groups and 11.8% belongs to 41-50 years of age. Majority 59.1% (65) of samples were males and 40.9% (45) participants were females. Majority 47.2% of participants were Muslims, 37.2% were Hindus and only 15.5% were Christians. All the samples were married. Majority 46.4% had monthly family income of Rupees less than 10,000. Only 3.6% had monthly family income more than Rs/-30,000. Majority 41.8% of samples studied up to High school, 20% up to pre degree/+2, 17.3% up

to under graduate level and 4.5% up to post graduate level or above.

The half of the patients have physical activity of walking it are noted that 40% of samples do not perform any exercises to control Diabetes Mellitus. Out of 110 samples 6.3% patients performing jogging, 3.6% does bicycling.

Majority 49% of samples had history of Diabetes Mellitus in their family, 35.5% of samples had history of Hypertension in their family, 6.4% of samples had history of heart diseases in their family and 9.1% of samples had history of other diseases than these in their family.

Majority 40.9% of samples were diagnosed as Diabetes Mellitus for 1-5 years, 33.6% of samples were diagnosed as Diabetic Mellitus for 6-10years, 12.7% of samples were diagnosed as Diabetes Mellitus for a period of 11-15 years, 7.3% of samples were diagnosed as having Diabetes Mellitus for less than 1 year, 5.5% of samples were diagnosed as having Diabetes Mellitus for greater than 15 years.

### Risk assessment of developing diabetic foot among type II Diabetes Mellitus patients

**Table 2: Showing frequency percentage of risk of developing diabetic foot among type II Diabetes Mellitus Patient n= 110**

Risk	Frequency	Percentage
High risk	40	36.3
Moderate risk	28	25.4
Low risk	42	38.1

Table 2 shows that majority 38.1% belongs to low risk group, 36.3% have moderate risk for developing Diabetic foot and 25.4% of samples belongs to moderate risk.

### Part III: Self reported practice on foot care among type II Diabetes Mellitus

Among 110 samples 40 samples were identified as having high risk for developing diabetic foot. These samples were selected and practice levels of them were identified.

**Table 3: showing frequency percentage of practice of high risk patients n=40**

Practice	Frequency	Percentage
Very bad	16	40
Bad	24	60

Table 3 shows that among 40 high risk patients, majority 60% of patients had bad practice and 40% of patient had very bad practice.

Table 4: showing frequency percentage of practice of moderate risk patient. n=28

Practice	Frequency	Percentage
Bad	15	53.4
Good	13	46.4

Among 110 samples 28 patients were identified as having moderate risk. These samples were selected and practice levels of them were identified.

Table 4 shows that among 28 moderate risk patients, majority 53.4 % of patients had bad practice and 46.4 % of sample had good practice.

Table 5: showing frequency percentage of low risk patients. n=42

Practice	Frequency	Percentage
Very good	20	47.5
Good	5	11.9
Bad	17	40.4

Among 110 samples, 42 samples were identified as having low risk. These patients were selected and practice levels of them were identified.

Table 5 shows that among 42 low risk patients, majority 47.6% of patients had very good practice, 11.9% of patient had good practice and 40.4% of patients had bad practice.

#### Part IV: Assessment of barriers in diabetic foot care among type II Diabetes Mellitus patient

Among the high risk patients, most frequently reported barrier was 1<sup>st</sup> and 7<sup>th</sup> item in the barrier tool and least reported item was 3. I.e. majority of patients reported that they were unaware of importance of foot care and have never received adequate education regarding how to care foot appropriately.

### Association between practice of foot care and selected demographic variables

Table 6: Table showing association between practice of foot care and selected demographic variables among type II Diabetes Mellitus patients.

Sl no	Socio demographic variable	Practice				chi <sup>2</sup> value	df	Level of significance	Inference
		Very bad practice	Bad practice	Good practice	Very good practice				
1	<b>Age</b>					19.4	9	0.04	S
	41-50	5	6	2	-				
	51-60	7	14	3	6				
	61-70	4	15	10	5				
	71-80	7	17	2	7				
2	<b>Gender</b>					0.09	3	1	NS
	Male	9	33	11	12				
	Female	7	23	7	8				
3	<b>Religion</b>					10.9	6	0.12	NS
	Hindu	7	21	6	7				
	Muslim	8	22	12	10				
	Christian	1	12	-	3				
4	<b>Type of family</b>					1.3	3	0.75	NS
	Nuclear	10	34	13	11				
	Joint	6	22	5	9				
5	<b>Monthly family Income</b>					9.9	9	0.44	NS
	Less than 10,000	9	28	8	6				
	10,000-19,000	5	16	5	12				
	20,000-30,000	1	10	4	2				
	>30,000	1	2	1	-				
6	<b>Educational status</b>					16.3	15	0.52	NS
	Upper primary	3	6	-	1				
	High school	3	25	9	8				
	Pre degree/ +2	4	13	4	2				
	Diploma	1	2	2	3				
	Under graduate	4	8	3	4				
	Post graduate	1	2	-	2				
7	<b>Occupation</b>					6.67	9	0.71	NS
	Coolie	6	8	2	3				
	Private	4	13	6	7				
	Government	3	13	4	4				
	Others	3	22	6	6				
8	<b>Current physical Activity</b>					7.9	9	0.70	NS
	Walking	8	26	10	11				
	Jogging	-	5	-	2				
	Bicycling	-	2	1	1				
	No exercise	16	56	18	20				

Continued..... table 6									
9	<b>Type of food</b>					6.8	6	0.45	NS
	Vegetarian	-	1	-	1				
	Non Vegetarian	16	50	15	16				
	Diabetic diet	-	5	3	3				
10	<b>Family history of life style disease</b>					25	9	0.04	S
	Diabetes Mellitus	12	20	14	8				
	Hypertension	3	25	2	9				
	Heart disease	1	4	2	-				
	Other disease	-	7	-	3				
11	<b>Duration of years with Diabetes Mellitus</b>					26.6	12	0.02	S
	Less than 1 year	-	6	2					
	1-5 year	9	14	11	11				
	6-10 year	6	23	2	6				
	11-15 years	-	11	2	1				
	>15 years	1	2	1	2				

It is evident that demographic variables age, family history of life style disease and duration of years with Diabetes Mellitus had a significant association with the practice. Demographic variables such as gender, religion, type of family, monthly family income, educational status, occupation, current physical activity and type of food had no significant association with practice. As all the samples come under married status association cannot be found with that variable.

## DISCUSSION

Discussion is described under following headings:

### Risk of developing Diabetes Mellitus

In this study among 110 samples, 36.3% had high risk, 25.4% had moderate risk and 38.1% had low risk for developing diabetic foot.

A cross sectional study was conducted by Mohammed SI, Mikhael EM, Ahmed FT, Al-Tukmagi HF, Jasim AL on risk factors for occurrence and recurrence of diabetic foot ulcer among 75 type 2 Diabetes Mellitus patients in Baghdad teaching hospital, Iraq. This study has shows that male Diabetes Mellitus patient were more prone to develop diabetes foot and older patients between 61-70 years with long history of Diabetes had high chance for diabetic foot among Iraqi patients. [3] This study supports the present study were 59 % sample were males and 30.9% were of age 61-70 years

A cross sectional study was conducted on prevalence and factors influencing diabetic foot ulcer among 260

Diabetic patients attending Arba Minch hospital, South Ethiopia. The study shows 59.7 % were males and were married corresponding to educational status of secondary education. Callus of foot make Diabetes Mellitus patients 18.6 % times have more likely to have diabetic foot ulcer compared to diabetic patient without callus on the foot. Diabetic patient with loss of sensation were 3.91 times more likely to have diabetic foot ulcer as compared to those without sensory loss. [4] These finding support the current study. In this study among 110 samples, 36.3% had high risk, 25.4% had moderate risk and 38.1% had low risk for developing diabetic foot. The one criterion for high risk assessment was presence of callus and loss of sensation.

### Practice of foot care in Diabetes Mellitus patient

In this study among 110 samples, 56 patients had bad practice, 20 patients had very good practice and 16 patients had very bad practice.

This finding of the study was supported by a study published in international journal of collaborative research of internal medicine and public health in Srilanka. It indicated that more than 50% of study sample had knowledge on diabetic foot care but practice is substandard. Among all diabetic foot care principle, only regular foot observations were carried out by 65.5% of samples. The practices of other foot care principle were below 50%. [5]

Another study conducted in department of Endocrinology and Diabetology Ethiopia among 85 patients



also supported the result. It showed that 50.9% patient had bad practice and only 18.18% patient had good practice. [6]

Another study conducted on Diabetic foot: prevalence knowledge and foot care practice in Tanzania among 104 patients showed that foot self-care practices were not performed by many patients even in the group at high risk for developing foot ulcers. This study also supports the present study. [7] This is relevant to present study finding in which patients with high risk had bad or very bad practice in preventing diabetic foot.

### **Barriers of foot care in Diabetes Mellitus Patients**

In this study majority of patients reported their main barrier that they were unaware of importance of foot care and have never received adequate education regarding how to care foot appropriately. A study conducted in Saudi Arabia supports the current study; shows that more than half of the patients never get adequate advice and were illiterate about importance of foot care. 40% didn't know about how to care their foot in order to prevent diabetic foot. 18% never received any adequate education regarding foot care practices.

A cross sectional study conducted in 2011 by Dikeukwu, Robert A, in department of Diabetology, Dr. Yusuf Dadoo Hospital, South Africa among 132 patients. The result of the study showed that greater proportion of diabetic patient had poor knowledge of diabetic foot care. The lack of knowledge of foot care as a barrier is consistent with findings by this study. [8]

### **CONCLUSION**

The study concludes that there is an urgent need to establish coordinated foot care services within the diabetic clinic to identify feet at risk, institute early management and provide continuous foot care education to patients by health care providers.

This study has highlighted the gaps in the practices and duration of Diabetes Mellitus. Client with long duration have far

better practices than client with short duration, which emphasize that longer duration of the condition have improved their awareness to prevent complications. If proper awareness is given during each follow up, the practice will be at peak level.

The findings from this study also provide insight on broad barriers to diabetic foot care within a developing country setting. As most of the patients are unaware of the importance of diabetic foot risk factors and its importance, awareness programs should be mandatory in all hospitals and diabetes clinics.

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