



A STUDY TO ASSESS THE KNOWLEDGE REGARDING DIABETIC FOOT ULCERS AMONG DIABETES MELLITUS PATIENTS AND THEIR CAREGIVERS AT A SECONDARY CARE HOSPITAL IN NORTHEAST INDIA.

Nursing

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ABSTRACT

Context: The global burden of Diabetic Foot Ulcers is substantial, with an estimated 40–60 million people affected worldwide — a sharp increase from earlier estimates of 9–26 million in 20154. Diabetic Foot Ulcers not only increase healthcare costs but also severely impair patients' quality of life by limiting mobility, productivity, and social participation5. Despite the preventable nature of many Diabetic Foot Ulcers, inadequate patient and caregiver knowledge remains a major barrier to effective prevention6. **Aim:** Assess the knowledge regarding Diabetic Foot Ulcers among Diabetes Mellitus patients and their caregivers and to determine the association between the level of knowledge of the patient with selected demographic variables. **Settings and Design:** This descriptive research study was undertaken among 120 Diabetes Mellitus patients and their caregivers attending secondary care hospital. Sample purposively. **Methods and Materials:** Data was collected using self-developed pre-validated and pre-tested subject data sheet and structured knowledge questionnaire. Structured knowledge questionnaire for assessing knowledge regarding Diabetic Foot Ulcers was distributed among the Diabetes Mellitus patients and their caregivers and their response were collected after 15 to 20 minutes. **Result:** 31.68% Diabetes Mellitus patients and their caregivers had excellent knowledge, 44.16% Diabetes Mellitus patients and their caregivers had good knowledge and 24.16% Diabetes Mellitus patients and their caregivers had poor knowledge. Thus, it implies that majority (44.16%) of Diabetes Mellitus patients and their caregivers had good knowledge about Diabetic Foot Ulcers. No association was found between knowledge regarding Diabetic Foot Ulcers with the selected demographic variables i.e., age, gender, religion, occupation, marital status and monthly income. However, there was significant association between education and year of diagnosis with the level of knowledge at p value <0.05. **Statistical Analysis used:** Data was analysed using STATA version 18. Descriptive statistics i.e., frequency, percentage, mean, median and standard deviation and inferential statistics i.e., chi square test were used to study the association of the knowledge of Diabetes Mellitus patients and their caregivers with the selected demographic variables. **Conclusion:** Majority of the Diabetes Mellitus patients and their caregivers had good to excellent knowledge but notable percentage of Diabetes Mellitus patients and their caregivers also had poor knowledge regarding Diabetic Foot Ulcer. However with education and year of diagnosis being the only statistically significant association. This highlights the need for targeted foot care education for newly diagnosed and less educated Diabetes Mellitus patients and their caregivers to prevent complications.

KEYWORDS

Caregivers, Diabetic Foot Ulcer, Diabetes Mellitus, knowledge, secondary care hospital

INTRODUCTION

Diabetes Mellitus is not a single disease but it is a group of metabolic disorders affecting a huge number of populations in the world. It is mainly characterized by chronic hyperglycemia, resulting from defects in insulin secretion or insulin action. It is predicted that the number of diabetes person in the world could reach up to 366 millions by the year 20301. Among various types of complications, diabetic foot complications represent one of the most serious and disabling outcomes of the disease. Studies indicate that 85% of diabetes-related lower limb amputations are preceded by a foot ulcer, and the amputation rate is 15 times higher in individuals with diabetes compared to those without the disease3. The global burden of Diabetes Foot Ulcers is substantial, with an estimated 40–60 million people affected worldwide — a sharp increase from earlier estimates of 9–26 million in 20154. The International Diabetes Federation reports a

global Diabetes Foot Ulcers prevalence of 6.3% among adults with diabetes, with higher rates observed in Africa and South American4. In India, Diabetic foot Ulcers DFUs affect 15% of diabetics during their lifetime7. In the North-eastern region of Assam 17.7% of diabetic patients had foot ulcers, and awareness of self-foot care was low (22.5%)8. In the state of Manipur, according to 2022 study by Jawaharlal Nehru Institute of Medical Sciences (JNIMS) Manipur recorded the overall prevalence of Type 2 Diabetes (T2D) among the Meitei population was 12.96%, due to which Manipur is experiencing a growing Diabetes Foot Ulcers burden9. Despite the preventable nature of many Diabetes Foot Ulcers, inadequate patient and caregiver knowledge remains a major barrier to effective prevention. Understanding the current level of awareness among diabetic patients and their caregivers is therefore crucial for designing targeted educational interventions6. This study aims to address this gap by

assessing the knowledge regarding Diabetic Foot Ulcers among Diabetes Mellitus patients and their caregivers

SUBJECTS AND METHODS:

Setting

Institutional Ethics committee approval was obtained for the study. Permission was obtained from the Medical Superintendent of the Secondary care hospital. Enrolled 120 diabetes mellitus patients and their caregivers.

Design:

Quantitative, non-experimental approach. Descriptive re-search design and purposive sampling was done.

Study measures:

A Structured knowledge questionnaire were used.

A Structured knowledge questionnaire (20 MCQs) developed after an extensive literature review to assess the knowledge of patients and caregivers regarding Diabetic Foot Ulcers. Each multiple-choice question carries one mark for every correct option. Maximum score was 20. Content validity of tool was obtained from the experts. Cronbach's alpha = 0.85

Data collection:

After obtaining institutional ethics approval and from the Medical Superintendent of the Secondary Care Hospital, 120 subjects meeting the inclusion criteria were enrolled in the study. Participant information sheet was distributed. A written informed consent was taken from the participants. Demographic variables were collected using the proforma. Structured knowledge questionnaire for assessing knowledge regarding Diabetic Foot Ulcers was distributed among the participants. Approximately 10-15 minutes were taken to complete the questionnaire.

Data Analysis:

Data was analysed using STATA version 18. Descriptive statistics i.e., frequency, percentage, mean, median, standard deviation and inferential statistics i.e., chi square test were used to study the association of the knowledge of Diabetes Mellitus patients and their caregivers with the selected demographic variables.

RESULTS:

Demographic profile and other selected variables of the Diabetes Mellitus patients and their caregivers.

Table-1 shows the frequency and percentage distribution of samples according to their age, gender, religion, education, occupation, marital status, monthly income and year of diagnosis. The mean age of the participants is 30±42.50. Majority (77.50%) were above the age of 45 years and majority (52.50%) were female. With respect to religion, majority (85.83%) were Christian and majority (40%) received primary education. Majority (46.67%) were unemployed and majority (74.17%) were married. With respect to their monthly income majority (41.67%) income were Rs50,000. Mean and standard deviation of year of diagnosed is 30±12.06, majority (39.17%) were diagnosed in between 1-5 years.

Assessment of the knowledge regarding Diabetic foot ulcers among Diabetes Mellitus patients and their caregivers

Table 2 shows the participants had an average knowledge score of 63.92± 19.41, with scores ranging from 4 to 20, showing a wide variation in the overall knowledge levels.

Table 3 shows the distribution of participants based on their knowledge levels. Nearly one-third (31.68%) demonstrated excellent knowledge, while majority (44.16%) showed good knowledge. The remaining 24.16% of participants had poor knowledge.

Assessment of the knowledge regarding Diabetic foot ulcers among Diabetes Mellitus patients and their caregivers with the selected variables

Table 4,5,6,8,9 & 10 reveals that none of the selected variables has any statistically significant association with the knowledge scores regarding Diabetic Foot Ulcer among Diabetes Mellitus patients and their caregivers

Table 7 shows that there is a statistically significant association between education level and the level of knowledge regarding Diabetic Foot Ulcers among Diabetes Mellitus patients and their caregivers

Table 11 shows that there is a statistically significant association between year of diagnosis and the level of knowledge regarding Diabetic Foot Ulcers among Diabetes Mellitus patients and their caregivers

DISCUSSION

In the present study majority (44.16%) subjects had good knowledge regarding Diabetic Foot Ulcers. Lawrence et.al reported 473 diabetic patients 63% had good knowledge of diabetic foot care but only 49% practiced it effectively i.e., practical application was inadequate²⁰ but here the authors used different methodology.

In the present study that there is no association between the demographic variables and knowledge score except with education and the year of diagnosis at p value < 0.05 level of significance. MA Alamil Mohammed, NAI Rahman reported that there was association between bad knowledge, attitude and practice about foot care and Diabetes Foot Ulcers at P. values: 0.03, 0.000 and 0.036 respectively. Thus the level of knowledge is associated with the education of the subjects²⁸

Aishwarya et.al reported most individuals with diabetic foot disease (DFD) had diabetes for over 10 years (55.5%)²⁹. However, the questionnaire in this study is different.

The researchers hypothesized that there will be a significant association of knowledge with the selected demographic variables i.e., age, gender, religion, education, occupation, marital status, monthly income and year of diagnosis regarding Diabetic Foot Ulcers among Diabetes Mellitus patients and their caregivers. The present study reveals that there is no association between the demographic variables and knowledge score except with education and the year of diagnosis at p value < 0.05 level of significance.

Not all studies are comparable because the methodology used is different especially the study tools.

The strength of the study is that it is the only study to assess the level of knowledge regarding Diabetic Foot Ulcers among Diabetes Mellitus patients and their caregivers in Secondary care Hospital of Northeast India and a proper structured teaching programme will help the Diabetes Mellitus patient and their caregivers to prevent the complications of Diabetic Foot Ulcers by taking proper preventive measures, proper treatment, maintaining proper balanced and regular follow-up. However as there was no negative marking there are chances of guessing to attend questions in knowledge questionnaire. Purposive sampling was used in the selection of participants.

However, Data will be more robust if study can be replicated with a large sample size and Structured educational programme can be used to impact knowledge regarding Diabetic Foot Ulcers among Diabetes Mellitus patients and their caregiver.

In conclusion this study shows that majority of the Diabetes Mellitus patients and their caregivers had good to excellent knowledge but notable percentage of Diabetes Mellitus patients and their caregivers also had poor knowledge regarding Diabetic Foot Ulcers. However with education and year of diagnosis being the only statistically significant association. This highlights the need for targeted foot care education for newly diagnosed and less educated Diabetes Mellitus patients and their caregivers to prevent complications.

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Table 1: Mean And Frequency Distribution of Selected Demographic Variables of The Diabetes Mellitus Patients And Their Caregivers (n=120)

Variables	Mean±SD	Frequency (%)
Age	18-35 years	30±42.50
	36-45 years	12(10%)
	>45 years	15(12.50%)
		93(77.50%)
Gender	Male	57(47.50%)
	Female	63(52.50%)
Religion	Christian	103(85.83%)
	Hindu	17(14.17%)
	Muslim	0(0.0%)
	Others	0(0.0%)

Education	No formal Edu.	41(34.16%)
	Primary	48(40%)
	Graduate	26(21.67%)
	Post-graduate	5(4.17%)
Occupation	Unemployed	56(46.67%)
	Self-employed	37(30.83%)
	Private employee	11(9.17%)
	Govt. employee	16(13.33%)
Marital Status	Single	14(11.66%)
	Married	89(74.17%)
	Widowed	17(14.17%)
	Divorced	0(0.0%)
Monthly Income	<Rs.10,000	50(41.67%)
	Rs 10k – Rs 30k	41(34.16%)
	Rs 30k – Rs50k	14(11.67%)
	>Rs 50,000	15(12.50%)
Year of diagnosis	Mean $\pm$ SD	30 $\pm$ 12.06
	<1 year ago	19(15.83%)
	1-5 years ago	47(39.17%)
	6-10 years ago	29(24.17%)
	>10 years ago	25(20.83%)

Table 2: Mean Knowledge Score Of The Diabetes Mellitus Patients And Their Caregivers (n=120)

Variable	Mean score($\pm$ SD)	Min score	Max score	Range
Knowledge score	63.92 $\pm$ 19.41	4	20	16

Table-3: Percentage, Mean And Standard Deviation of The Diabetes Mellitus Patients And Their Caregivers (n=120)

Score range	No. of subjects	Percentage (%)	Mean	SD
Excellent	38	31.68%	87.24	8.67
Good	53	44.16%	61.42	5.29
Poor	29	24.16%	38.79	7.48

Table 4: Association Between The Level of Knowledge Score Regarding Diabetic Foot Ulcers Among Diabetes Mellitus Patients And Their Caregivers With Age. (n=120)

Age	Knowledge level			Chi-square value(X^2)
	Excellent	Good	Poor	
18-35years	2(25%)	3(37.5%)	3(37.5%)	$X^2=1.5383$
36-45years	4(25%)	7(43.75%)	5(31.25%)	
>45years	30(31.25%)	45(46.875%)	21(21.875%)	

P value<0.05 is significant Df=6, tabulated value= 12.592 NS (Not Significant)

Chi square test *p<0.05

Table 5: Association Between The Level of Knowledge Score Regarding Diabetic Foot Ulcers Among Diabetes Mellitus Patients And Their Caregivers With Gender. (n=120)

Gender	Knowledge level			Chi-square value(X^2)
	Excellent	Good	Poor	
Male	21(36.84%)	22(38.60%)	14(24.56)	$X^2=2.264$
Female	16(25.40%)	32(50.79%)	15(23.81%)	
Others	0(0%)	0(0%)	0(0%)	

P value <0.05 is significant Df=4, tabulated value=9.488 NS (Not Significant)

Chi square test *p<0.05

Table 6: Association Between The Level of Knowledge Score Regarding Diabetic Foot Ulcers Among Diabetes Mellitus Patients And Their Caregivers With Religion (n=120)

Religion	Knowledge level			Chi-square value(X^2)
	Excellent	Good	Poor	
Christian	33(32.04%)	48(46.60%)	22(21.36%)	$X^2=3.485$
Hindu	3(17.64%)	7(41.18%)	7(41.18%)	
Muslim	0(0%)	0(0%)	0(0%)	
Others	0(0%)	0(0%)	0(0%)	

P value <0.05 is significant. Df=4, tabulated value=9.488 NS (Not Significant)

Chi square test *p<0.05

Table 7: Association Between The Level of Knowledge Score Regarding Diabetic Foot Ulcers Among Diabetes Mellitus Patients And Their Caregivers With Education (n=120)

Education	Knowledge level			Chi-square value (X^2)
	Excellent	Good	Poor	

No formal education	9(22.50%)	19(47.50%)	12(30%)	$X^2=25.874$
Primary	15(31.25%)	23(47.92%)	10(20.83%)	
Graduate	11(40.74%)	9(33.33%)	7(25.93%)	
Post graduate	1(20%)	4(80%)	0(0%)	

P value<0.05 is significant. Df=6, tabulated value=12.592, S (Significant)

Chi square test *p<0.05

Table 8: Association Between The Level of Knowledge Score Regarding Diabetic Foot Ulcers Among Diabetes Mellitus Patients And Their Caregivers With Occupation (n=120)

Occupation	Knowledge level			Chi-square value (X^2)
	Excellent	Good	Poor	
Unemployed	11(22%)	26(52%)	13(26%)	$X^2=7.356$
Self employed	18(42.85%)	17(40.48%)	7(16.67%)	
Private employee	2(20%)	5(50%)	3(30%)	
Govt. employee	7(38.89%)	5(27.78%)	6(33.33%)	

P value<0.05 is significant. Df=6, tabulated value=12.592 NS (Not Significant)

Chi square test *p<0.05

Table 9: Association Between The Level of Knowledge Score Regarding Diabetic Foot Ulcers Among Diabetes Mellitus Patients And Their Caregivers With Marital Status (n=120)

Marital status	Knowledge level			Chi-square value(X^2)
	Excellent	Good	Poor	
Single	1(9.09%)	5(45.45%)	5(45.45%)	$X^2=4.648$
Married	31(34.07%)	41(45.05%)	19(20.88%)	
Widowed	6(33.33%)	7(38.89%)	5(27.78%)	
Divorced	0(0%)	0(0%)	0(0%)	

P value <0.05 is significant. Df=6, tabulated value= 12.592 NS (Not Significant)

Chi square test *p<0.05

Table 10: Association Between the Level of Knowledge Score Regarding Diabetic Foot Ulcers Among Diabetes Mellitus Patients And Their Caregivers With Monthly Income (n=120)

Monthly income	Knowledge level			Chi-square value (X^2)
	Excellent	Good	Poor	
<Rs.10,000	11(22.45%)	25(51.02%)	13(26.53%)	$X^2=6.664$
Rs.10k-Rs30k	18(43.90%)	16(39.02%)	7(17.08%)	
Rs.30k-Rs50k	5(35.71%)	6(42.86%)	3(21.43%)	
>Rs.50,000	4(25%)	6(37.50%)	6(37.50%)	

P value<0.05 is significant Df=6, tabulated value=12.592 NS (Not Significant)

Chi square test *p<0.05

Table 11: Association Between The Level of Knowledge Score Regarding Diabetic Foot Ulcers Among Diabetes Mellitus Patients And Their Caregivers With Year Of Diagnosis (n=120)

Year of diagnosis	Knowledge level			Chi-square value (X^2)
	Excellent	Good	Poor	
<1 year ago	5(26.32%)	9(47.36%)	5(26.32%)	$X^2=16.589$
1-5 years ago	17(34%)	24(48%)	9(18%)	
6-10 years ago	2(7.69%)	13(50%)	11(42.31%)	
>10 year ago	14(56%)	7(28%)	4(16%)	

P value<0.05 is significant. Df=6, tabulated value=12.592 S (Significant)

Chi square test *p<0.05

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