

# DIABETIC FOOT CARE KNOWLEDGE AND ITS ASSOCIATED FACTORS AMONG TYPE 2 DIABETES PATIENTS

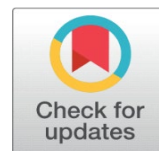


Gomathi A <sup>\*1</sup>✉ , Kamalam. S <sup>2</sup>✉, Jeevaanand. N <sup>3</sup>✉

<sup>1</sup> Associate Professor, College of Nursing, AIIMS, Jodhpur, India

<sup>2</sup> Professor cum Principal, AG Padmavathi College of Nursing, Puducherry, India

<sup>3</sup> Medical Officer (Ayurveda) Primary Health Centre, Ariyur, Puducherry, India



## ABSTRACT

**Background:** Diabetes is traditionally known as a “silent disease,” exhibiting no symptoms until it progresses to severe target organ damage.

**Aims & Objective:** The study was conducted to determine the knowledge of foot care, knowledge regarding foot care practice and its associated factors among type 2 diabetes patients.

**Material and Methods:** A Community based cross-sectional study was conducted at a primary health centre, Pondicherry, 107 subjects were selected by convenience sampling technique. Data was collected from December 2020 to March 2021, among type 2 diabetes who attended the diabetic clinic. A validated pretested questionnaire was used to assess the knowledge of foot care, knowledge regarding foot care practice and its associated factors among type 2 diabetes patients. Data was analysed using SPSS 21.

**Results:** Among 107 diabetes patients 70.1% of them had poor knowledge in foot care and 28% of them had poor Knowledge regarding practice of foot care. There was highly significant ( $p < 0.001$ ) relationship between knowledge of foot care and Knowledge regarding Practice of foot care. There was highly significant association ( $p < 0.05$ ) between the knowledge of foot care with selected demographic variables of gender, occupation, alcohol consumption, regularity of treatment and source of information.

**Conclusions:** It is a need of the hour to conduct health education programme to create awareness among rural people for better glycaemic control and prevention of ulcer foot in type 2 diabetes mellitus patients.

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### Corresponding Author

Gomathi A,  
[arumugamg@aiimsjodhpur.edu.in](mailto:arumugamg@aiimsjodhpur.edu.in)

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**Keywords:** Diabetes Mellitus, Knowledge, Practice, and Foot Care

## 1. INTRODUCTION

Type 2 Diabetes mellitus is a common form of Diabetes characterized by hyperglycemia, insulin resistance, and relative insulin deficiency. Interaction between genetic, environmental and behavioral risk factors, more vulnerable to complications, leading to their premature death. Insidious onset and late recognition, leads to increased morbidity and mortality especially in poor resource developing countries. Nicolucci A, Kovacs Burns K, Holt RIG, Comaschi M, Hermanns N, Ishii H, et al. 2013

Currently around 40.9 million is expected to rise to 69.9 million by 2025 unless urgent preventive steps are taken “more prone to premature coronary artery disease. India - “diabetes capital of the world”. Mohan.V, Sandeep.S, Deepa.R, Shah.B, Varghese.C. 2007



WHO estimated that diabetes will be one of the leading cause of death in the world by 2030? Mathers CD, Loncar D. 2006 Globally every year more than 1 million limbs are lost due to diabetes. WHO. 2016 The diabetic foot ulcer prevalence was 8-17% and leads to lifelong disability, repeated, prolonged hospitalization, financial crisis to the families and health care system. Stockl K, Vanderplas A, Tafesse E, Chang E. 2004 Half of the diabetic foot ulcer complications happens due to foot infection. Dang CN, Boulton A.J. 2003, Pinzur MS, Slovenkai MP, Trepman E, Shields NN, 2005

Out of pocket expenditure for the treatment of Non communicable disease has increased drastically in people belonging to lower socioeconomically class spend recently Sharma K. 2013. Prevalence estimates of diabetes in India ranges from 5.6% to 12.4% in urban areas and 2.4% to 2.7% in rural areas. Kurian.B, Qurieshi M.N, Ganesh.R, Leelamon.K. 2016 However there is a remarkable advancement available in the field of diabetology, the disease is doubling at alarming rate and it is having been observed that rural public has very little knowledge about diabetes. Sivapriya.T, John. 2019. Around 6% of people are affected by foot disease due to infection, ulceration and destruction of foot tissues, can destroy the patient's social life and source of income and 0.03% to 1.5% of diabetic patients needed amputation. But most of the foot related complications can be prevented by proper foot screening and foot care. Mishra SC, Chhatbar KC, Kashikar A, Mehndiratta A, 2021

With this view a community-based study was undertaken to assess the knowledge of foot care and knowledge regarding foot care practices among patients with diabetes mellitus.

## 2. SUBJECTS AND METHODS

### 2.1. STUDY DESIGN

A community based cross-sectional study was initiated to assess the knowledge of foot care and knowledge regarding foot care practice and its associated factors among type 2 diabetes patients, visiting the diabetic clinic at Rural Primary Health Centre Puducherry south India, from December 2020 to March 2021.

### 2.2. SAMPLE AND SAMPLING METHOD

Type 2 diabetes clients in the age group of 40-60 years were selected using the convenience sampling method for the study. Both sex were included in the study. Subjects who were non-cooperative, migrants, pregnant women, mental illness, or who were not willing to participate in the study were excluded. Based on the previous study, the expected proportion of people with knowledge regarding diabetic foot care practice was determined to be 62%. The minimum sample size for the study was calculated to be 94 using the following formula  $n = 4pq/d^2$  where p: expected proportion (0.62), Z<sub>1-p</sub>: alpha error 1.96 (confidence interval 95%), d: absolute precision (10%). Asmelash.D, Abdu.N, Tefer.S, Baynes.W.H, Derbew 2019 In this study 107 subjects included.

### **2.3. QUESTIONNAIRE**

In this study, the investigator used a self-developed validated pretested questionnaire to assess the knowledge of foot care, knowledge regarding foot care practice and its associated factors among type 2 diabetes patients.

The questionnaire had two parts. The first part included demographic information on gender, age, education, income and occupation, clinical variables of diabetes mellitus and the second part assessed the study participant's knowledge of foot care, and knowledge regarding foot care practice. The knowledge of foot care section included 20 questions regarding foot care. For correct response score 1 was given and the scores are further categorized as "Good knowledge" (Score range: 15-20,) "Fair knowledge" (Score range: 11 -14) and the "Poor knowledge" (Score range: 0-10). Knowledge regarding foot care practice included 12 questions towards their practice related to foot care and the response options were yes or no. The Scores range from 0-12, comprised three parts, categorized "Good practice" (Score range 10-12,) "Fair practice" (Score range: 6 -9) and the poor practice " (Score range: 0-5). The tool Validity index score was .8. Before conducting the main study, a pilot study was conducted to check the feasibility, ensure reliability and the validity of the tool for the study.

#### **Data collection procedure**

After explaining about the study and ensuring their confidentiality of the data. Data was collected from December 2020 to March 2021 through semi structured interview technique, guided by a validated pretested questionnaire.

### **2.4. ETHICAL APPROVAL OF RESEARCH**

The study was approved by the Institutional Ethics Committee of AG Padmavathi College of nursing Pondicherry, (Ref.no.AGP/IEC/2020/17X007). The participants (40-60 years) were informed about the study and given the verbal consent. The participation was voluntary and without compensation. The questions did not involve any personally identifiable information. All the information was kept confidential and used for the purpose of this study only.

### **2.5. ANALYTICAL METHODS**

The SPSS version 21 was used to analyse the data. The correlation was analysed by the Pearson correlation coefficient (Knowledge of foot care and knowledge regarding foot care practice) and to determine the association of knowledge with selected demographic variable was analysed by Chi-square test, P-value < 0.05 was considered statistically significant.

### 3. RESULTS

**Table 1 Distribution of Study Participants According to their Socio Demographic Characters**  
N=107

Variable	No	Percentage
<b>Gender</b>		
Male	38	35.5
Female	69	64.5
<b>Age</b>		
40-50 yrs	53	49.5
51-60 yrs	54	50.5
<b>Religion</b>		
Hindu	101	94.4
Muslim	5	4.7
Christian	1	.9
<b>Marriage</b>		
Married	105	98.1
Widow	2	1.9
<b>Education</b>		
Illiterate	32	29.9
Primary	11	10.3
Secondary	0	0
High school	48	44.9
Higher secondary	13	12.1
Graduates	3	2.8
<b>Occupation</b>		
House wife	52	48.6
Cooli	34	31.8
Skilled worker	8	7.5
Government job	1	.9
Private job	3	2.8
Business	6	5.6
Retired	3	2.8
<b>Income</b>		
No income	50	46.7
<2000	27	25.2
2000-5000	19	17.8
5000-10000	11	10.3
<b>Food habits</b>		
Vegetarian	106	99.1

Non vegetarian	1	.9
<b>History of Smoking</b>		
Yes	26	24.3
No	81	75.7
<b>History of Alcohol</b>		
Yes	26	24.3
No	81	75.7
<b>History of Tobacco</b>		
Yes	5	4.7
No	102	95.3

Table 1 shows that Out of the 107 subjects, 107 were considered eligible for analysis giving a response rate of 100%. Age wise distribution shows that 50.5% of them were >51-60 years of age. Majority of these diabetic patients belonged to Hindu religion 94.4%, 29.9% of them illiterate, 24.3% of them having the habits of smoking and alcohol consumption and 4.7 % of them having tobacco habits

<b>Table 2 Characteristics of patients with type 2 diabetes mellitus</b>		
<b>N=107</b>		
<b>Variable</b>	<b>No</b>	<b>Percentage</b>
<b>Regularity of Treatment</b>		
Yes	93	86.9
No	14	13.1
<b>Mode of treatment</b>		
Oral pills	107	100%
Insulin	0	0
<b>Family history of Diabetes</b>		
Yes	7	6.5
No	100	93.5
<b>Duration of disease</b>		
< 1 yr	6	5.6
1-3 yrs	49	45.8
>3-5 yrs	52	48.6
<b>Regular follow up</b>		
Yes	93	86.9
No	14	13.1
<b>Status of glycaemic control</b>		
Good	0	0
Fair	47	43.9
Poor	60	56.1
<b>Eye check up</b>		

Yes	8	7.5
No	99	92.5
<b>Renal check up</b>		
Yes	2	1.9
No	105	98.1
<b>Cardiovascular</b>		
Yes	19	17.8
No	88	82.2
<b>Source of information</b>		
Doctor	37	34.6
Nurses	40	37.4
Media	20	18.7
Relatives	10	9.3

Table 2 shows that out of 107 diabetes patients 86.9% of them in regular treatment, 6.5% of them has family history of diabetes mellitus, 48.6% of them has the history of duration of disease >3 to 5 years and 37.4% of them received source of information from nurses, 86.9% of them in regular follow up ,56.1% of them poor glycaemic control,92.5% of them did not undergo eye check-up ,91.8% of them not undergone renal and 82.2% of them not undergone cardiovascular check-up.

**Table 3 Level knowledge and knowledge regarding practice score towards foot care among diabetes patients. N=107**

Variable	Good	Fair	Poor
Knowledge of foot care	7(6.5%)	25(23.4%)	75(70.1%)
Knowledge regarding Practice of foot care	30(28%)	47(43.9 %)	30(28%)

Table 3 shows that Among 107 diabetes patients 70.1%of them had poor knowledge and 28% of them had poor Knowledge regarding practice of foot care.

**Table 4 Mean foot care knowledge and knowledge regarding practice score towards foot care among diabetes patients. N=107**

Variable	Mean ± SD
Knowledge of foot care	6.88 ± 4.39
Knowledge regarding Practice	6.87 ± 2.85
Total	13.75±7.24

Table 4 shows that the mean scores of knowledges and practice were 6.88±4.19, 6.87 ±2.85 respectively. The overall mean KP score was 13.75 ±7.29

**Table 5 Correlation (Pearson) between foot care Knowledge & Knowledge regarding Practice score towards foot care among Diabetic patients.**

Levels	r value	p value
Knowledge of foot care & Knowledge regarding Practice of foot care.	0.822	.000*

Statistically significant at \*\* p < 0.01

**Table 5** that there was highly significant (<0.001) relationship between foot care Knowledge & Knowledge regarding Practice score towards foot care

**Table 6 Association of level of knowledge with socio demographic variables  
N=107**

Socio demographic variables	Level of knowledge			df	X2	p-value
	Good	Fair	Poor			
<b>Gender 2</b>						
Male	3	13	22	2	4.383	0.031
Female	4	12	53			
<b>Education</b>						
Illiterate	0	9	23			
Primary	0	4	07	8	47.49	.005
Secondary	0	0	0			
High school	3	9	36			
Higher secondary	1	3	09			
Graduates	3	0	0			
<b>Occupation</b>						
House wife	2	12	38			
Cooli	1	6	27	12	36.34	0.000
Skilled worker	0	1	7			
Government job	0	1	0			
Private job	2	0	1			
Business	1	2	2			
Retired	1	3	0			
<b>Income</b>						
No income	2	10	38			
<2000	0	8	19	6	10.31	.013
2000-5000	3	6	10			
5000-10000	2	1	8			
<b>History of Smoking</b>						
Yes	3	15	12	2	10.26	.001

No	4	10	63			
<b>History of Alcohol</b>						
Yes	4	17	60	6	2.87	.036
No	3	8	15			
<b>Duration of disease</b>						
< 1 yr	1	0	5			
1-3 yrs	2	9	38	4	5.72	.041
>3-5 yrs	4	16	32			
<b>Regular check up</b>						
Yes	7	16	42			
No	0	09	33	2	5.343	.015
<b>Cardiovascular check-up</b>						
Yes	7	0	19	2	9.857	.001
No	0	25	56			

Table 6 shows that that the Association of knowledge with demographic variables revealed that there was highly significant association (<0.05) with gender, education, occupation, income, smoking alcohol consumption, duration of illness regularity of treatment and regular cardio vascular check-up.

#### 4. DISCUSSION

This study is intended to illustrate the knowledge and practices of the general public across the various demographic groups of rural people towards type 2 diabetes and identify the socioeconomic factors that affect them. It was observed in our study that 70.1% of them had poor knowledge, poor practice 28% towards diabetic foot care. These findings were supported by D.S.D et.al concluded in their study that 27% of them had poor knowledge and 35% of them had poor practice towards diabetic foot care [D S D., Vincent J., Saju C.R. 2020](#) and [Saurabh S, Sarkar S, Selvaraj K, Kar SS, Kumar SG, Roy G. 2014](#) who reported in their study that nearly 53% of them had good knowledge and 44,7 % of them had poor practices towards foot care. [Saurabh S, Sarkar S, Selvaraj K, Kar SS, Kumar SG, Roy G. 2014](#)

Another study conducted by Pitchai.P et.al concluded in their study that among rural population only 8% of them had good Knowledge and 48% of them had poor practices of diabetic foot care as compared to urban population that 58% of them had good Knowledge and 6% of them had poor practices. [Pitchai P, Joshi J. 2015](#)

In contrast a study conducted by George H et al have reported that 75% of participants had good knowledge and 67% of them had good practice towards diabetic foot care. [George H, Rakesh PS, Krishna M, Alex R, Abraham VJ, George K, et al](#) In this study the overall mean KP score was  $13.75 \pm 7.29$ . The results concur with those reported by Fatemah M et.al found that most Patients (79.3%) had good knowledge, and less than one third of patients (30.8%) practiced good Diabetic foot care, the mean knowledge score of the respondents was  $12.7 \pm 2.7$  and mean practice score was  $55.7 \pm 9.2$  and also concluded that knowledge regarding foot care was good and self-foot care practice was satisfactory. [F.M. Alsaleh, K.S. AlBassam, Z.K. Alsairafi et al](#). The result of current study revealed that the highly significant



(<0.001) relationship between knowledge and practice. These findings in disagreement with [Vighnesh CS, Rangaswamy S, Arthi M. 2019](#) who reported insignificant strong correlation between knowledge and practice of foot care ( $r = 0.79$ ). In this study knowledge got statistically significant association (<0.05) with significant association (<0.05) with gender, education, occupation, income, smoking alcohol consumption, duration of illness regularity of treatment and regular cardiovascular check-up. A study conducted by George H et.al reported education and socioeconomic status were significantly associated with knowledge of diabetic care. [George H, Rakesh PS, Krishna M, Alex R, Abraham VJ, George K, et al.](#)

In this study Age wise distribution shows that 50.5 %of them were >51-60 years of age. Majority of these diabetic patients belonged to Hindu religion 94.4%, 98.1% of them married, 29.9% of them illiterate, 24.3% of them having the habits of smoking and alcohol consumption and 4.7 % of them having tobacco habits. The findings were similar to the study conducted [Shrivastava PS et.al Shrivastava PS, Shrivastava SR, Ramasamy J \(2015\)](#)

Out of 107 diabetes patients 86.9% of them in regular treatment, 6.5% of them has family history of diabetes mellitus, 48.6% of them has the history of duration of disease >3 to 5 years and 37.4% of them received source of information from nurses, 86.9% of them in regular follow up ,56.1% of them poor glycaemic control,92.5% of them did not undergo eye check-up ,91.8% of them not undergone renal and 82.2% of them not undergone cardiovascular check-up.

## 5. CONCLUSION

The study revealed that the knowledge foot care and knowledge regarding foot care practices of diabetic patients were poor. It is an urgent need of the hour to conduct health educational programme to make awareness among rural people for better control and management of the disease.

### **Availability of data and materials**

All data generated during this study are included in the article. Raw data would remain confidential and would not be shared.

### **Ethical approval of research**

The study was approved by the Institutional Ethics Committee of AG Padmavathi College of nursing Pondicherry, (Ref.no.AGP/IEC/2020/17X008). The participants (40-60 years were informed about the study and given the verbal consent. The participation in survey was voluntary and without compensation. The survey questions did not involve any personally identifiable information. All the information was kept confidential and used for the purpose of this study only.

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