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"A study to explore the perceived barriers in foot care and to assess the foot care practice among diabetic patients undergoing treatment at a selected hospital in Karad with a view to conduct a demonstration program on footcare".

Tukaram B. Zagade[1], Mahesh B Chendake[2]
Professor[1] Krishna Instititute of Nursing Sciences, Krishna Institute of Medical Sciences Deemed To Be University Malkapur Karad, Dist- Satara (Maharastra) India.415539.
Associate Professor2 Krishna Instititute of Nursing Sciences, Krishna Institute of Medical Sciences Deemed To Be University Malkapur Karad, Dist- Satara (Maharastra) India.415539.

Abstract

Background : Diabetic foot problems are a major cause of morbidity and premature mortality in people with diabetes.

Objectives: The aim of the study was to explore the perceived barriers in foot care and to assess the foot care practice among diabetic patients undergoing treatment at a selected hospital in Karad with a view to conduct a demonstration program on foot care.

Methods: Research design adopted for the study was a descriptive exploratory survey. Purposive sampling technique was used to select 120 diabetic patients. Structured interview schedule was used to explore perceived barriers of foot care and foot care practice. Demonstration program on foot care was conducted for all patients.

Results: Majority (77.5%) of the diabetic patients were having poor practice regarding foot care and only 22.5% were having good practice. Subjects expressed many barriers which have interfered with their regular practice of foot care.

Conclusion: Majority of diabetic patients had poor foot care practice and the patients expressed many barriers that had an influence on their foot care practice. Findings stress the need for educational and motivational strategies for diabetic patients to comply with effective foot care.

Keywords: Diabetes mellitus, diabetic patients, diabetic foot ulcers.

Introduction

The paradigm shifting o disease burden from communicable to non communicable disease has brought in the need to implement integrated measures for management of non communicable diseases in India. Amongst several non communicable diseases, diabetes account for a major burden of disease mortality and morbidity, in-turn accounting for a major share of premature mortality[1].

Diabetes mellitus is a chronic debilitating condition characterized by an increased blood glucose level and caused by an imbalance between insulin supply and demand. It is associated with significant morbidity, mortality, and increasing health care costs. Diabetes has an alarming incidence and is increasing rapidly so that the diabetes prevalence has increased 50% during the past 10 years. Estimations in 2010 indicate that there are almost 285 million diabetic adults all over the world. It is expected that this number will continue to increase worldwide due to population aging, population growth, urbanization and high prevalence of obesity and sedentary lifestyle[2].

As per the WHO statistics of 2016, there are 422 million adults living globally with diabetes mellitus. 3.7 million People die every year due to diabetes. 15-25% of patients with diabetes mellitus

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are developing foot complications during their lifetime. The WHO also estimates that 80 per cent of diabetes deaths occur in low and middle- income countries and projects that such deaths will double

between 2016 and 2030. It has been further estimated that the global burden of type-2 diabetes is expected to increase to 478 million by 2030 from 285 million people recorded in 2010. For India this increase is estimated to be 58%, from 51 million people in 2010 to 87 million in 2030[3].

India is facing an epidemic of diabetes, with high prevalence in urban areas. Over the past 30 years, the prevalence of diabetes has increased to 12-18% in urban India and 3-6% in rural India. As per the latest statistics of 2016, 69.2 million people are suffering from diabetes in India and it is predicted to increase up to 109 million by 2035. It is also estimated that nearly 1 million deaths occur due to diabetes every year[3].

Indians develop diabetes at a younger age and those younger than 45 years accounts for 36% of all diabetics in India. Longer duration of diabetes leads to greater complications and this could threaten the national economy[3].

Karnataka is currently undergoing epidemiological and socio-demographic transitions with increase in the prevalence of non communicable diseases. Karnataka is one of the top three states in having the highest prevalence of pre diabetic individuals. With 7.5% prevalence of diabetes, the southern state stands at the sixth position in India[4].

Among the many complications associated with diabetes, issues related to foot disease represent a significant and often challenging clinical problem. Diabetic foot ulcers and lower extremity amputations are a common, complex, costly, and disabling complication of diabetes. An estimated 15% of patients with diabetes develop a lower extremity ulcer. It is estimated that about 5% of all patients with diabetes present with a history of foot ulceration, while the lifetime risk of diabetic patients developing this complication is 15%. The majority (60–80%) of foot ulcers will heal, while 10–15% of them will remain active, and 5–24% of them will finally lead to limb amputation within a period of 6–18 months after the first evaluation[5].

Among the complications of diabetes, lower limb amputation is considered to be potentially preventable. Lower limb amputations in patients with diabetes are preceded by foot ulcers. Studies have revealed that barefoot walking, inappropriate footwear, poor foot hygiene and delay in seeking medical attention are the risk factors for the development of foot ulcers. These non-traditional risk factors can be modifiedif identified early, and if patients have adequate knowledge of foot care[6].

Successful treatment of infection in the feet of patients with diabetes mellitus remains a challenge. The development of a foot ulcer invariably involves the convergence of several pathological mechanisms. Diabetic peripheral sensory motor
neuropathy is a key factor in the majority of cases. As a result of damage to sensory nerves, minor trauma can go unnoticed[7].

Neuropathy can also deform the architecture of the foot to such a degree that joints and digits are placed in mechanically unfavorable positions, making them highly vulnerable to injury. Once the skin has been breached, continued mobilization on a broken area impairs the healing process. Inevitably, direct contiguous spread of microbes on the skin follows on, with colonization and infection of superficial and then deeper tissues likely if the process is allowed to proceed unchecked. Both the healing process and the response to infection are further compromised by vascular insufficiency, which is commonly present in patients burdened with complications of diabetes[7].

In India, the prevalence of diabetic foot ulcers in the clinic population is 3.6%. Socio-cultural practices such as barefoot walking, religious practices like walking on fire, use of improper footwear and lack of knowledge regarding foot-care attributes towards the increase in the prevalence of foot

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complications. Studies have shown that hyperglycemia control, cessation of smoking, proper foot hygiene, daily inspection of feet for any trauma, use of proper footwear and early medical help can prevent the incidence of foot ulcers by 50-60%[8].

Multidisciplinary management programs that focus on prevention, education, regular foot examinations, aggressive intervention, and optimal use of therapeutic footwear have demonstrated

significant reductions in the incidence of lower-extremity amputations[9].

Interventions to reduce the burden of diabetic foot ulceration and amputationare estimated to be highly cost-effective, indeed cost saving, in both developed and developing country settings. The challenge, particularly in less well-resourced health care systems, is how to implement effective foot care that realizes these potentialhealth gains and cost savings[10].

Need For The Study

Diabetes mellitus is a chronic metabolic multifactorial disorder associated with altered glucose homeostasis as well as macro and micro vascular complications

The development of diabetic foot ulcers results from several factors. These factors can increase the risk of foot ulcer and cause detachment in the skin or impairment in the wound healing. Peripheral neuropathy can cause excessive pressure on some points of the feet and consequently, ischemia can increase the susceptibilityto ulceration by impairment in peripheral vascular system. In addition, other factors such as poor vision, limited joint movement, inadequate foot coverage and shoes can increase the susceptibility to cause ulceration in diabetics[14].

Neuropathy in diabetic patients is manifested in the motor, autonomic, and sensory components of the nervous system. Damage to the innervations of the intrinsic foot muscles leads to an imbalance between flexion and extension of the affected foot. This produces anatomic foot deformities that create abnormal bony prominences and pressure points, which gradually cause skin breakdown and ulceration[14].

Autonomic neuropathy leads to a diminution in sweat and oil gland functionality. As a result, the foot loses its natural ability to moisturize the overlying skin and becomes dry and increasingly susceptible to tears and the subsequent development of infection[14].

The loss of sensation as a part of peripheral neuropathy exacerbates the development of ulcerations. As trauma occurs at the affected site, patients are often unable to detect the insult to their lower extremities. As a result, many wounds go unnoticed and progressively worsen as the affected area is continuously subjected to repetitive pressure and shear forces from ambulation and weight bearing[15].

Diabetic foot has great burden on the health system also, as it is the commonest reason for hospitalization of diabetic patients (about 30% of admissions) and absorbs some 20% of the total health-care costs of the disease more than all other diabetic complications. Especially in a developing country, like India, treating diabetic foot may account for 40 percent of health resources. Limb amputation itself is associated with many socioeconomic consequences for patients like, loss of productive hours at inpatient department, permanent loss of income, decreased social acceptance etc[16].

Diabetic foot ulcers has a complex pathogenesis, variable clinical presentation, thus the management requires early expert investigations. Interventions should be directed at treating secondary infections; peripheral ischemia and abnormal pressure loading caused by peripheral

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neuropathy and limited joint mobility. Despite treatment, ulcers readily become chronic wounds. Diabetic foot ulcers have been neglected in health-care research and planning, and clinical practice is based more on opinions than scientific facts. Furthermore, the pathological processes associated with diabetic foot ulcers are poorly understood, inadequately taught and communicated between the many clinical specialties involved[17].

In addition to causing suffering and morbidity, foot lesions in diabetic patients have substantial economic consequences. Diabetic foot complications result in huge costs for both society and the

individual patients. The economic burden of diabetic foot ulcers and the complications arising from them are enormous. The high costs have been linked to frequent outpatient appointments, in-patient days, laboratory tests, drugs/medications, hospital stays, and secondary complications of osteomyelitis and amputation[17].

Early detection of potential risk factors for ulceration can decrease the frequency of wound development. Poor knowledge of foot care and poor foot care practices were also identified as important risk factors for foot problems in diabetes. Additional factors that may affect healing include smoking, alcohol abuse and depression or other mental illness, which can affect the treatment compliance[18].

It is recommended that all patients with diabetes undergo foot examinations at least annually to determine predisposing conditions to ulceration. Patients should be educated regarding the importance of maintaining good glycemic control, wearing appropriate footwear, avoiding trauma, and performing frequent self-examinations[19].

Regular evaluation and early treatment are the most effective mechanisms to prevent the devastating diabetic foot complications. Unfortunately, the majority of patients admitted to the hospital for diabetic foot complications receive a less than adequate lower extremity evaluation. Though there is an obvious increase in diabetic foot care awareness, there are tremendous gaps in routine foot evaluations[20].

Management of diabetes is complex for patients and providers and requires good patient–provider communication skills. Recent research studies have reported that many individual, educational, and system barriers have limited the diabetes patients' self management practices. Studies have reported that several social and cultural practices such as barefoot walking, inadequate facilities for diabetes care and education and poor socioeconomic conditions as the barriers for foot care practices of diabetic patients[21].

Potential barriers to foot care are grouped into three categories such as availability of health care, patient related factors and health care system related factors. Lack of adequate clinical facilities, and distance from health care system, delay in seeking medical attention, bare foot walking, inappropriate foot wear, and poor foot hygiene were expressed by many patients as the barriers to effective foot care. Healthcare system related factors include attitude of healthcare professionals and poor communication between patient and healthcare personnel. Lack of understanding of diabetes and its possible complications has been expressed as the major barrier to effective foot care by majority of diabetic patients[22].

A study conducted to assess the prevalence, knowledge and foot self care practices among diabetic patients has revealed that the foot care practices of diabetic patients was very poor and has

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strongly recommended for educational strategies to improve patients knowledge of risk and foot care practices[23].

Although there is a large amount of literature on diabetic foot and the importance of foot care, there are limited published data on the barriers to foot care among diabetic patients. Also researcher observed that there is a wide gap between the knowledge and foot care practices of diabetic patients. Timely recognition of barriers will help to plan cost effective strategies by health care professionals to overcome the obstacles and to facilitate provision of care to diabetic patients.

During researcher's clinical experience with diabetic patients, it was observed that majority of diabetic patients are developing foot complications. Exploration ofthe perceived barriers in foot care and the foot care practices will help the health care professionals to plan and implement appropriate teaching strategies for diabetic patients which in turn will reduce their risk of

developing foot problems. Realization of this responsibility motivated the researcher to conduct a study to explore the perceived barriers in foot care and foot care practices of diabetic patients.

Statement of The Problem

"A study to explore the perceived barriers in foot care and to assess the foot care practice among diabetic patients undergoing treatment at a selected hospital in Karad with a view to conduct a demonstration program on footcare".

Objectives

1. To explore the perceived barriers of foot care among diabetic patients.
2. To assess the foot care practice among diabetic patients.
3. To determine the association between foot care practice and the selected personal variables of diabetic patients.
4. To conduct a demonstration programme on foot care among diabetic patients.

Assumptions

1. Personal and demographic factors of diabetic patients may influence their foot care practices.
2. Exploration of barriers in foot care among diabetic patients may help the health care professionals to plan appropriate teaching strategies.

Delimitations

The study is delimited to the type 2 diabetic patients undergoing treatment at selected hospital in Karad. Methodology

The present study was aimed to explore the perceived barriers in foot care and to assess the foot care practice among diabetic patients in a selected hospital in Mysuru with a view to conduct a demonstration program on foot care.

Research Approach

Asthe aim of the study was to explore the perceived barriers in foot care and to assess the foot care practice among diabetic patients, an exploratory approach was adopted for this study.

Research Design

Research design of this study is descriptive exploratory survey.

Variables of The Study

Research variables:

- Perceived barriers of foot care among diabetic patients.
- Foot care practices among diabetic patients.
- Selected personal variables of diabetic patients viz. age, gender, religion, educational

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status, occupation, marital status, monthly family income, type of family, duration of illness, place of residence, distance of residence from health care institution and previous exposure to teaching program on foot care. Sources of Data

Setting

The setting for the present study was outpatient and inpatient Departments ofMedicine and Surgery of Krishna Hospital & Medical Research Centre , Karad.

Population:

Population is the entire aggregation of cases in which investigator is interested[26].

In the present study population refers to the Type 2 diabetes mellitus patients.

Sample and Sampling Technique

Sample is the subset of population[26]. In the present study, sample comprise of diabetic patients attending in-patient and out-patient departments of surgery and medicine at JSS hospital in Mysuru.

Sample Size

120 Type 2 diabetes mellitus patients attending inpatient and outpatient departments of surgery and medicine of selected hospital.

Sampling Technique

Sampling is the process of selecting a portion of the population to represent the

population[26]. Purposive sampling technique was used to select the 120 diabetic patientsfor

Sampling Criteria

Inclusion Criteria for Sampling:

Diabetic patients who are:

- Attending the outpatient and inpatient departments of Medicine and Surgery at selected Krishna Hospital & Medical Research Centre , Karad during the period of data collection.
- Diagnosed as having type 2 diabetes mellitus and with duration of illness ofminimum 3 months.
- Available during the period of data collection.

Exclusion Criteria for Sampling:

Diabetic patients who are:

- Diagnosed as having type 2 diabetes mellitus recently (less than 3 months).
- In a debilitated condition with co-morbid illnesses.
- Not willing to participate in the study.

Sampling Frame

Target population (Type 2 diabetes Patients)

↓

Accessible population

↓

(Type 2 diabetes Patients attending Outpatient and Inpatient departments ofMedicine and Surgery at Krishna Hospital & Medical Research Centre , Karad.)

↓

Purposive sampling

↓

Sample size (120)Data collection

Structured interview schedule

↓

Data analysis

Data Collection Technique

Instrument in a research study was the device used to collect data.

Based on the review of literature the following tools were developed by the investigator:

1. Personal proforma to assess the selected personal variables of diabetic patients.
2. Structured interview schedule to identify perceived barriers of foot care among diabetic patients.
3. Structured interview schedule to assess foot care practice among diabetic patients.
4. Demonstration program on foot care in Diabetes.

1. Description of selected personal variables of diabetic patients

This section includes the basic information about the diabetic patients viz. age in years, gender, religion, educational status, occupation, marital status, monthly family income, duration of illness, type of family, place of residence, distance of residence fromthe health care

Institution and previous exposure to teaching programs on foot care.

2. Description of structured interview schedule to identify perceived barriers of foot care among diabetic patients

A Structured interview schedule was developed by the investigator with the intention to identify the perceived barriers of foot care among diabetic patients. It was developed based on the review of research and non research literature about the foot care practice among diabetes patients.

Structured interview schedule consists of 20 statements related to the diabetic patients'

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perceived barriers in foot care. Each item in the structured interview schedule has two responses (Yes/No).

Perceived barriers of foot care among diabetic patients were categorized as:

a) Patient-related factors (13 items)

b) Health care system related factors (7 items).

Patient related factors were again categorized as lack of knowledge regarding foot care, problems related to advancing age, time constraints and work pattern, lack of financial support and religious/cultural practices of diabetic patients. Health care system related factors were related to the patients' opinion about the delivery of services related to foot care by the health care personnel.

3. Description of structured interview schedule to assess foot care practice among diabetic patients.

The structured interview schedule was developed by the investigator with the intention to assess foot care practice among diabetic patients. It consists of 17 statements. Each statement has 3 response columns (Daily/Always, often, never). All the positive statements were scored as 2, 1, 0 and negative statements scored as 0, 1, and 2.

The total score ranges from 0-34. The scale is classified arbitrarily as:

Good practice: 25-34 (above 75%)

Poor practice: 0-24

4. Demonstration program on foot care

It was developed based on the opinion of guide, experts and review of research and non-research literature on foot care practice among diabetes patients. Demonstration program on foot care includes definition and causes of diabetes, importance of daily foot care for diabetic patients, prevention of foot ulcers and basic steps of daily foot care in diabetes.

Content Validity

Content validity is the degree to which the items in the instrument adequately represent the universe of content for the concept being measured[26].

The Proforma for selected personal variables, structured interview schedule to identify perceived barriers of foot care and foot care practice of diabetic patients were content validated by giving tools to 9 experts (7 experts from Nursing, 1 Physician and 1 Surgeon). The experts were requested to give their opinion and suggestions regarding appropriateness and relevance of the items.

There was 100% agreement between all subject experts for all the items in the proforma for selected personal variables, structured interview schedule to identify perceived barriers of foot care and structured Interview schedule to assess foot are practice among diabetic patients.

There was 100% agreement between all subject experts for the content of demonstration program on foot care.

Data Collection Procedure

Formal administrative permission for conducting the study was obtained from the Medical Director and concerned Head of the Departments. Ethical clearance for conducting the study was obtained from the Institutional Ethical Clearance committee. After taking approval from the administrative authority, 120 diabetic patients admitted in the in-patient departments of medicine

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and surgery and patients attending the out-patient services of same departments were selected by using purposive sampling technique. In order to obtain a free and true response, the respondents were explained about the purpose and usefulness of the study and assurance about the confidentiality of their responses was also provided. An informed consent was obtained from each sample indicating their willingness to participate in the study.

Data was collected from 18-01-2018 to 16-02-2018. The researcher took all care to look in to the convenience and comfort of the subjects. Necessary precautions were taken to provide privacy, confidentiality and ethical issues of the patients. All the selected patients were met individually. Interview with the outpatients was conducted in a separate room in the outpatient department during the morning hours. Interview withthe inpatients was conducted in the evening hours from 3pm to 5pm as there was less interruption during this time related to ward routines and rounds. Each interview took 15-20 minutes. On an average 3-4 patients were interviewed each day.

Demonstration program was followed by structured interview schedule. For patients attending outpatient departments, demonstration program on foot care was conducted in a separate room adjacent to the outpatient departments of medicine and surgery. For inpatients, demonstration program was conducted in the demonstration roomof medicine and surgery wards.

Demonstration program was conducted for 3-4 patients/day. The researcher has demonstrated the daily inspection of feet and basic steps of foot care for all patients. Patients queries related to foot care were answered by researcher. A return demonstration about daily inspection of foot and the technique of foot care was taken from all subjects.

Demonstration program for each daily group of diabetic patients (3-4 patients) took 10 minutes for demonstration and 20 minutes for return demonstration. Data collection procedure was terminated after thanking each respondent for their participation and cooperation in the study.

Plan of Data Analysis

Descriptive statistics:

1. Frequency and percentage to analyze the selected personal variables of diabetic patients.
2. Frequencies, percentage, mean, median, range and standard deviation to analyze the perceived barriers and foot care practices of diabetic patients.

Inferential statistics:

1. Chi-square to compute the significance of association between the foot carepractice and selected personal variables of diabetic patients.

Results

Deals with the analysis and interpretation of the data collected to explore the perceived

barriers in foot care andto the assess foot care practice among diabetic patients.

Objectives

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Organization of Findings

The data was analyzed and interpreted using descriptive and inferential statistics. The findings are presented under the following headings.

Section 1

Description of selected personal variables of diabetic patients

The study sample consists of 120 patients attended the inpatient and outpatient departments of Krishna Hospital & Medical Research Centre , Karad.. The selected personal variables of diabetic patients were: age in years, gender, religion, educational status, occupation, marital status, monthly family income, duration of illness, type of family, place of residence, distance of residence from the health care Institution and previous exposure to teaching programs on foot care and are presented in the Table 1.

Age

The data presented in the Table 1 shows that 49.2% of diabetic patients were in the age group of > 45-60 years, 28.3% were above 60 years and 22.7% were belonging to age group of 30-45 years.

Gender

Data presented in the Table 1 shows that majority of diabetic patients (67.5%) were males and only 32.5% were females.

Religion

The data presented in the Table 1 shows that, majority (70.8%) of the diabetic patients were belonging to Hindu religion, 18.3% belongs to Christian religion and only 10.9% were belonging to Muslim religion.

Educational Status

The data presented in the Table 1 reveals that, majority of diabetic patients (29.1%) have completed PUC, 26.6% have completed Primary education, 23.3% have completed higher primary education, and only 21%

Occupation

The data presented in the Table 1 shows that, majority of the diabetic patients (57%) were doing agriculture, 43% were employee and others.

Marital Status

The data presented in the Table 1 shows that, all diabetic patients (100%) were married.

Monthly Family Income

The data presented in the Table 1 shows that, majority (33.3%) of the diabetic patients were having the monthly income up to Rs.5000, 26.7% were having the income of Rs.5001-10000, 23.3% were having income above Rs 15000, and only 16.7% were having the monthly income of 10001-15000 rupees.

Duration Of Illness

Data presented in the Table 1 shows that, majority (27.5%) of diabetic patients were having duration of illness of more than 10-15 years, 26.7% of patients were having duration of illness more than 15 years, 21.7% were having duration of illness of more than 5-10 years, 15%

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were having duration of illness more than 1-5 years and only 9% of patients were having duration of illness of 3 months to 1 year.

Type of Family

The data presented in the Table 1 shows that, majority of the diabetic patients (76%) were belonging to joint family and 24% were belonging to nuclear family.

Place of Residence

Data presented in the Table 1 shows that, majority (55.8%) of diabetic patients were from rural areas, 26.7% of diabetic patients were from urban areas and only 7.5% were from Semi-urban areas.

DISTANCE OF RESIDENCE FROM THE HEALTH CARE INSTITUTION (INKILOMETRES)

Data presented in the Table 1 and **fig.10** shows that, majority (66%) of diabetic patients were residing more than 10 km of distance from the health care institution and only 34% of diabetic patients were residing within 10 km of distance from the health care institution.

Previous Exposure To Teaching Program On Foot Care

Data presented in the Table 1 shows that, majority (85%) of the diabetic patients were not having previous exposure to teaching program on foot care and only 15% of the diabetic patients were having previous exposure to teaching program on foot care.

Description of perceived barriers of foot care among diabetic patients

Perceived barriers of foot care among diabetic patients were identified using structured interview schedule and the data were tabulated to a master sheet and frequency and percentage were computed. The findings are presented in Table 2.

TABLE 2

Frequency and Percentage distribution of perceived barriers of foot care among diabetic patients

n = 120

SI. No	Statements	Response	
		Yes (f) %	No (f) %
	a) Patient-related factors		
1	You are not aware of the importance of regular foot care to prevent foot complications	81 **(67.5)**	39 (32.5)
2	You not aware of the correct technique of foot care for diabetes mellitus	98 **(81.6)**	22 (18.4)
3	You are not aware of the importance of taking care of your feet by wearing correct size chapels always.	72 **(60.0)**	48 (40.0)
4	You are not able to detect the early manifestations of possible nerve damage due to diabetes	60 **(50)**	60 **(50)**

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5	You find it difficult to detect the foot problems due to numbness/lack of sensation in your feet	78 **(65)**	42 (35)
6	Your advancing age/visual problems inhibits you to perform regular care of your foot	60 **(50)**	60 **(50)**
7	You find it difficult to do foot exercise as you are sick frequently.	46 (38.3)	74 **(61.7)**
8	You are not getting enough time to take care of your foot daily	70 **(58)**	50 (42)
9	You find it difficult to visit your doctor regularly because of time constraints.	73 **(60.8)**	47 (39.2)
10	Your work pattern inhibits you from wearing recommended foot wears	77 **(64.2)**	43 (35.8)
11	You find it difficult to afford the recommended foot wear/creams for care of your feet	37 (30.8)	83 **(67.2)**
12	You find it difficult to ask financial support from your family members for the recommended care of your feet.	30 (25)	90 **(75)**
13	Your religious/cultural practices inhibits you from wearing chapels at home and outdoors	100 **(83)**	20 (17)
b) Health care system related factors			
14	You find it difficult to approach your doctor for minor foot problems	85 **(70.8)**	35 (29.2)
15	You are not getting information about foot care and complications from your health care personnel.	36 (30)	84 **(70)**
16	You find it difficult to follow instructions given by your health care personnel.	12 (10)	108 **(90)**
17	You avoid visit to health care centers because of longer queues for getting medical help.	88 **(73.3)**	32 (26.7)
18	You prefer your traditional way of	74 **(61.**	46 (38.3)

	healing in case of foot injuries/problems.	**7)**	
19	The staffs at your treatment centers are too busy to answer your questions related to foot care	52 (42. 683)	**(56.7)**
20	You find it difficult to visit your doctor frequently	46 (38. 743)	**(61.7)**

Perceived barriers of foot care among diabetic patients were categorized as:

a) Patient-related factors and b) Health care system related factors. Patient related factors consists of lack of knowledge regarding foot care, problems related to advancing age, time constraints, work pattern, lack of financial support and religious/cultural practices of diabetic patients.

a) Patient-related factors

i. Lack of knowledge regarding foot care

Majority of diabetic patients expressed that lack of adequate knowledge regarding the importance of foot care and the technique of foot care was a major barrier which has affected the daily care of their feet.

81.6% of diabetic patients agreed that they were not aware about correct technique of foot care practice. 67.5% of diabetic patients were not aware of the importance of regular foot care and 60% were not aware of the importance of wearing correct/appropriate size foot wear. 50% of patients expressed that were not able to detect early manifestations of nerve damage.

ii. Problems related to advancing age

Many diabetic patients expressed that advancing age and age related physical problems are hindering factors for their daily foot care practice.

Majority (65%) of diabetic patients agreed that it difficult to detect foot problems due to numbness/lack of sensation in their feet. 50% patients expressed that the advancing age and visual problems inhibit them to perform regular foot care examination. 38.3% of patients agreed that they are unable to do regular foot exercisesdue to frequent illnesses.

iii. Time Constraints

Majority (60%) of patients agreed that they are not able to visit their doctor regularly because of time constraints as they are engaged in agricultural fields
the time. (58%) of diabetic patients expressed that they are not getting enough time totake care of their feet daily.

iv. Work pattern

64.2% of patients agreed that, their work pattern inhibited them to wear recommended foot wear for diabetes. Majority of diabetic patients were doing agriculture and they were not able to wears the recommended foot wears in the fields.

v. Socio-economic factors

Majority (67%) of diabetic patients expressed that they are not able to afford the recommended foot wear due to their economic constraints.

vi. Religious and Cultural factors

83% of diabetic patients agreed that their cultural and religious factors inhibited them from wearing chapels always. Many patients expressed that they cannot wear chappals to temples, and the agricultural fields as they have the specific religious beliefs.

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b) Health care system related factors

Majority (73.3%) of patients expressed that they avoid regular visit to health care centers because of longer queues in the hospital.70.8% of diabetic patients agreed that they find it difficult to approach the doctor for minor foot problems. 61.7% of patients agreed that they prefer traditional way of healing for foot injuries and problems. Few patients (29.2%) expressed that they do not have the practice of going to doctor for minor foot problems and they prefer to apply home remedies such as applying turmeric powder over the wounds

42.3% of patients agreed that staffs in the treatment center are busy to answer their questions related to foot care and 30% of them agreed that they are not getting adequate information about foot care from their health care personnel. Only 10% of patients expressed that they find it difficult to follow the instructions from the health care personnel.

38.3% of diabetic patients expressed that they find it difficult to visit the doctor frequently as they stay away from treatment centre. Few patients expressed that inadequate transportation facilities from their villages inhibited them from visiting their doctors regularly.

SECTION: 3

Description of foot care practice of diabetic patients

Structured interview schedule was used to assess the foot care practice of diabetic patients. The total score ranged from 0 to 34. The scale was further arbitrarily classified as:

Good practice: 25-34 (above 75%)

Poor practice: 0-24

Frequency and percentage distribution of practice scores are presented in Table 3

Table 3

Frequency and Percentage distribution of the foot care practice of diabetic patients

n = 120

Foot care Practice	Frequency	Percentage (%)
Good Practice (25-34)	27	22.5
Poor Practice (0-24)	93	**77.5**

It is evident from Table 3 that, majority (77.5%) of diabetic patients were having poor practice regarding foot care and only 22.5% of diabetic patients were having good practice on foot care.

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Table 4 Mean, Median, Range and Standard deviation of foot care practice of diabetic patients

n = 120

	Mean	Median	Range	SD
Practice scores	16.1	15.5	12-28	± 3.7

Data presented in the Table 4 shows that the foot care practice scores of diabetic patients ranged from 12-28, with a mean score of 16.1, median of 15.5 and standard deviation of ± 3.7.

Section: 4

Findings related to the association between the foot care practice and the selected personal variables of diabetic patients

Chi-square values were computed to find out the association between the foot care practice and the selected personal variables of diabetic patients. To test the statistical significance, following null hypothesis was stated.

H_0: There will be no statistically significant association between the foot care practice and the selected personal variables of diabetic patients. Data presented in Table 5 shows that, there was statistically significant association between the foot care practice of diabetic patients and their selected personal variable viz. age, occupation, monthly family income, place of residence and previous exposure to teaching programs on foot care.

Association between age and foot care practice of diabetic patients

There was statistically significant association between the age and the foot care practice of diabetic patients indicating that diabetic patients who were aged above 45 years were having better foot care practice compared to younger patients. Hence the researcher do not accept the null hypothesis and it is inferred that age of diabetic patients had an influence on their foot care practice.

Association between occupation and foot care practice of diabetic patients

Data shows that there was statistically significant association between the occupation and the foot care practice of diabetic patients indicating that diabetic patients who were employed were having good foot care practice compared to the patients who were doing agriculture. Hence the researcher do not accept the null hypothesis and it is inferred that occupation of diabetic patients had influence on their foot care practice.

Association between monthly family income and foot care practice of diabetic patients

Data shows that there was statistically significant association between the monthly family income and the foot care practice of diabetic patients indicating that diabetic patients who were having monthly high family income were having good foot care practice compared to patients with less family income. Hence the researcher do not accept the null hypothesis and it is inferred that monthly family income of diabetic patients had influence on their foot care practice.

Association between place of residence and foot care practice of diabetic patients

Data shows that there was statistically significant association between the place of residence and the foot care practice of diabetic patients indicating that diabetic patients who were residing in urban areas were having good foot care practice compared to the patients who were staying in the rural areas. Hence the researcher do not accept the null hypothesis and it is

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inferred that the residence of patients had an influence on their footcare practice.

Association between previous exposure to teaching program on foot care and foot care practice

Data shows that there was statistically significant association between the previous exposure to teaching programs on foot care and the foot care practice of diabetic patients indicating that diabetic patients who had previous exposure to teaching programs on foot care were having good foot care practice compared to the patients who were not exposed to teaching programs previously on foot care. Hence the researcher do not accept the null hypothesis and it is inferred that previous educational programs on footcare had an influence on the foot care practice of diabetic patients.

Discussion

1. Findings Related To The Selected Personal Variables OfDiabetic Patients

Data related to the age of diabetic patients revealed that majority (49.2%) of diabetic patients were in the age group of more than 45-60 years. Majority (67.5%) of the diabetic patients were males. 21% of the subjects were having educational qualification of Degree. Majority (57%) of diabetic patients were doing agriculture. Study results are consistent with the results of another study conducted to analyze the barriers of foot care among 313 diabetic patients in Ethiopia, which also stated that 39.9% of subjects were farmers[5].

33.3% subjects were having a monthly income of up to RS 5000/-. Majority of subjects (27.5%) were having duration of illness more than 10-15 years. Majority of the subjects (76%) belonged to joint family. 55.8% of the subjects were from rural areas. Results of study conducted to assess the prevalence of foot ulcer among 216 diabetic patients in Ethiopia also reported that majority (53.1%) of the subjects were from rural areas[20, 30].

Majority (85%) of the subjects were not having previous exposure to teaching program on foot care.

2. Indings Related To The Perceived Barriers Of Foot CareAmong Diabetic Patients

Study findings have revealed many factors which have interfered with the regular practice of foot care practice among diabetic patients. These factors were categorized as:

a) Patient-related factors and b) Health care system related factors. Patient related factors consisted of lack of knowledge regarding foot care, problems related to advancing age, time constraints, and work pattern, lack of financial support and religious/cultural practices of diabetic patients.

a) Patient-related factors

i. Lack of knowledge regarding foot care

Majority of diabetic patients expressed that lack of adequate knowledge regarding the importance of foot care and the technique of foot care was a major barrier which has affected the daily care of their feet.

81.6% of diabetic patients agreed that they were not aware about correct technique of foot care practice. 67.5% of diabetic patients were not aware of the importance of regular foot care and 60% were not aware of the importance of wearing correct/appropriate size foot wear. 50% of patients expressed that were not able to detect early manifestations of nerve damage.

Similar findings are reported in other studies conducted to assess the barriers of foot care among diabetic patients which also reported that lack of adequate knowledge regarding the importance of foot care was a barrier for their regular foot care practice[5, 24,25]

Another study conducted to assess the barriers of foot care among 110 diabetic patients in

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Kannur, Kerala also reported that majority of patients had not received any information from their health care people regarding the importance of foot care. Results are consistent with the findings of a study conducted among 137 adult diabetic patients at Ibadan health care Nigeria, which also reported that only 22.6% of patients were knowing how to wash their feet and 92% of patients had never received any education on foot care from their health care providers[6].

ii. Problems related to advancing age

Many diabetic patients expressed that advancing age and age related physical problems were hindering factors for their daily foot care practice. Majority (65%) of diabetic patients agreed that it is difficult to detect foot problems due to numbness/lack of sensation in their feet. 50% patients expressed that the advancing age and visual problems inhibited them to perform regular foot care examination. 38.3% of patients agreed that they are unable to do regular foot exercises due to frequent illnesses.

Study findings are supported by the results of another study which has assessed the foot care practice of diabetic patients in Egypt, which also reported that musculoskeletal problems, presence of co morbidities and physical disability related to advancing age were a major barrier to their regular foot care practice[34].

iii. Time Constraints

Majority (60%) of patients agreed that they are not able to visit their doctor regularly because of time constraints as they are engaged in agricultural fields most ofthe time. (58%) of diabetic patients expressed that they are not getting enough time to take care of their feet daily.

iv. Work pattern

64.2% of patients agreed that, their work pattern inhibited them to wear recommended foot wear for diabetes. Majority of diabetic patients were doing agriculture and they were not able to wear the recommended foot wears in the fields.

A study conducted among 313 diabetic patients in Ethiopia to assess practice and barriers of diabetic foot self care also reported that inconveniency for work was a major barrier for foot care as expressed by diabetic patients[5]. Majority (67%) of diabetic patients expressed that they are not able to afford the recommended foot wear due to their economic constraints. Similar results are stated in a correlational study conducted to explore the barriers of foot care among older adults with diabetes in Egypt which also reported that lack of adequate income for the long term careof diabetes was a barrier to the foot care practice of diabetic patients[34].

v. Religious and Cultural factors

83% of diabetic patients agreed that their cultural and religious factors inhibited them from wearing chappals always. Many patients expressed that they cannot wear chappals to temples, and the agricultural fields as they have the specific religious beliefs.

Study findings are consistent with the result of another study conducted among 678 diabetic patients in North India, which reported that many rural patients preferred to walk bare foot on roads as a part of religious rituals, which has predisposed them to develop diabetic foot ulcers[20].

b) Health care system related factors

Majority (73.3%) of patients expressed that they avoid visit to health care centers because of longer queues in the hospital. 70.8% of diabetic patients agreed that they find it difficult to approach the doctor for minor foot problems. 61.7% of patients agreed that they prefer traditional way of healing for foot injuries and problems. Few patients (29.2%) expressed that they do not have the practice of going to doctor for minor foot problems and they prefer to apply home

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remedies such as applying turmeric powder over the wounds

42.3% of patients agreed that staffs in the treatment center are busy to answer their questions related to foot care and 30% of them agreed that they are not getting adequate information about foot care from their health care personnel. Only 10% of patients expressed that they find it difficult to follow the instructions from the health care personnel. A descriptive study which has assessed the barriers of foot care among 313 diabetic patients in Ethiopia also stated that poor communication between patients and nurses or physician was a major barrier of their regular foot care practice of diabetic patients[5].

Another study which has analyzed the risk factors influencing diabetic foot ulcers also reported lack of communication between the patients and physicians was a major limitation for their regular foot care[35]. A study which has analyzed the foot care barriers among diabetic patients in Egypt also stated that overcrowded clinics and hospitals was a major barrier expressed by the patients[34].

38.3% of diabetic patients expressed that they find it difficult to visit the doctor frequently as they stay away from treatment centre. Few patients expressed that inadequate transportation facilities from their villages inhibited them from visiting their doctors regularly.

3. Findings Related To The Foot Care Practice Among Diabetic Patients

Data related to the foot care practice of diabetic patients revealed that majority (77.5%) of diabetic patients were having poor foot care practice and only 22.5% of patients were having good practice of foot care.

Results of a hospital based cross sectional study conducted among 103 patients with diabetic foot also reported that majority (51.1%) of diabetic patients had poor foot care practice[2]. Results are consistent with the findings of another cross-sectional study conducted among 103 diabetic patients in Puduchery which also revealed that practice of foot care among diabetic patients was poor and the study emphasized the need for foot care education in primary care settings to improve the foot care practice of diabetic patients[37]. Similar findings were reported by other studies conducted among adult diabetic patients which also stated that patients were having poor foot care practice[36,38,39,40,42 & 43].

Another case controlled, prospective study conducted to analyze risk factors of foot care among 250 diabetic patients also documented poor foot care practice among study subjects. The study emphasized the need for a focused campaign to educate patients as well as health care workers[41].

4. Findings related to the association between the foot care practice and the selected personal variables of diabetic patients.

Association between the age and foot care practice of diabetic patients

Data shows that there was statistically significant association between the age and the foot care practice of diabetic patients indicating that diabetic patients who were aged above 45 years were having better foot care practice compared to younger patients.

Results are consistent with the findings of another study conducted among 110 diabetic patients at Kannur, Kerala which also reported that age of diabetic patients had a significant association with the foot care practice of patients[43].

Association between the place of residence and foot care practice of diabeticpatients

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Data reveals that there was statistically significant association between the place of residence and the foot care practice of diabetic patients indicating that diabetic patients residing in urban areas were having good foot care practice compared to the patients who were staying in the rural areas. Study findings are supported with the results of other studies stated that the risk of diabetic foot ulcer was higher in patients of rural areas than in urban diabetic patients[20, 30].

In the present study majority (57%) of subjects were farmers and were residing in rural areas (55.8%). Significant association found between the foot care practice of diabetic patients and their occupation (agriculture) and rural residence may be due to the fact that patients in rural areas often spent most of their time in agricultural fields neglecting their foot care.

Association between the monthly family income and foot care practice of diabetic patients

Results of the study revealed that there was statistically significant association between the monthly family income of diabetic patients and foot care practice indicating that patients who had high monthly income had better foot care practice compared to patients with less monthly income.

Study findings are supported with the results of another study conducted to assess the awareness about foot care among 400 diabetic patients which also stated that foot care practice of patients was having association with their socio-economics.

Association between the previous exposure to teaching program on foot care and foot care practice of diabetic patients

Data shows that there was statistically significant association between the previous exposure to teaching programs on foot care and the foot care practice of diabetic patients indicating that diabetic patients who had previous exposure to teaching programs on foot care were having good foot care practice compared to the patients who were not exposed to teaching programs previously on foot care.

Study findings are supported with the results of another study conducted among 400 diabetic patients in tertiary care hospital Northern India which also revealed that previous foot care education was positively associated with foot care awareness and foot care practice of patients [43].

Study findings also revealed that there was no statistically significant association between the selected personal variables of diabetic patients viz. gender, religion, educational status, duration of illness, type of family and distance of residence from the health care institution and their foot care practice. Results are contradicted with the findings of a study conducted to analyze the barriers of foot care in 110 diabetic patients in Kannur which reported that longer duration of diabetes mellitus had a significant association with foot care practice of patients[43].

Conclusion

Data was collected from 120 diabetic patients attending outpatient and inpatient services of Krishna Hospital and Medical Research centre Karad. Collected data was analyzed by using descriptive and inferential statistics.

Analysis of findings revealed that majority (77.5%) of the diabetic patients were having poor practice regarding foot care and only 22.5% were having good practice of foot care.

Diabetic patients expressed many barriers which have interfered with their regular practice of foot care. Perceived barriers of foot care among diabetic patients were categorized as patient related factors and health care system related factors.

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Author for correspondence:
Dr.Tukaram B. Zagade Professor, Krishna Institute of Nursing Sciences, Krishna Institute of Medical Sciences "Deemed To Be University", Malkapur, Karad,Dist- Satara (Maharashtra) India-415539
Email-tukaramzagade49@gmail.com *Cell:9881678505*

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