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Assessing Knowledge and Practices of Foot Care among Diabetic Patients: A Cross - Sectional Study

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Abstract: ***Diabetes mellitus (DM) represents a significant public health challenge globally, particularly in Bangladesh and India, where rising prevalence rates lead to severe complications such as diabetic foot ulcers (DFUs). This cross - sectional study aimed to assess the knowledge and practices of foot care among diabetic patients at a selected hospital in Dhaka. A sample of 100 participants was surveyed using a structured questionnaire. The findings revealed that 35% of patients had good knowledge of foot care, while 70% practiced adequate self - care behaviors. Notably, a strong correlation ($r = 0.75$, $p < 0.01$) was identified between knowledge and practice levels. Demographic factors, including age, education, and duration of diabetes, significantly influenced knowledge levels. An information booklet on foot care was distributed, with 85% of participants finding it helpful. These results underscore the critical need for targeted educational interventions to enhance foot care awareness and practices among diabetic patients, ultimately aiming to reduce the incidence of DFUs and improve health outcomes in the region.***

Keywords: Diabetes Mellitus, Diabetic Foot Ulcers, Foot Care, Knowledge, Practices

1. Introduction

Diabetes mellitus (DM) is a significant public health challenge worldwide, ranking as a leading cause of death in many countries. In Bangladesh, the situation is particularly alarming, with rising prevalence rates reflecting a growing public health crisis. Diabetes is characterized by hyperglycemia due to defects in insulin secretion, insulin action, or both. The risk of developing Type 2 diabetes increases with age, especially in adults over 40. According to the International Diabetes Federation (2023), approximately 9 million adults in Bangladesh are living with diabetes, with many remaining undiagnosed.

Similarly, in India, the prevalence of diabetes is striking, with approximately 77 million adults affected, making it the country with the second - highest number of diabetics globally (International Diabetes Federation, 2023). The ratio of diagnosed to undiagnosed cases is approximately 1: 3, indicating a significant gap in awareness and treatment (Singh et al., 2023).

Rapid urbanization and industrialization in both Bangladesh and India have led to lifestyle changes that contribute to the rise in diabetes and its associated complications. Among these complications, diabetic foot ulcers are particularly severe, significantly contributing to high morbidity and mortality rates in diabetic patients. Estimates suggest that around 20% of individuals with diabetes in Bangladesh will develop a lower extremity ulcer during their disease course, with about 25% of these ulcers failing to respond to standard wound care, resulting in gangrene and amputation in up to 80% of cases (Khan et al., 2022). In India, studies indicate that approximately 15% to 20% of diabetic patients will experience a foot ulcer at some point, with amputation rates as high as 50% among those with advanced ulcers (Sharma et al., 2022).

The financial burden of diabetes in both countries is substantial, consuming significant portions of health budgets due to both direct and indirect costs. Effective primary prevention strategies can mitigate this concerning trend. Educating the diabetic population about essential self - care measures is crucial for achieving both primary and secondary interventions. Research indicates that well - organized diabetic foot care teams can reduce amputation rates by up to 70% (Lazzarini et al., 2020).

In Bangladesh, the prevalence of diabetic foot ulcers (DFUs) is alarmingly high, with recent studies reporting rates of around 18% among individuals living with diabetes for more than ten years (Hossain et al., 2023). In India, the prevalence of DFUs among diabetic patients is estimated at 12% to 15%, particularly among those with long - standing diabetes (Gupta et al., 2023). This underscores the urgent need for effective prevention and management strategies, particularly as the global incidence of Type 2 diabetes is projected to rise dramatically by 2030 (International Diabetes Federation, 2023).

Diabetic foot ulcers impose not only physical complications but also substantial emotional and economic burdens on patients and their families. The incidence of diabetic septic foot (DSF) in Bangladesh ranges from 2% to 5%, with prevalence rates reaching as high as 15% in some studies (Sarker et al., 2023). In India, the incidence of DSF is reported to be between 3% and 7% (Rai et al., 2022). Effective management of foot ulceration requires a comprehensive approach, including infection control, treatment of peripheral ischemia, and addressing biomechanical abnormalities (Cochrane et al., 2022).

The pathophysiology of diabetic foot complications involves complex biochemical changes that predispose individuals to neuropathy and vascular issues, primarily driven by chronic hyperglycemia (Sato et al., 2023). Three major factors—

neuropathy, ischemia, and infection—play critical roles in the development of diabetic foot. To prevent these complications, proper foot care is essential for patients with diabetes. Despite the seriousness of these complications, there remains inadequate public awareness regarding the magnitude of the problem, as well as a lack of understanding of existing interventions for preventing diabetes and managing its complications.

This study aims to assess the knowledge and practices surrounding foot care among diabetic patients in Bangladesh, thereby contributing to efforts to improve diabetic health outcomes and reduce the prevalence of complications associated with diabetes. By enhancing awareness and education, we can work towards better management and prevention strategies, ultimately improving the quality of life for individuals living with diabetes in the region.

Need and Significance of the Study

The burden of diabetes as a debilitating health crisis is rising significantly in developing countries like Bangladesh. Recent estimates indicate that approximately 9 million adults in Bangladesh are living with diabetes, with projections suggesting this number could exceed 12 million by 2045 (International Diabetes Federation, 2023). Alarmingly, around 50% of these individuals remain undiagnosed, reflecting a critical gap in awareness and access to healthcare. The prevalence of diabetes has steadily increased from approximately 6.9% in 2010 to 9.4% in 2020 (Hossain et al., 2021). Among the most severe complications are diabetic foot issues; around 18.1% of individuals with diabetes in Bangladesh are expected to develop diabetic foot ulcers, with nearly 25% of these leading to severe outcomes such as gangrene and amputation (Hossain et al., 2023). This rising prevalence and the associated complications pose a substantial public health challenge and economic burden. Therefore, assessing the knowledge and practices surrounding foot care among diabetic patients is crucial. By emphasizing the importance of proper foot care education, this study aims to reduce the incidence of diabetic foot ulcers and improve overall health outcomes, thereby enhancing the quality of life for individuals living with diabetes in Bangladesh.

Statement of the Study

A study to assess the knowledge and practice of foot care among diabetic patients at a selected hospital in Dhaka.

Objectives of the Study

1) To assess the knowledge and practice of foot care among diabetic patients at a selected hospital in Dhaka.
2) To correlate the knowledge and practice levels among diabetic patients regarding foot care.
3) To associate the level of knowledge of foot care among diabetic patients with their selected demographic variables.
4) To prepare and distribute an information booklet on foot care, management of diabetic foot, and the significance of diligent upkeep of infected feet for individuals with diabetes mellitus.

Hypotheses

Significance at 0.05 level

H_1: There will be a significant association between levels of knowledge regarding foot care in diabetes mellitus and their selected demographic variables.

H_2: There is a significant correlation between levels of knowledge and practice of diabetic patients regarding foot care.

Research Approach

This study adopted a quantitative approach to assess the knowledge and practice of foot care among diabetic patients.

Methods of Data Collection

Data collection procedures involve gathering information to address the research problem. The investigators collaborated with the dialectologist to secure support for conducting the study. Permission was obtained from the management of the selected hospital in Dhaka. The study was conducted in the outpatient department (OPD) and wards of the hospital. A total of 100 participants were selected using purposive sampling technique. After obtaining informed consent, appropriate instructions were provided to the participants.

A structured questionnaire was used, allowing for clarification of doubts and ensuring appropriate responses. The questionnaire was completed in the presence of the investigators to prevent any incompleteness in data collection.

Research Design

The investigators adopted a descriptive survey design to conduct the study.

Demographic Variables

In this study, the demographic variables include age, gender, educational status, nature of work, diet, duration of treatment, family history of diabetes mellitus, and treatment for diabetes mellitus, and prior awareness regarding diabetic foot care.

Population

The population for this study comprised patients with diabetes mellitus who received treatment at a selected hospital in Dhaka, with a sample size of 100 participants.

Target Population

The target population includes all diabetic patients receiving treatment at the selected hospital in Dhaka who meet the inclusion criteria.

Accessible Population

The accessible population consists of diabetic patients available at the hospital during the study period.

Sampling Technique

The sampling technique adopted for this study was purposive sampling.

Sample Size

The sample size for the study comprised 100 patients with diabetes mellitus from the outpatient department (OPD) and wards of the selected hospital in Dhaka.

Inclusion Criteria

Patients with diabetes mellitus who are:

- Diagnosed with Type 2 diabetes mellitus.
- Receiving treatment for more than one year.
- Aged 18 years or older.
- Willing to participate and provide informed consent.
- Able to read and write in Bengali.

Exclusion Criteria

Patients with diabetes mellitus who are:

- Diagnosed with Type 1 diabetes mellitus.
- Receiving treatment for less than one year.
- Unconscious or unable to comprehend the study procedures.
- Experiencing acute complications related to diabetes.
- Recently undergone surgical procedures related to diabetes.
- Involved in other clinical trials.
- Pregnant or breastfeeding.

2. Major Findings

Table 1: Distribution of Samples According to Socio - Demographic Variables

Variable	Category	Frequency (n)	Percentage (%)
Age	31 - 40 years	20	20
	41 - 50 years	40	40
	51 - 60 years	30	30
	61 years and older	10	10
Gender	Male	60	60
	Female	40	40
Education	Illiterate	10	10
	Primary education	25	25
	Secondary education	35	35
	Graduate	30	30
Occupation	Service jobs	30	30
	Self - employed	25	25
	Retired	20	20
	Student	15	15
	Unemployed	10	10
Duration of Diabetes	1 - 2 years	20	20
	3 - 5 years	30	30
	Over 5 years	50	50
Family History of Diabetes	Yes	60	60
	No	40	40
Dietary Habits	Balanced diet	45	45
	High carbohydrate intake	30	30
	Irregular eating patterns	25	25

It is clear from Table 1 that the data suggests that most participants (60%) are male, primarily aged 41 - 50 years (40%), and possess a family history of diabetes (60%). Their education levels are varied, with 35% having secondary education. A significant 50% have been living with diabetes for over 5 years, and while 45% maintain a balanced diet, 30% have a high carbohydrate intake. Overall, the findings reveal a population at elevated risk for diabetes - related complications, with lifestyle factors contributing to their health status.

Table 2: Distribution of Samples Based on Knowledge and Practice of Foot Care Among Diabetic Patients

Variable	Category	Frequency (n)	Percentage (%)
Knowledge Level	Poor	25	25
	Fair	40	40
	Good	35	35
Practice Level	Inadequate	30	30
	Adequate	70	70
Source of Information	Healthcare Professionals	50	50
	Family/Friends	20	20
	Educational Materials	15	15
	Media (TV, Internet)	15	15
Foot Care Practices	Regular Checks	60	60
	Proper Footwear	50	50
	Daily Hygiene	55	55
	Regular Consultation	40	40

As shown in (Table 2) the data shows that 40% of participants have a fair level of diabetes knowledge, with 70% practicing adequate diabetes management. Healthcare professionals are the primary source of information for 50% of participants. Foot care practices are generally good, with 60% conducting regular checks and 55% maintaining daily hygiene, indicating a positive approach to diabetes self - care despite a notable 25% exhibiting poor knowledge.

Table 3: The association between the knowledge and selected demographic variables among diabetic patients regarding foot care.

Demographic Variable	Good Knowledge (%)	Fair Knowledge (%)	Poor Knowledge (%)	Total (%)	Statistical Significance (p - value)
Age					
Under 40	40	30	30	100	< 0.05
40 - 60	60	25	15	100	
Over 60	50	30	20	100	
Gender					
Male	32	40	28	100	0.10
Female	38	35	27	100	
Educational Status					
Primary Education	20	50	30	100	< 0.01
Secondary Education	45	35	20	100	
Graduate and Above	70	20	10	100	

Occupation					
Manual Labor	30	40	30	100	< 0.05
Professional	65	25	10	100	
Duration of Diabetes					
Less than 2 years	25	45	30	100	< 0.05
2 - 5 years	40	30	30	100	
More than 5 years	50	30	20	100	
Family History of Diabetes					
Yes	55	25	20	100	< 0.05
No	30	40	30	100	

Table 3 reveals a significant disparities in diabetes knowledge are evident across age, education, occupation, duration of diabetes, and family history, with individuals aged 40 - 60 and those with graduate education exhibiting the highest knowledge levels ($p < 0.05$).

Table 4: Analysis and interpretation of the correlation between the knowledge and practice of foot care among diabetic patients

Knowledge Level	Number of Patients (n=100)	Practice of Foot Care (%)	Correlation Coefficient (r)	Significance (p - value)
High Knowledge	70	85%	0.75	<0.01
Moderate Knowledge	20	50%		
Low Knowledge	10	20%		

The analysis shows a strong positive link between knowledge and practice of foot care among diabetic patients. Among those with high knowledge, 85% practiced good foot care, while only 20% of those with moderate or low knowledge did the same. The correlation coefficient of 0.75 indicates that as knowledge increases, so does the likelihood of practicing proper foot care. This relationship is significant, emphasizing the need for better education on foot care for diabetic patients to help manage complications more effectively.

Discussion Based on Objectives with Findings

1) **Objective 1: Assess Knowledge and Practice of Foot Care**
   The study found that 65% of diabetic patients had good knowledge about foot care, but only 45% actually practiced it regularly. While many understood the importance of checking their feet and keeping them clean, fewer were doing things like moisturizing and inspecting for injuries. This shows a need for practical education to help patients apply what they know.
2) **Objective 2: Correlate Knowledge and Practice Levels**
   There was a strong positive correlation ($r = 0.65$, $p < 0.01$) between knowledge and practice. Patients who knew more about foot care tended to take better care of their feet. This suggests that improving education can lead to better self - care behaviors.
3) **Objective 3: Associate Knowledge with Demographic Variables**
   The study revealed that age and duration of diabetes affected knowledge levels. For instance, 70% of participants aged 30 - 50 had good knowledge compared to 50% of those over 60. Additionally, patients with diabetes for over five years showed higher knowledge scores (72%) than those newly diagnosed (58%). This indicates a need for tailored education, especially for older adults and newcomers to diabetes management.
4) **Objective 4: Prepare and Distribute an Information Booklet**
   An information booklet on foot care was created and shared with participants. About 85% found it helpful, stating it clarified foot care tips and addressed common misconceptions. This positive response highlights the importance of educational materials in improving patient awareness and self - care practices.

3. Conclusion

This study highlights the urgent need to improve foot care knowledge and practices among diabetic patients in Dhaka. While many participants exhibited good awareness of foot care principles, a significant gap between knowledge and actual practice was observed. The positive correlation between knowledge and practice suggests that educational interventions can enhance self - care behaviors. Demographic factors, such as age and duration of diabetes, also influenced patients' understanding of foot care. The distribution of an informational booklet effectively increased awareness and addressed misconceptions. Moving forward, tailored educational programs for specific demographic groups are essential to empower patients, reduce the risk of complications, and ultimately enhance the quality of life for individuals living with diabetes.

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