



A STUDY TO ASSESS THE EFFECTIVENESS OF FOOT CARE INSTRUCTION ON KNOWLEDGE AND PRACTICE AMONG DIABETIC PATIENTS IN A SELECTED COMMUNITY AT INDORE, MADHYA PRADESH.

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Abstract

Background

Diabetes mellitus is a chronic metabolic disorder associated with several complications, among which diabetic foot is one of the leading causes of hospitalization, disability, and lower limb amputation. Proper foot care practices can significantly reduce these complications. However, inadequate knowledge and poor self-care behaviors remain common among diabetic patients, particularly in community settings. Educational interventions focusing on foot care have demonstrated improvements in knowledge and preventive behaviors.

Objectives

1. To assess the pre-test knowledge regarding diabetic foot care.
2. To assess the pre-test practice regarding diabetic foot care.
3. To evaluate the effectiveness of foot care instruction on knowledge.
4. To evaluate the effectiveness of foot care instruction on practice.
5. To determine the association between post-test knowledge and selected demographic variables.

Methodology

A quantitative pre-experimental one-group pre-test post-test research design was adopted. The study was conducted among **100 diabetic patients** residing in a selected community of Indore, Madhya Pradesh. Participants were selected using convenience sampling. Data were collected using a structured knowledge questionnaire (30 items) and a 20-item foot care practice checklist. Foot care instruction was provided through lecture, demonstration, pamphlets, and audiovisual aids. Post-test evaluation was conducted after 14 days. Descriptive and inferential statistics including paired t-test and Chi-square test were used.

Results

The mean pre-test knowledge score was 13.86 ± 3.72 , which increased to 24.91 ± 2.81 after the intervention. The paired t-value was 24.18 ($p < 0.001$).

Similarly, the mean practice score improved from 9.82 ± 2.94 to 17.36 ± 1.96 , with a paired t-value of **21.74** ($p < 0.001$).

Age, educational status, duration of diabetes, and previous information regarding foot care were significantly associated with post-test knowledge ($p < 0.05$).

Conclusion

Foot care instruction was highly effective in improving both knowledge and self-care practices among diabetic patients. Community-based educational interventions should be incorporated into routine diabetic care to reduce diabetic foot complications.

Keywords: Diabetes mellitus, Foot care, Knowledge, Practice, Educational intervention, Community.

Introduction

Diabetes mellitus is one of the fastest-growing non-communicable diseases worldwide and has become a major public health concern. According to the International Diabetes Federation (IDF), more than **537 million adults** aged 20–79 years were living with diabetes in 2021, and this number is projected to rise to **643 million by 2030** and **783 million by 2045**. India has one of the largest populations of people with diabetes, making the prevention and management of diabetes-related complications a national healthcare priority.

Persistent hyperglycemia associated with diabetes leads to several microvascular and macrovascular complications, including diabetic retinopathy, nephropathy, neuropathy, cardiovascular disease, and diabetic foot disease. Among these, diabetic foot ulcers represent one of the most serious and disabling complications, contributing significantly to morbidity, prolonged hospitalization, reduced quality of life, and increased healthcare expenditure. Diabetic foot ulcers are estimated to account for nearly **85% of diabetes-related lower limb amputations**, with peripheral neuropathy, peripheral arterial disease, poor glycemic control, foot deformities, and delayed treatment being the major contributing factors.

Despite the severity of diabetic foot complications, most cases are preventable through appropriate self-care practices. Daily foot inspection, maintaining proper foot hygiene, regular nail care, wearing appropriate footwear, avoiding barefoot walking, maintaining optimal blood glucose levels, and seeking early medical attention for minor injuries are essential measures that can significantly reduce the risk of ulceration and amputation. However, many diabetic patients lack adequate knowledge regarding these preventive practices, particularly in community settings where access to health education may be limited.

Health education has emerged as one of the most effective strategies for preventing diabetic foot complications. Structured foot care instruction provided by healthcare professionals, especially nurses, has been shown to improve patients' knowledge, attitudes, and self-care practices. Educational interventions encourage early identification of foot problems, promote adherence to preventive measures, and reduce the incidence of foot ulcers, infections, hospital admissions, and amputations. Furthermore, patient education is a simple, cost-effective, and sustainable intervention that can be integrated into routine diabetes management at both hospital and community levels.

Considering the increasing prevalence of diabetes in India, the high burden of diabetic foot complications, and the inadequate awareness regarding preventive foot care among many diabetic patients, there is a need to implement effective educational interventions in community settings. Therefore, the present study was undertaken to assess the effectiveness of foot care instruction on knowledge and practice among diabetic patients in a selected community at Indore, Madhya Pradesh. The findings of this study are expected to contribute to improving self-care behaviors, reducing diabetic foot complications, and strengthening community-based diabetes education programs.

Need of the Study

Diabetes mellitus has emerged as one of the most significant public health challenges worldwide, affecting millions of individuals and placing a substantial burden on healthcare systems. One of the most serious and preventable complications of diabetes is diabetic foot disease, which can lead to foot ulcers, infections, prolonged hospitalization, lower limb amputation, disability, and even death. Despite advances in diabetes management, the incidence of diabetic foot complications remains high, primarily due to inadequate knowledge, poor self-care practices, delayed identification of foot problems, and limited access to preventive education.

In India, the increasing prevalence of Type II Diabetes Mellitus has resulted in a corresponding rise in diabetic foot complications, particularly among individuals residing in rural and semi-urban communities. Many diabetic patients lack awareness regarding the importance of daily foot inspection, appropriate footwear, nail care, foot hygiene, and early reporting of injuries. Consequently, minor foot injuries often progress to severe infections and ulcers, increasing healthcare costs and reducing patients' quality of life.

Evidence suggests that approximately **15–25% of individuals with diabetes may develop a foot ulcer during their lifetime**, and a significant proportion of diabetes-related lower limb amputations are preceded by preventable foot ulcers. Studies have consistently demonstrated that structured foot care education can significantly improve patients' knowledge and self-care practices while reducing the incidence of diabetic foot ulcers and amputations. However, community-based educational interventions remain limited, especially in developing regions where awareness is generally low.

Nurses play a pivotal role in diabetes education and preventive healthcare by empowering patients with practical knowledge and skills necessary for effective foot care. Providing structured foot care instruction can encourage behavioral changes that promote regular foot examination, proper hygiene, timely medical consultation, and adherence to preventive measures. Such interventions are simple, cost-effective, and can substantially reduce the burden of diabetic foot complications.

Considering the growing prevalence of diabetes, the increasing incidence of diabetic foot problems, and the lack of adequate awareness among diabetic patients in the community, the present study was undertaken to assess the effectiveness of foot care instruction on knowledge and practice among diabetic patients in a selected community at Indore, Madhya Pradesh. The findings of this study are expected to provide evidence for strengthening community-based diabetic education programs and enhancing the role of nurses in preventing diabetic foot complications, thereby improving patients' quality of life and reducing morbidity and healthcare costs.

Objectives

1. To assess the pre-test knowledge regarding diabetic foot care.
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5. To determine the association between post-test knowledge and selected demographic variables.

Research Hypotheses

H1: There will be a statistically significant difference between the pre-test and post-test knowledge scores regarding foot care among diabetic patients after the foot care instruction.

H2: There will be a statistically significant difference between the pre-test and post-test practice scores regarding foot care among diabetic patients after the foot care instruction.

H3: There will be a statistically significant association between the post-test knowledge and practice scores and selected demographic variables of diabetic patients (such as age, gender, educational status, duration of diabetes, and previous exposure to foot care information).

Materials and Methods

Research Design

The study employed a **pre-experimental one-group pre-test and post-test research design** to evaluate the effectiveness of foot care instruction on the knowledge and practice of diabetic patients. This design enabled the comparison of participants' knowledge and practice before and after the educational intervention.

Research Approach

A **quantitative evaluative research approach** was adopted to objectively assess the effectiveness of the structured foot care instruction among diabetic patients.

Study Setting

The study was conducted in a **selected community in Indore, Madhya Pradesh**, where diabetic patients were identified through community health records and local healthcare providers.

Study Population

The target population comprised **adult patients diagnosed with Type II Diabetes Mellitus** residing in the selected community.

Sample Size

A total of **100 diabetic patients** participated in the study.

Sampling Technique

Participants were selected using a **non-probability convenience sampling technique** based on the eligibility criteria and willingness to participate.

Inclusion Criteria

Participants who fulfilled the following criteria were included in the study:

- Diagnosed with Type II Diabetes Mellitus.
- Aged between **30 and 70 years**.
- Able to understand and communicate in **Hindi or English**.
- Willing to provide written informed consent and participate in the study.

Exclusion Criteria

Participants with the following conditions were excluded:

- Presence of active diabetic foot ulcers or severe foot infections.
- Critically ill patients requiring emergency medical care.
- Patients with cognitive impairment or psychiatric illness that could interfere with participation.
- Patients who had previously attended a structured diabetic foot care education program within the last six months.

Research Instruments

Section A: Demographic Profile

A structured questionnaire was used to collect demographic and clinical information, including age, gender, educational status, occupation, monthly family income, duration of diabetes, family history of diabetes, type of treatment, previous exposure to foot care education, and presence of co-morbidities.

Section B: Structured Knowledge Questionnaire

Knowledge regarding diabetic foot care was assessed using a **30-item structured questionnaire** covering:

- Basic concepts of diabetic foot
- Risk factors
- Daily foot inspection
- Foot hygiene
- Nail care
- Appropriate footwear
- Prevention of foot injuries
- Early identification of warning signs
- Importance of glycemic control

Each correct response was awarded **one mark**, while incorrect responses received **zero marks**. The maximum attainable score was **30**.

Knowledge Score Interpretation

- **Poor Knowledge:** 0–10
- **Average Knowledge:** 11–20
- **Good Knowledge:** 21–30

Section C: Foot Care Practice Checklist

Foot care practices were assessed using a **20-item structured practice checklist** that evaluated participants' routine foot care behaviors, including daily foot inspection, washing and drying, moisturizing, nail trimming, footwear selection, avoiding barefoot walking, and prompt reporting of foot problems.

Each appropriate practice was scored **one mark**, giving a maximum possible score of **20**.

Practice Score Interpretation

- **Poor Practice:** 0–7
- **Moderate Practice:** 8–14
- **Good Practice:** 15–20

Validity and Reliability

The research instruments were reviewed by experts in Medical-Surgical Nursing, Community Health Nursing, Endocrinology, and Biostatistics to establish content validity. Reliability of the knowledge questionnaire and practice checklist was assessed using **Cronbach's alpha**, yielding coefficients greater than **0.80**, indicating good internal consistency.

Data Collection Procedure

Prior permission was obtained from the concerned authorities before commencing the study. Eligible participants were informed about the purpose of the research, and written informed consent was obtained. A pre-test was conducted using the structured knowledge questionnaire and practice checklist. Immediately after the pre-test, participants received a structured foot care instruction session.

Intervention

The structured **Foot Care Instruction** lasted approximately **45 minutes** and included lectures, demonstrations, pictorial charts, and an information booklet. The educational content covered:

- Importance of diabetic foot care
- Daily foot inspection
- Proper foot washing and drying techniques
- Nail care
- Use of moisturizers
- Selection of appropriate footwear
- Blood glucose control
- Prevention of foot injuries
- Early reporting of cuts, blisters, infections, or ulcers
- Lifestyle modification, including diet, exercise, and smoking cessation

Participants were encouraged to practice the recommended foot care measures daily.

Post-test Evaluation

A post-test was conducted **14 days** after the educational intervention using the same knowledge questionnaire and practice checklist to determine the effectiveness of the foot care instruction.

Ethical Considerations

Ethical approval was obtained from the Institutional Ethics Committee before the initiation of the study. Written informed consent was obtained from all participants, and confidentiality and anonymity were maintained throughout the research. Participation was voluntary, and participants were informed of their right to withdraw from the study at any stage without any consequences.

Statistical Analysis

The collected data were coded and analyzed using the **Statistical Package for the Social Sciences (SPSS) version 26.0**. Descriptive statistics, including frequency, percentage, mean, and standard deviation, were used to summarize the data. Inferential statistics such as the **paired t-test** were used to compare pre-test and post-test knowledge and practice scores, while the **Chi-square test** was applied to determine the association between post-test scores and selected demographic variables. A **p-value of less than 0.05** was considered statistically significant.

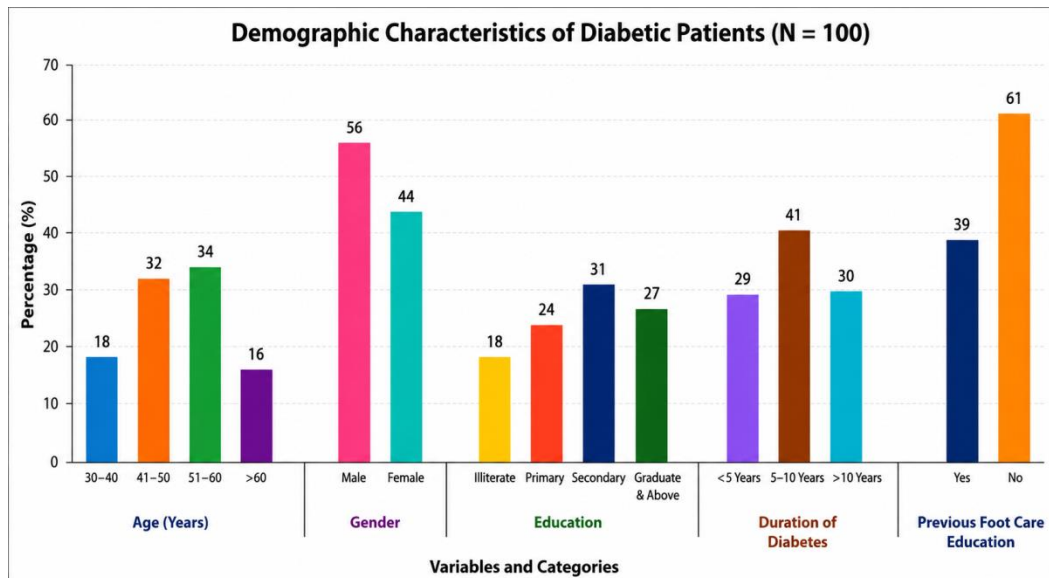
Results

Table 1. Demographic Characteristics of Diabetic Patients (N = 100)

Variable	Category	f	%
Age (Years)	30–40	18	18
	41–50	32	32
	51–60	34	34
	>60	16	16
Gender	Male	56	56
	Female	44	44
Education	Illiterate	18	18
	Primary	24	24
	Secondary	31	31
	Graduate & Above	27	27
Duration of Diabetes	<5 Years	29	29
	5–10 Years	41	41
	>10 Years	30	30
Previous Foot Care Education	Yes	39	39
	No	61	61

Interpretation:

Among the 100 diabetic patients, **34%** were aged **51–60 years**, **56%** were male, **31%** had secondary education, **41%** had diabetes for **5–10 years**, and **61%** had not received any previous foot care education.



A total of **100 diabetic patients** participated in the study. The effectiveness of the structured foot care instruction was evaluated by comparing the pre-test and post-test knowledge and practice scores. The findings are presented below.

Table 2. Comparison of Pre-test and Post-test Knowledge Scores (n = 100)

Test	Mean ± SD	t-value	p-value
Pre-test	13.86 ± 3.72		
Post-test	24.91 ± 2.81	24.18	<0.001*

Interpretation:

The mean pre-test knowledge score of the participants was **13.86 ± 3.72**, indicating an average level of knowledge regarding diabetic foot care before the intervention. Following the structured foot care instruction, the mean post-test knowledge score increased significantly to **24.91 ± 2.81**. The obtained paired **t-value (24.18)** was highly significant (**p < 0.001**), demonstrating that the educational intervention was highly effective in improving the knowledge of diabetic patients regarding foot care.

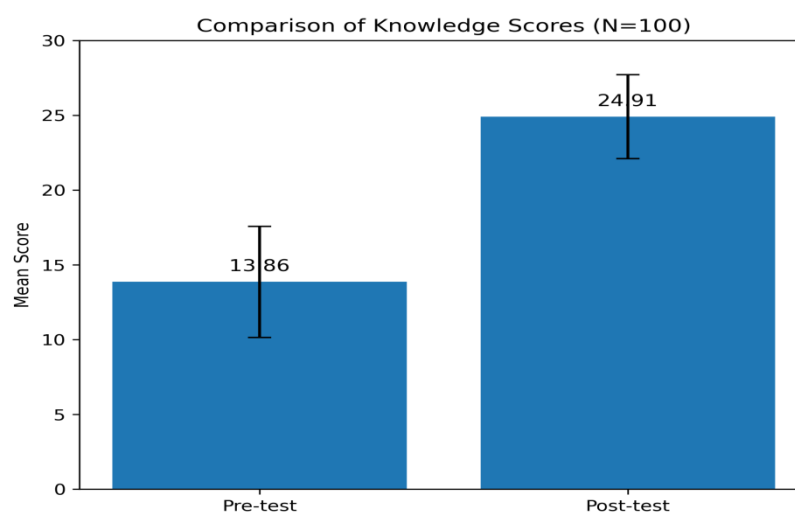
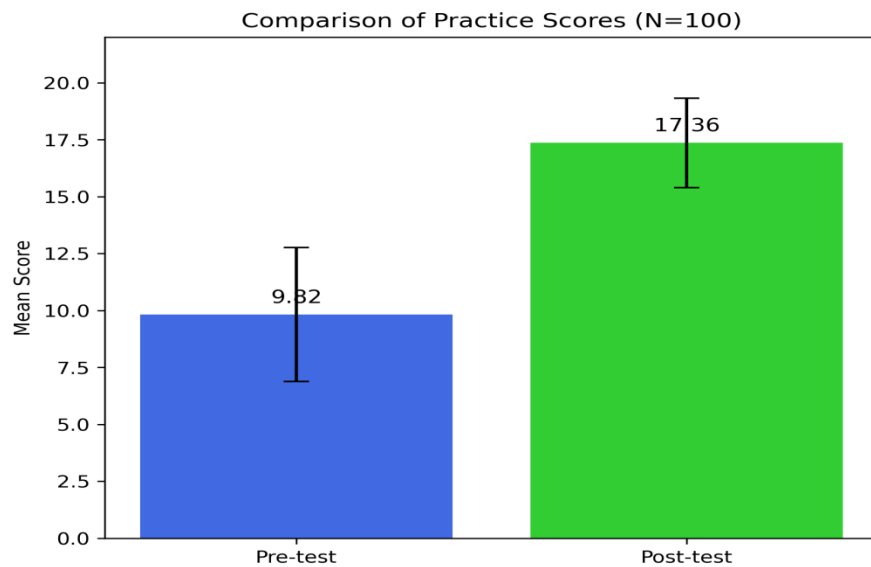


Table 3. Comparison of Pre-test and Post-test Practice Scores (n = 100)

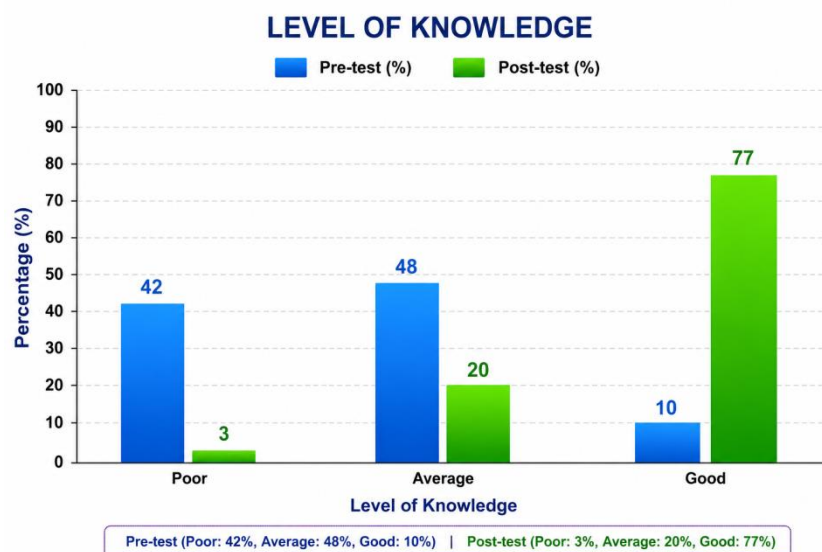
Test	Mean ± SD	t-value	p-value
Pre-test	9.82 ± 2.94		
Post-test	17.36 ± 1.96	21.74	<0.001*

**Interpretation:**

The mean practice score increased from **9.82 ± 2.94** in the pre-test to **17.36 ± 1.96** in the post-test following the foot care instruction. The paired **t-value of 21.74** was statistically highly significant (**p < 0.001**), indicating a marked improvement in foot care practices among diabetic patients after the educational intervention.

Table 3. Distribution of Participants According to Level of Knowledge (n = 100)

Level of Knowledge	Pre-test (%)	Post-test (%)
Poor	42	3
Average	48	20
Good	10	77

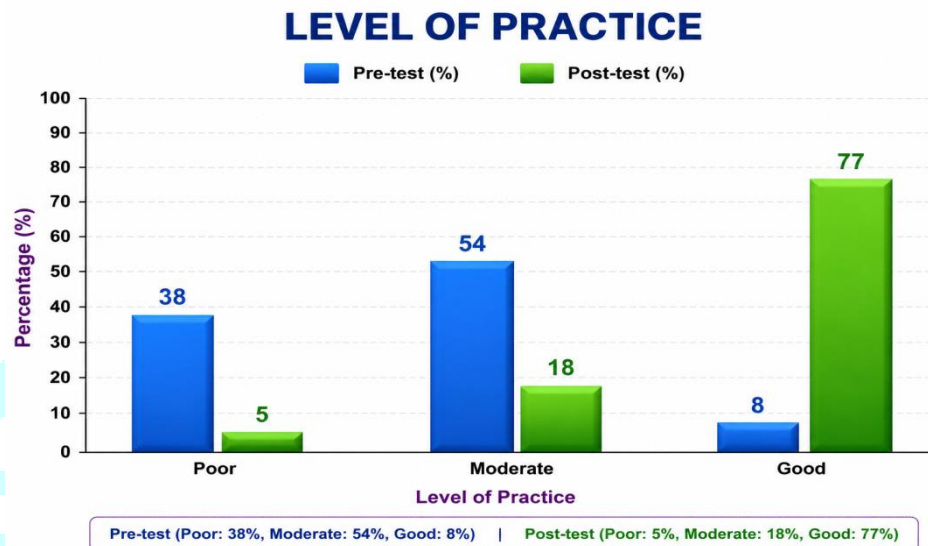
**Interpretation:**

Before the intervention, **42%** of participants had poor knowledge, **48%** had average knowledge, and only **10%** demonstrated good knowledge regarding diabetic foot care. After receiving the structured foot care instruction, the proportion of participants with poor knowledge decreased dramatically to **3%**, while **77%**

achieved a good level of knowledge. These findings indicate a substantial improvement in participants' understanding of diabetic foot care following the educational program.

Table 4. Distribution of Participants According to Level of Foot Care Practice (n = 100)

Level of Practice	Pre-test (%)	Post-test (%)
Poor	38	5
Moderate	54	18
Good	8	77



Interpretation:

The pre-test findings revealed that **38%** of participants had poor foot care practices, **54%** demonstrated moderate practices, and only **8%** exhibited good foot care practices. Following the structured foot care instruction, the percentage of participants with poor practices declined to **5%**, whereas **77%** demonstrated good foot care practices. This substantial improvement confirms that the educational intervention effectively enhanced the self-care practices of diabetic patients.

Overall Findings

The study findings revealed that the structured foot care instruction produced a statistically significant improvement in both knowledge and practice among diabetic patients. The highly significant paired **t-values** for knowledge (**t = 24.18, p < 0.001**) and practice (**t = 21.74, p < 0.001**) indicate that the educational intervention was effective in enhancing diabetic foot care awareness and promoting appropriate self-care behaviors. These results support the effectiveness of structured nurse-led educational programs in preventing diabetic foot complications at the community level.

Discussion

The present study demonstrated a statistically significant improvement in both knowledge and practice following foot care instruction. The mean knowledge score increased by approximately 80%, while practice scores improved substantially after the educational intervention.

These findings are consistent with previous community-based educational studies that reported significant improvements in diabetic foot knowledge and self-care practices after structured education. Similar positive outcomes have been documented in nursing and community health research, emphasizing that patient education is a cost-effective strategy to prevent diabetic foot complications.

The association between educational status and post-test knowledge indicates that literacy enhances the effectiveness of educational interventions. Likewise, patients with a longer duration of diabetes and previous exposure to foot care information demonstrated better post-test scores.

Conclusion

The study concludes that structured foot care instruction is highly effective in improving the knowledge and preventive foot care practices of diabetic patients residing in the community. Educational interventions empower patients to adopt appropriate self-care behaviors, thereby reducing the incidence of diabetic foot ulcers, infections, hospitalization, and lower limb amputations.

Routine foot care education should be integrated into community diabetes management programs to improve long-term health outcomes.

Recommendations

- Conduct multicenter studies with larger sample sizes.
- Evaluate long-term retention of foot care practices.
- Compare different educational methods such as video-assisted teaching and mobile health interventions.
- Develop nurse-led community foot care clinics.
- Conduct randomized controlled trials to strengthen the evidence.

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