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St. Paul's Hospital Millennium Medical College

**KNOWLEDGE, ATTITUDES, AND PRACTICES OF HEALTHCARE
PROFESSIONALS REGARDING DIABETIC FOOT ULCER
MANAGEMENT AT SPHMMC, ADDIS ABABA, ETHIOPIA**

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Addis Ababa, Ethiopia

February, 2025



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MANAGEMENT AT SPHMMC, ADDIS ABABA, ETHIOPIA**

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Research Project Submission Template

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Acronym/ Abbreviations

CI: Confidence Interval

DM: Diabetes Mellitus

DUF: Diabetic Foot

HBOT: Hyperbaric Oxygen Therapy

IDF: International Diabetes Federation

KAP: Knowledge, Attitudes, and Practices

OR: Odds Ratio

SPHMMC: St. Paul Hospital Millennium Medical College

Abstract

Background: Diabetes mellitus is a developing global health concern, with rising prevalence posing substantial challenges for healthcare systems worldwide. A significant consequence of diabetes is the increasing prevalence of diabetic foot ulcers, which often results from poor assessment and management practices. It is crucial to conduct thorough evaluations of the knowledge, attitudes, and practices (KAP) of healthcare practitioners regarding diabetic foot ulcer management in urban areas of Ethiopia to address these challenges effectively

Objective: This study aims to assess the knowledge, attitudes and Practice of Health care providers regarding the management of diabetic foot ulcers at SPHMMC, Addis Ababa Ethiopia.

Method: An institution based cross-sectional study was conducted among 420 health care professionals from December 30, 2024 up to February, 2025 G.C. A stratified sampling was employed to select study participants from the hospital. The data was collected online using Google form and then was exported to SPSS Version 25 for analysis. A binary logistic regression model was used to assess the relationship dependent and the independent variables. Variables with P-value < 0.25 was entered into multivariable binary logistic regression and finally P-value < 0.05 will be considered as statistically significant in this study.

Result: The study revealed that while 76.7% of healthcare providers had good knowledge of DFU management, 73.3% demonstrated poor practices. Additionally, 61% exhibited unfavorable attitudes. Limited training and the absence of standardized DFU guidelines (AOR = 0.279, 95% CI: 0.117–0.666) were key contributing factors. Institutional support, structured training (AOR = 0.292, 95% CI: 0.165–0.518), and peer discussions (AOR = 2.978, 95% CI: 1.491–5.949) were identified as critical in improving DFU management.

Conclusion: Gaps in the knowledge, attitudes, and practices of healthcare providers regarding diabetic foot ulcer (DFU) management at SPHMMC in Addis Ababa, Ethiopia, may adversely affect patient outcomes. Despite many providers demonstrating good knowledge, deficiencies in

attitudes and clinical practices reveal a disconnect between knowledge and care. Barriers such as limited access to guidelines and insufficient training were identified, while engagement in peer discussions and educational resources correlated with better knowledge. These findings highlight the urgent need for structured training programs, standardized guidelines, and enhanced institutional support to improve DFU management. Future research should focus on longitudinal studies and include patient perspectives to further enhance diabetic foot care

Keywords: Knowledge, attitude, practice, health, Addis Ababa, Ethiopia

1. Introduction

1.1 Background

Diabetes mellitus (DM) is a significant global health concern, with its rising prevalence posing substantial challenges for healthcare systems worldwide. According to the International Diabetes Federation, an estimated 537 million people had diabetes in 2021, with projections indicating an increase to 643 million by 2030 [1][2]. Among the chronic complications of diabetes, diabetic foot ulcers (DFUs) represent a serious issue, often leading to severe morbidity, increased healthcare costs, and even amputations if not managed properly. The burden of diabetic foot ulcers is particularly pronounced in low- and middle-income countries, where healthcare resources are limited and awareness of effective management strategies is low [3, 4].

Diabetic foot ulcers can result in serious outcomes such as infections, hospitalizations, and amputations, making proper management critical. Effective management in outpatient settings heavily relies on healthcare providers' knowledge, attitudes, and practices (KAP). A comprehensive review of KAP among these providers is essential to identify gaps and improve care delivery [5-7]. Research indicates that many healthcare professionals lack adequate training in managing diabetic foot ulcers. While they may understand the fundamentals of wound care, innovative therapies and interdisciplinary collaboration are often overlooked [2, 8, 9].

Cultural beliefs significantly influence attitudes toward diabetic foot ulcers, which in turn affect clinical practice and patient education. The management of diabetic foot ulcers varies widely across different healthcare systems. In low- and middle-income countries, inadequate training and resources lead to outdated treatment methods and a higher risk of ulcer development. In contrast, high-income countries typically have more advanced procedures and better access to modern care [10-12].

The treatment of diabetic foot ulcers is affected by systemic issues within the healthcare system and cultural beliefs. Some healthcare professionals may adopt a fatalistic view regarding the prognosis of these ulcers, believing that many cases will inevitably worsen despite treatment [13, 14]. Additionally, the stigma associated with diabetes can hinder effective communication between patients and healthcare providers, resulting in poor patient engagement and inadequate education.

In Ethiopia, the prevalence of diabetic foot ulcers is increasing, highlighting the need for effective management to prevent severe complications such as infections, amputations, and increased mortality rates [18, 19]. The KAP of healthcare personnel significantly impacts the quality of care provided to patients with diabetic foot ulcers in outpatient settings. Many healthcare professionals in Ethiopia are consistently uninformed about the management of these ulcers. Although they may be familiar with the basics of diabetes and its complications, there are significant gaps in their knowledge regarding advanced wound care techniques, offloading strategies, and the importance of interdisciplinary approaches. Studies show that many healthcare professionals lack knowledge of evidence-based protocols for treating diabetic foot ulcers, leading to ineffective treatment and poor patient outcomes [20-23].

Healthcare delivery is greatly influenced by attitudes toward diabetic foot ulcer management. Cultural beliefs surrounding diabetes may lead some healthcare professionals to adopt a fatalistic outlook on the prognosis of diabetic foot ulcers, believing that many cases will progress to more serious complications despite available treatments [24, 25]. Furthermore, the stigma associated with diabetes can obstruct effective communication between healthcare providers and patients, resulting in inadequate patient education and low engagement in self-care practices.

To support a proactive approach to diabetic foot ulcer management, it is essential to improve the attitudes of healthcare professionals. In Ethiopian outpatient settings, practices for managing diabetic foot ulcers vary significantly. Urban facilities with better access to resources may implement standardized protocols, while others may not [19, 26, 27].

1.2 Statement of problem

Over 537 million adults worldwide suffer from diabetes mellitus, a chronic condition that is expected to affect 783 million by 2045, according to the International Diabetes Federation (IDF). Diabetic foot ulcers are among the most serious consequences of diabetes mellitus. They can result in infections, amputations, and higher mortality rates [28, 29]. According to estimates from the World Health Organization (WHO), 15% of people with diabetes will get a foot ulcer at some point in their lives, and 20% of these ulcers will result in amputation[3]. Diabetic foot ulcers have a significant financial impact, costing healthcare systems billions of dollars in treatment and administration each year [2, 30]. Healthcare professionals' knowledge, attitudes, and practices regarding the management of diabetic foot ulcers still differ significantly, even with the progress made in diabetes care. Inadequate training and awareness among healthcare personnel are leading to subpar patient outcomes, according to a comprehensive review published in the Journal of Diabetes Research. Given that proper diabetic foot ulcers therapy can greatly lower problems and enhance patients' quality of life, this difference is very alarming [31-33].

Africa has a terrible diabetes epidemic, with an estimated 19 million people suffering with the disease as of 2021 with that figure expected to climb sharply in the years to come [34]. According to the IDF, 134 million adults in Africa are predicted to have diabetes by 2045, indicating that the disease is becoming more common there at a startling rate. Diabetic foot ulcers are a serious health risk in this situation [19, 35]. According to studies, as many as 25% of Africans with diabetes may experience a foot ulcer at some point in their lives. The frequency of amputations brought on by diabetic foot ulcers is concerning high [36].

The continent's healthcare systems frequently lack funding and struggle with a variety of issues, such as poor provider education and restricted access to specialized care. In order to increase healthcare personnel' knowledge and proficiency in managing diabetic foot care, the WHO highlights the necessity of better education and training programs and interventions [37, 38].

As of 2021, there will be about 3 million diabetic diagnoses in Ethiopia due to the country's escalating diabetes prevalence. If current trends continue, the Ethiopian Diabetes Association projects that this number might quadruple by 2030 [20, 39]. Up to 25% of people with diabetes are found to have diabetic foot ulcers, which significantly increases morbidity and death [40]. The Ethiopian health system has many obstacles to overcome, such as insufficient funding, poor provider training, and a dearth of established procedures for handling diabetic foot ulcers. Merely 40% of healthcare providers in Addis Ababa showed sufficient understanding about the management and prevention of diabetic foot ulcers, according to a research done there [20, 41]. The results showed that a lot of healthcare workers had misconceptions regarding diabetic foot ulcers, which led to worse than ideal patient treatment. Moreover, only thirty percent of healthcare professionals stated that they routinely monitor patients for foot issues at routine diabetic check- ups [42, 43]. Through initiatives like the National Diabetes Control Program, the Ethiopian government has made progress in treating non-communicable diseases; yet, gaps in healthcare personnel' knowledge about managing diabetic foot ulcers still exist. Patients are at risk for serious problems as a result of the lack of standardized training programs and resources, which have hampered effective care measures. However, the lack of standardized training programs and resources within urban healthcare settings can lead to significant challenges, often resulting in outdated or insufficient methods of care. It is crucial to conduct thorough evaluations of the knowledge, attitudes, and practices (KAP) of healthcare practitioners regarding diabetic foot ulcer management in Ethiopia, specifically in urban settings. Identifying these knowledge gaps can help design tailored training programs that enhance clinical skills and improve adherence to best practices. This study aims to assess the knowledge, attitudes, and practices of healthcare professionals regarding

the management of diabetic foot ulcers in the outpatient setting at SPHMMC, Addis Ababa, Ethiopia

1.3 Significance of study

Given the increasing global incidence of diabetes, it is critical to comprehend the strategies used by medical experts to manage diabetic foot ulcers. Effective management can help decrease the prevalence of complications such as infections and amputations, improving patient outcomes and lowering medical expenses associated with severe diabetic complications. This study intends to identify gaps in the knowledge, attitudes, and practices of healthcare professionals regarding diabetic foot ulcers, which can inform targeted training interventions that enable providers to deliver evidence-based care.

By focusing on the competencies of healthcare professionals in an outpatient setting at St. Paul's Hospital Millennium Medical College (SPHMMC) in Addis Ababa, this study differs from previous research. It identifies critical knowledge and practice gaps that could enhance treatment protocols. Furthermore, it incorporates contextual factors unique to Ethiopia, such as cultural beliefs about diabetes and healthcare access, providing a more comprehensive understanding of local dynamics affecting healthcare delivery. This approach increases the applicability of findings to the Ethiopian healthcare system and offers insights for designing tailored training programs and policy measures aimed at improving diabetic foot care.

Additionally, the outcomes of this study will assist policymakers in devising strategies, including guidelines, protocols, training initiatives, and quality improvement projects, ultimately facilitating better resource allocation. This research may also serve as a foundation for further studies on the subject, contributing to the broader discourse on diabetes care in resource-limited settings. By addressing the essential elements impacting healthcare providers' behaviors, this study aims to foster a more proactive approach to diabetic foot care, thereby improving the overall quality of life for individuals with diabetes.

2. Literature review

One major consequence of diabetes mellitus is diabetic foot ulcers (DFUs), which can increase morbidity, raise the risk of amputation, and increase healthcare expenses. Improving patient outcomes requires effective DFU treatment. The objective of this literature review is to evaluate the state of knowledge, attitudes, and practices (KAP) among healthcare providers about DFU management on a global scale [44-47]. Diabetic foot ulcers (DFUs) are a major public health concern worldwide, impacting millions of diabetics. DFUs can cause serious complications such as infections and amputations, with a five-year mortality rate of up to 50%. Management of diabetic foot ulcers is critical not just for improving patient outcomes but also for lowering healthcare expenditures associated with treating complications [50,51].

Diabetes is becoming more common in Africa, with the IDF claiming that over 24 million adults on the continent have the disease. DFU rates in African countries range from 4% to 20%, depending on the location, and many healthcare providers lack the necessary expertise and resources to manage these cases properly[52, 53]. Socioeconomic reasons, restricted access to healthcare services, and a lack of information all contribute to the difficulties that healthcare providers confront when managing diabetic foot ulcers[54, 55]. The problem is aggravated by a lack of standardized methods and a need for improved DFU prevention and treatment education for both healthcare personnel and patients [56].

Locally in Ethiopia, the situation with diabetic foot ulcers is particularly worrying. According to one study, the prevalence of DFUs among diabetics in Ethiopia is between 10% and 30% [57]. Poor glycemic management, restricted access to specialized care, and a lack of knowledge about foot care all contribute to the problem [58, 59]. Furthermore, healthcare personnel frequently claim a lack of expertise and training in the management of DFUs, limiting the effectiveness of treatment. Addressing these gaps through focused education and resource allocation is critical to improving diabetic patient outcomes and lowering the incidence of foot ulcers in Ethiopia.

2.1 Knowledge of Healthcare Providers towards diabetic foot ulcer management

According to an Indian study, only 60% of medical professionals were sufficiently informed about the risk factors connected to DFUs. When comparing specialists to general practitioners, the odds ratio (OR) for having appropriate knowledge was found to be 2.5 (95% CI: 1.5-4.2), suggesting that specialized training considerably improves knowledge [45].

By comparison, a survey conducted in the United Kingdom revealed that 75% of healthcare practitioners understood the significance of early intervention in the management of DFU (OR = 3.0, 95% CI: 1.8-5.0). The necessity for focused educational interventions and regional differences in knowledge levels are highlighted by this disparity [46].

200 healthcare professionals' understanding of DFUs was evaluated in a Nigerian study. It was discovered that just 48% of respondents knew enough about risk factors and mitigation techniques (OR = 1.5, 95% CI: 1.2-2.0) [48]. Comparably, according to a survey conducted in South Africa, 55% of practitioners showed that they knew enough about DFU management procedures (OR = 1.8, 95% CI: 1.3-2.5) [49]. Conversely, a study conducted in Kenya found that 70% of medical professionals understood the value of early identification and intervention (OR = 2.5, 95% CI: 1.5- 4.0) [50].

Research by Abebe et al. (2020): Of the 150 healthcare professionals examined in Addis Ababa, only 55% were found to have sufficient understanding regarding DFUs. Those who got formal training on diabetes care had an odds ratio of OR = 1.7 (95% CI: 1.2-2.5) for having enough knowledge when compared to those who did not [20].

According to research done in Gondar, 62% of healthcare professionals showed that they knew enough about the risk factors connected to DFUs. For individuals with five years or more of experience, the OR was OR = 2.3 (95% CI: 1.4-3.7) [51].

Of 200 medical professionals from different areas, just half understood how important it was for diabetes patients to have frequent foot exams. There was a 3.0 (95% CI: 1.8-4.8) odds ratio for awareness among those who attended diabetes workshops [52].

2.2 Attitude towards DFU management among health care provider

Attitudes have a big impact on the caliber of care given. According to a Brazilian study, 82% of medical professionals thought that patient education is essential to avoiding DFUs (OR = 4.0, 95% CI: 2.2-7.3). But only 45% of respondents said they frequently offered this kind of instruction during consultations [53].

An Australian study revealed a different picture: whereas 90% of healthcare professionals said they were confident in their ability to manage DFUs, only 55% followed the established clinical standards (OR = 2.0, 95% CI: 1.2-3.3). This highlights disconnect between belief and behavior and implies that good attitudes do not always convert into behavior[54].

Clinical practices are highly impacted by attitudes. According to a cross-sectional study conducted in Ghana, 80% of medical professionals thought that patient education was essential to reducing DFUs (OR = 3.0, 95% CI: 1.8-4.9). But only 55% said they routinely gave patients education during visits [55].

According to a survey conducted in Uganda, only 60% of healthcare practitioners followed clinical recommendations, even though 75% of them felt confident handling DFUs (OR = 2.0, 95% CI: 1.3-3.1). This reveals a discrepancy between idealized beliefs and practical application [56].

Research by Fenta et al. (2020): According to this study, 78% of healthcare professionals thought that patient education was crucial to avoiding DFUs (OR = 2.5, 95% CI: 1.6-3.9). Only 60%, however, stated that they had regular conversations with their patients about foot care [57].

According to a Bahir Dar study, only 50% of physicians regularly followed clinical

standards, even though 70% of them felt confident handling DFUs (OR = 1.8, 95% CI: 1.2-2.6) [58].

2.3 Practices in DFU Management among health care providers

Practically speaking, a cross-sectional study conducted in Nigeria revealed that only 50% of medical professionals examined diabetic patients' feet on a frequent basis (OR = 1.5, 95% CI: 1.0- 2.2). On the other hand, a Canadian study found that 78% of participants adhered to foot care guidelines (OR = 3.5, 95% CI: 2.0-6.2) [48].

Effective DFU treatment is hampered by a number of obstacles worldwide. A qualitative study conducted in South Africa found that the main barriers were a lack of resources and inadequate training (OR = 4.5, 95% CI: 2.5-8.0). Comparably, structural problems with healthcare systems, such as inadequate interdisciplinary teamwork, were revealed by a survey conducted in Eastern Europe (OR = 3.2, 95% CI: 1.8-5.6) [44].

Effective DFU administration requires both positive attitudes and the practical use of knowledge. Just 40% of medical professionals in Tanzania conducted routine foot exams on patients with diabetes (OR = 1.6, 95% CI: 1.1-2.4). However, according to a study conducted in Ethiopia, 65% of healthcare professionals followed the guidelines for taking care of their feet (OR = 2.7, 95% CI: 1.6-4.5) [59]. An extensive analysis conducted across several African nations revealed that healthcare practitioners' average adherence to foot care methods was just 50% (OR = 2.0, 95% CI: 1.5-2.7) [41].

To improve DFU management, obstacles must be identified. Lack of resources and insufficient training were shown to be major barriers in a qualitative study conducted in Zambia (OR = 4.5, 95% CI: 2.8-7.0). Moreover, systemic problems in Malawian healthcare systems were brought to light by a study (OR = 3.0, 95% CI: 1.8-4.9), one of which was inadequate interdisciplinary collaboration [60].

In a study only 45% of medical professionals examined diabetic patients' feet on a frequent basis, according to this study (OR = 1.9, 95% CI: 1.2-3.0) [61]. According to a survey conducted in Addis Ababa among 180 healthcare practitioners, the percentage of respondents adhering to the suggested foot care methods was 55% (OR = 2.0, 95% CI: 1.3-3.2) [20]. Only 40% of providers appropriately maintained DFUs that were already in place in accordance with conventional guidelines, according to a study by Hailu et al. (OR = 1.5, 95% CI: 1.1-2.0) [52].

Inadequate training and a lack of resources were shown to be major barriers to successful DFU management in a qualitative study conducted by Yared et al. (2020) (OR = 4.0, 95% CI: 2.5- 6.4)[62]. A study conducted in 2021 by Gebremedhin et al. revealed systemic problems in healthcare settings, such as a lack of interdisciplinary collaboration and insufficient follow-up treatment (OR = 3.5, 95% CI: 2.0-6.0) [41].

2.4 Conceptual Framework

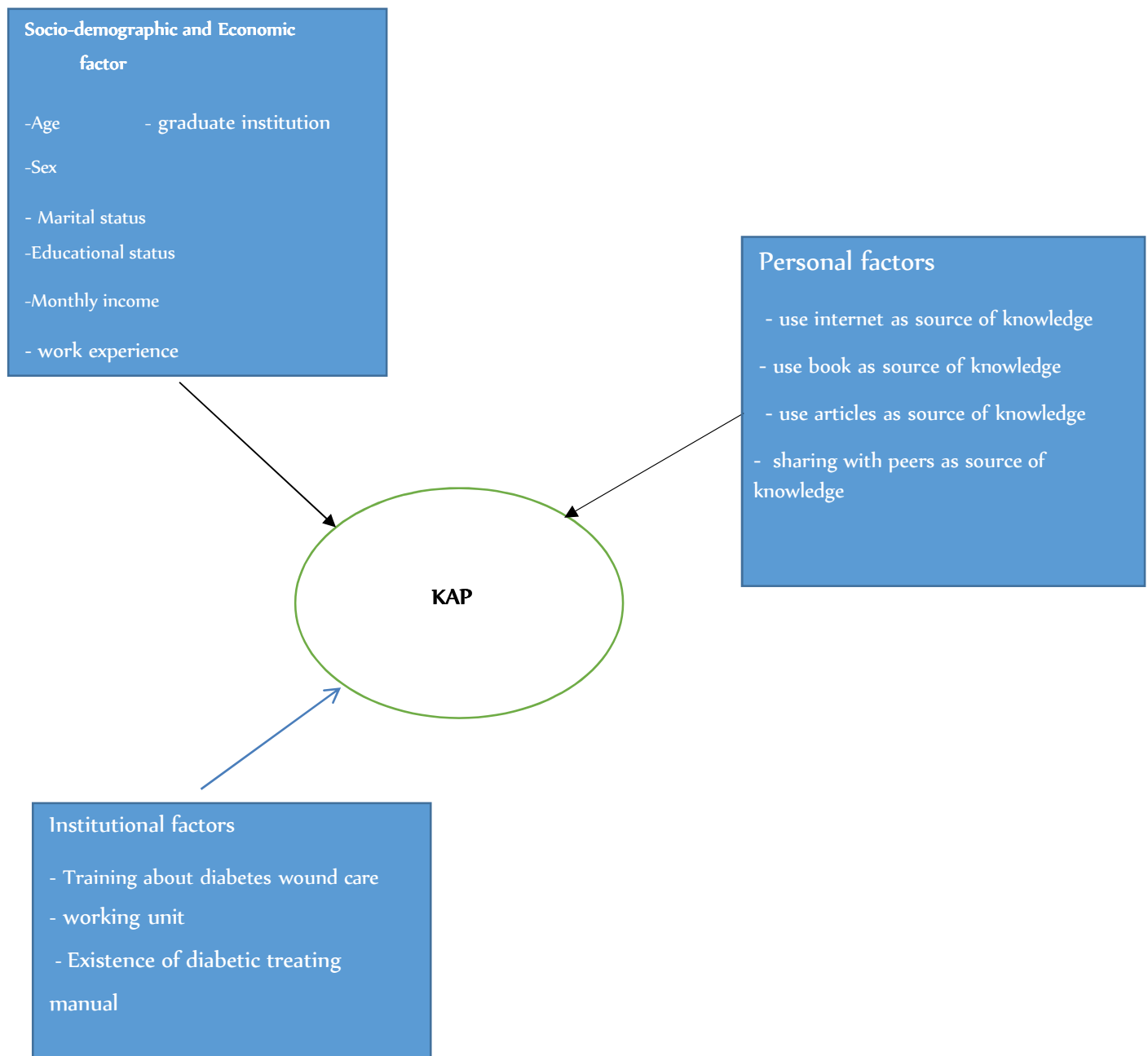


Figure 1 : Conceptual framework of factors associated with KAP of health care providers regarding the management of diabetic foot ulcers [21, 52, 63]

3. Objective

3.1 General Objective

To assess the knowledge, attitudes and Practice of Health care providers regarding the management of diabetic foot ulcers in the outpatient setting at SPHMMC, Addis Ababa Ethiopia, 2024, G.C.

3.2 Specific Objective

- ✓ To determine the level of knowledge, attitudes and Practice of Health care providers regarding the management of diabetic foot ulcers at SPHMMC, Addis Ababa Ethiopia, 2024, G.C.
- ✓ To identify factors associated with level of knowledge, attitudes and Practice of Health care providers regarding the management of diabetic foot ulcers at SPHMMC, Addis Ababa Ethiopia, 2024, G.C.

4. Methods

4.1 Study area

The site of the study was conducted at Saint Paul Millennium Medical College. The Gullele sub-city of Addis Ababa is home to SPHMMC. It's an important referral hospital as well as one of the best medical schools in Ethiopia. The medical facility was established in 1907. The organization employs more than 2800 clinical, academic, administrative, public health professionals and support staff members who teach medical, nursing students, and public health students, conduct basic and applied research, and treat patients who are referred from all across the nation. Over 700 inpatient beds are available at the college, and 1200 emergency and outpatient patients are seen there each day on average.

4.2 Study design and period

An institution-based cross sectional study was conducted from December 2024 up to February, 2025 G.C.

4.3 Population

4.3.1 Source population

All healthcare providers involved in the direct patient management at the outpatient setting in the hospitals, Addis Ababa Ethiopia.

4.3.2 Study population

All randomly selected health care providers who have involvement in direct patient management, at SPHMMC, Addis Ababa Ethiopia

4.4 Inclusion and exclusion criteria

4.4.1 Inclusion criteria.

- Healthcare providers who have involvement in direct patient management, at SPHMMC
- Providers who have been involved in the management of diabetic foot ulcers within the past year

4.4.2. Exclusion criteria.

➤ Healthcare providers on leave or not available during the study period.
Providers who do not have direct involvement in diabetic foot ulcer management

4.5 Sample size determination and sampling technique

4.5.1 Sample size

The minimum sample size is determined using a single population proportion formula in open Epi info, Version 7, with the assumptions of 54.4 % of the overall knowledge of health care providers a study conducted in Bahirdar, Ethiopia [21] which give as sample size of

$$n = (Z \alpha/2)^2 * \frac{P(1-P)}{(W)^2} = (1.96)^2 (0.544*0.456) = 3.84*0.248/0.0025 = 381 \dots\dots\dots 1$$

Where n = the desirable sample size, Z ($\alpha/2$) = the level of significance (1.96) at 95% C.I, W= acceptable marginal error = 0.05, adding the 10% non-response rate make the final sample size 420.

4.5.2 Sample size determination for second objective

Double population proportion formula was used to determine the sample size for factors associated towards knowledge and attitude knowledge, attitudes and Practice of Health care providers regarding the management of diabetic foot ulcers by using the Statcalc of Epi Info statistical software version 7 with the following assumptions:

- Confidence level = 95%
- Power = 80%
- The ratio of unexposed to exposed almost equivalent to 1

Table 1 Sample size determination for second objective of knowledge, attitudes and Practice of Health care providers regarding the management of diabetic foot ulcers in the outpatient setting at SPHMMC, Addis Ababa Ethiopia, 2024, G.C.

Factors		AOR	*FSS	Authors
Graduate institution	Outcomes in unexposed = 5.4 %	3.05	360	[21]
Age in years	Outcomes in unexposed = 51.4%	1.98	308	

*AOR- Adjusted odds ratio *FSS- Final Sample Size

Generally, sample sizes were calculated for the first and the second objectives and the largest sample size is found to be 381 from the first objective which give us final sample size of **420**.

4.5.3 Sampling technique

From the hospital's human resources department, a detailed roster of medical professionals employed in the outpatient division was acquired. The sample window for the investigation was this list. Once the necessary sample size was divided by the entire number of healthcare providers, the k interval is found to be six. Using the lottery method, the first participant was chosen, and until the required sample size is reached, every sixth healthcare professional was chosen.

4.6 Variables of study

4.6.1 Dependent Variable

- KAP

4.6.2 Independent variable

- Socio-Demographic characteristics (age, gender, education level, marital status, work experience, type profession, monthly income, graduate institution, learning program, level of qualification)

- Institutional factors (Advice on diabetic foot care , training about diabetes wound care, working unit, existence of diabetic treating manual)
- Personal factors (use internet as source of knowledge, use book as source of knowledge, use articles as source of knowledge, sharing with peers as source of knowledge)

4.7 Data collection tools and procedure

Self-administered questionnaire in English version was developed from based on a review of several validated literature sources, including Abate, T.W., et al. 2020 and Bilal, M., et al. 2018 [21, 63]. There are three sections to the questionnaire. First and second section includes institutional aspects and socio demographic characteristics. The knowledge portion included 15 items that will address descriptions, risk factors, and diabetic ulcer care. For every question, there are three options: "Yes," "No," and "I don't know." Here's how the score criteria was applied, correct answers will receive a score of 1, while questions marked "I do not know" receive a score of zero. Using the findings the knowledge was divided into two groups, a mean score was produced. Healthcare personnel will be considered to have good knowledge of diabetic foot care if their knowledge score will be at least as high as the mean. Poor knowledge, on the other hand, was defined as having a score that was below the knowledge mean.

The fourth section of the questionnaire was examining the attitudes of healthcare professionals regarding the management of diabetic feet. 10 items made up this section, and they was taken from the different literatures [47, 52, 63]. The main topics was discussed in this part are the perception of danger associated with diabetic foot ulcers, their clinical importance, and the interest that healthcare professionals do have in diabetic foot care. For this part, a switch to the 5-point Likert scale will be made. Comparing the likert system to a multiple-choice style with binary responses allows for a more comprehensive assessment of attitudes. The data was collected using online Google format.

4.8 Data quality assurance

This questionnaire which is developed in English is translated to Amharic and back to in English to check its consistency by language expert. Before the actual data collection, pre-testing was done in 5% of selected health care professionals at Black lion Hospital. Accordingly, all the necessary modifications and adjustments was done before implementation in the main study. The one-day training will be given to the data collectors and supervisor on the aim of the research, the way of data collection and ethical consideration during data collection. To ensure its completeness and consistency, each data was checked by the supervisor and researcher in daily base to maintain the quality of the data.

4.9 Operational definition

Knowledge: It had fifteen items that included descriptions, risk factors, and diabetic ulcer treatment. For every question, there were three options: "Yes," "No," and "I don't know." Using the findings and the divided knowledge into two groups, a mean score was produced. Healthcare practitioners were considered to have good understanding of diabetic foot care if their knowledge score was at least as high as the mean. Poor knowledge, on the other hand, was defined as having a score that was below the knowledge mean [21].

Attitude: There were ten questions in this section, each with a 5-point scoring system. Consequently, 10 and 50 are the lowest and highest attainable total scores. Positive attitudes will be identified using the median score, favorable attitude = subject score $\geq$ median score, unfavorable attitude = subject score < median score [52].

Practice: There are twelve items in this part that can only be answered with a Yes or No. The items evaluate the ways in which healthcare providers educate their patients about changing their lifestyles and caring for their diabetic feet [47].

Healthcare Professionals: In this study, healthcare providers refer to professionals involved in the management of diabetic foot ulcers, including

physicians, nurses, and diabetes educators who deliver direct care and education to patients in outpatient settings.

4.10 Data processing and analysis

At the beginning of the analysis the summation of knowledge and attitude scale was made. Then the variable was recoded and dichotomized. Descriptive statics will be used to illustrate the means, standard deviation and frequency of study variables. Bivariate analysis was computed, and variables with p-value less than or equal to $p \leq 0.25$ was fit in to multivariable logistic regression model. Odds ratio (OR) with 95% confidence interval was used to determine the association between dependent and independent variables. P-values less than or equal to 0.05 was considered as statistical significant.

To check model fitness, the Hosmer-Lemeshow test was performed, assessing how well the model predicted outcomes compared to actual observations.

Multicollinearity effects were evaluated using Variance Inflation Factor (VIF) values; a VIF greater than 10 indicated problematic multicollinearity. If multicollinearity was detected, variables with high correlations were considered for removal or adjustment in the model.

4.11 Ethical considerations

Ethical clearance was obtained from ethical the review committee of the SPMMC, and as well as permission letter was obtained from the hospital medical director. Before data collection, the purpose and importance of the study was well explained to each study participant and the privacy, secrecy and wellbeing of individuals involved in the research was protected. For obscurity, informed written consent obtained and participant's name was not be used at the time of data collection and all other personnel information kept entirely obscure and confidentiality was assured throughout the study period.

4.12 Dissemination of the result

The report of this study first will be submitted and presented to SPMMC, and then

the copies of the report will be given to SPMMC. Attempt will be made to present on national and international conference and workshops. Besides, efforts will be taken to publish on peer-reviewed journal.

5. Result

5.1 socio demographic characteristics of the participants

A total of 420 respondents participated in the study, resulting in a response rate of 100%. Among them, 256 (61%) were male. The mean age of the respondents was 29 years (SD = 2.77), ranging from 24 to 35 years. A little over half, 231 (55%), were married.

The majority, 396 (94.3%), graduated from governmental institutions, and almost all (99%) pursued their studies in a regular program. Regarding professional background, 221 (52.6%) were medical doctors, while the remaining 199 (47.4%) were nurses. Among the doctors, 152 (36%) were residents, whereas 151 (36%) of the nurses held a BSc degree or higher. 77.9% of study participants had never received any training regarding management of diabetic foot care.

In terms of income, the majority, 242 (57.6%), earned a monthly salary between 6,000 and 10,000 ETB.

Table 2 Socio demographic characteristics of participants about management of diabetic Foot ulcers in the outpatient diabetic clinic setting at SPHMMC, May 2024 – February 2024 (N=420)

		Frequency	percent
Socio demographic and related variables			
Age	≤30	299	71.2%
	31-45	121	28.8%

Sex	Male	256	61.0%
	Female	164	39.0%
Marital status	Married	189	45.0%
	Single	231	55.0%
Graduate institution	Governmental	396	94.3%
	Private	24	5.7%
Learning program	Regular	416	99.0%
	Extension/ night	4	1.0%
Type of profession	Nurse	199	47.4%
	Medical doctor	221	52.6%

Level of doctor qualification	Intern	12	2.9%
	GP	50	11.9%
	Resident	151	36.0%
	Specialist	8	1.9%
Level of nurse qualification	Diploma	46	11.0%
	B.Sc. and above	153	36.0%
Training on diabetic wound care	Yes	93	22.1%
	No	327	77.9%

5.2 Institutional factors

From all participants only 22.1 % of the respondents ever had training on a diabetic wound care.

Three hundred 77.86% of the respondents answer that they have no diabetic foot ulcer preventive and treatment manual in the hospital. In terms of working unit 22.4% of the respondents work in Medical OPD followed by 21.7%, 16.7%, 16%, 9%, 5.7% works in Medical ward, surgical ward, Emergency, surgical OPD, Orthopedic ward respectively.

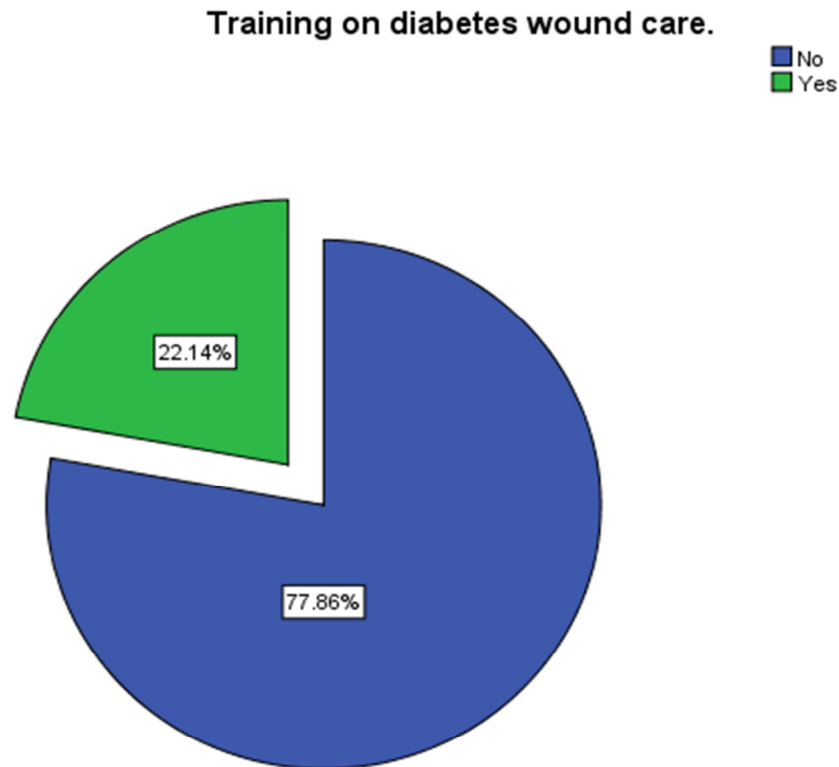


Figure 2 Institutional factors about management of diabetic Foot ulcers in the outpatient diabetic clinic setting at SPHMMC May 2024 – February 2024 (N=420)

5.3 Personal factors

The majority of respondents (77.4%) reported using the internet as a source of knowledge on the management of diabetic foot ulcers. Additionally, 66% of participants relied on books as a source of knowledge, while 50.7% referred to articles for information on diabetic foot ulcer management. Furthermore, 65% of respondents indicated that they share information with peers as a source of knowledge on this topic

5.4 Knowledge of Study Participants towards Diabetic Foot ulcer

In this study, a total of 420 participants included and the mean knowledge score was 5.94 ± 2.212 . The range of knowledge score obtained in this study was 1-15 out of maximum possible score of 15. Out of all the participants 322(76.7%) had good knowledge and 98(23.3%) had poor knowledge.

The overall knowledge assessment on diabetic foot ulcer (DFU) among participants reveals both strengths and significant gaps. Encouragingly, 83.3% correctly identified neuropathy as the predominant factor responsible for DFU, and 72.6% understood that sensory neuropathy leads to unnoticed skin damage, resulting in ulcer formation. However, misconceptions were evident in critical areas, particularly in differentiating neuropathic and ischemic ulcers, as 77.1% incorrectly believed ischemic ulcers are more painful than neuropathic ulcers, and 78.1% falsely assumed neuropathy could be ruled out if the foot skin was cool and pulses were absent. Moreover, while 71.0% recognized that limb ischemia increases the risk of amputation, a considerable 29.0% lacked this awareness, highlighting a need for further education.

Regarding wound healing, only 15.2% correctly identified that slough is not always a sign of infection, indicating a strong misconception regarding wound assessment. Furthermore, while 69.8% understood that osteomyelitis impairs healing, only 31.2% recognized that a pink wound bed is a positive sign of healing, with 68.8% incorrectly assuming it indicated poor progress. The importance of mechanical offloading was acknowledged by 63.1%, but the remaining 36.9% lacked awareness of this crucial intervention.

In terms of treatment approaches, hyperbaric oxygen therapy (HBOT) was widely misunderstood, with 71.0% incorrectly believing it is recommended even for well-perfused feet. Encouragingly, a majority (76.0%) correctly stated that infected, highly exuding wounds should be cleansed daily, and 69.3% recognized the effectiveness of iodine dressings for infected wounds. However, knowledge of hydrogel dressings was nearly evenly split, with 51.9% unaware of their role in rehydrating and controlling moisture in wounds.

Table 3 Knowledge of Study Participants towards Diabetic Foot ulcer in the outpatient diabetic clinic setting at SPHMMC May 2024 – February 2024 (N=420)

	Variables	Correct	Incorrect	I do not know
1	Neuropathy is the predominant factor responsible for diabetic ulcers (True)	350(83.3%)	55(13.1%)	15(3.6%)
2	Sensory neuropathy results in unnoticed skin damages, which lead to the formation of ulcers (True)	305(72.6%)	75(17.9%)	40(9.5%)
3	Autonomic neuropathy is associated with dry skin, which predisposes to ulcer formation (True)	251(59.8%)	139(33.1%)	30(7.1%)
4	Diabetic neuropathic ulcers are typically found on weight-bearing areas of the foot (True)	257(61.2%)	143(34.0%)	20(4.8%)
5	Diabetic ischemic ulcers are less painful than diabetic neuropathic ulcers (False)	96(22.9%)	269(64.0%)	55(13.1%)
6	Neuropathy can be excluded if the foot skin is cool and pulses are absent (False)	92(21.9%)	290(69.0%)	38(9.0%)
7	The risk of amputation is higher when diabetic foot ulcer is associated with limb ischemia (True)	298(71.0%)	48(11.4%)	74(17.6%)
8	Presence of slough is not an indication of infection in diabetic ulcers (False)	64(15.1%)	264(62.9%)	92(21.9%)
9	Presence of osteomyelitis impairs the healing of diabetic ulcers (True)	293(69.8%)	87(20.7%)	40(9.5%)

10	Wound healing progress is unsatisfactory if the wound bed appears pink (False)	131(31.2%)	251(59.8%)	38(9.0%)
11	Mechanical offloading should be advised to facilitate ulcer healing (True)	265(63.1%)	128(30.5%)	27(6.4%)
12	Hyperbaric oxygen therapy is recommended for ulcer healing even in a well perfused foot (False)	122(29.0%)	232(55.2%)	66(15.7%)
13	Infected, highly exuding wounds should be cleansed daily (True)	319(76.0%)	82(19.5%)	19(4.5%)
14	Iodine dressings are effective for wounds with clinical signs of infection (True)	291(69.3%)	83(19.8%)	46(11.0%)
15	Hydrogel dressings are useful to rehydrate the wound bed and control the moisture in wounds (True)	202(48.1%)	103(24.5%)	115(27.4%)

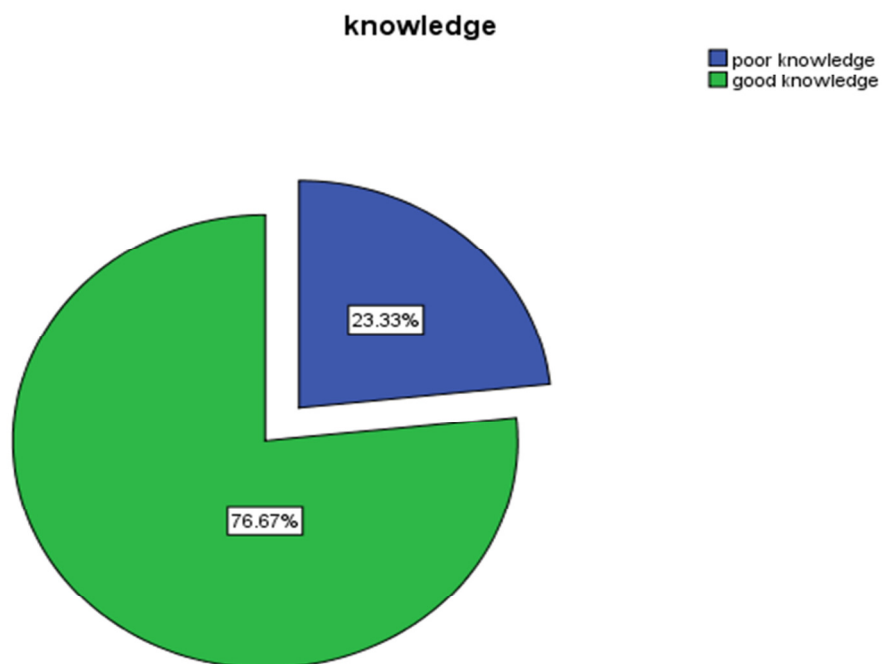


Figure 3 Knowledge of Study Participants towards Diabetic Foot ulcer in the outpatient diabetic clinic setting

5.5 Attitude of Study Participants towards Diabetic Foot ulcer

The analysis of healthcare providers' attitudes toward diabetic foot ulcer (DFU) management reveals that a significant proportion exhibits an unfavorable attitude. Out of 420 respondents, 256 (61.0%) demonstrated an unfavorable attitude, while only 164 (39.0%) had a favorable attitude. This indicates that the majority of healthcare providers may have concerns, misconceptions, or a lack of confidence regarding DFU management.

The attitude assessment regarding diabetic foot ulcers (DFUs) reveals a mix of perspectives among the respondents. A significant portion (50%) disagrees with the notion that ulcer treatment is more important than prevention, highlighting an awareness of the significance of proactive care. Additionally, 55% of respondents disagree with the statement that regular ulcer assessment is unnecessary, reinforcing the importance of continuous monitoring. However, there is some hesitancy regarding diabetic ulcer care, as 42.1% remain neutral on whether it is too time-consuming, and 46.7% consider it a low-priority task compared to other nursing responsibilities. Moreover, 43.3% of respondents are neutral about avoiding DFU care, while 42.4% disagree with avoiding it altogether, suggesting mixed confidence and willingness in managing these cases. A notable 55% agree that educating patients about ulcer care is essential, yet 55.5% also believe it is not their responsibility to prevent re-ulceration, indicating a gap in role perception. When it comes to pain management during ulcer care, 50.2% remain neutral about considering pain while cleaning wounds, and 45.7% express neutrality in their preference for DFU care. However, 65.7% of respondents find satisfaction in caring for diabetic ulcers, reflecting a positive outlook despite the challenges. Overall, while awareness of DFU prevention and management is present, there are notable concerns regarding responsibility, time constraints, and prioritization.

Table 4 Attitude of Study Participants towards Diabetic Foot ulcer in the outpatient diabetic clinic setting at SPHMMC May 2024 – February 2024 (N=420)

	Variables	Strongly Agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
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1	I think diabetic ulcer treatment is more important than ulcer prevention	48(11.4%)	16(3.8%)	34(8.1%)	210(50.0%)	112(26.7%)
2	I do not think it is necessary to assess diabetic ulcers regularly	28(6.7%)	8(1.9%)	85(20.2%)	231(55%)	68(16.2%)
3	Diabetic ulcer care is too time-consuming for me to carry out	0(0.00%)	12(2.9%)	177(42.1%)	175(41.7%)	56(13.3%)
4	In comparison with other areas of nursing care, diabetic ulcer care is a low priority task for me	0(0.0%)	20(4.8%)	120(28.6%)	84(20.0%)	196(46.7%)
5	If I have the opportunity, I would like to avoid caring for diabetic ulcers	0(0.0%)	32(7.6%)	182(43.3%)	178(42.4%)	28(6.7%)
6	I do not have time to advise each patient individually on how to look after their ulcers	4(1.0%)	8(1.9%)	126(30.0%)	51(12.1%)	231(55.0%)
7	It is not my responsibility to educate patients with diabetic ulcers on how to reduce re-ulceration	52(12.4%)	12(2.9%)	89(21.2%)	34(8.1%)	233(55.5%)
8	I cannot think about pain when cleaning diabetic ulcers	0(0.0%)	16(3.8%)	211(50.2%)	169(40.2%)	24(5.7%)
9	I do not like to care for diabetic ulcers in my Practice	20(4.8%)	20(4.8%)	192(45.7%)	144(34.3%)	44(10.5%)
10	I do not get satisfaction by caring for diabetic ulcers	40(9.5%)	8(1.9%)	60(14.3%)	276(65.7%)	36(8.6%)

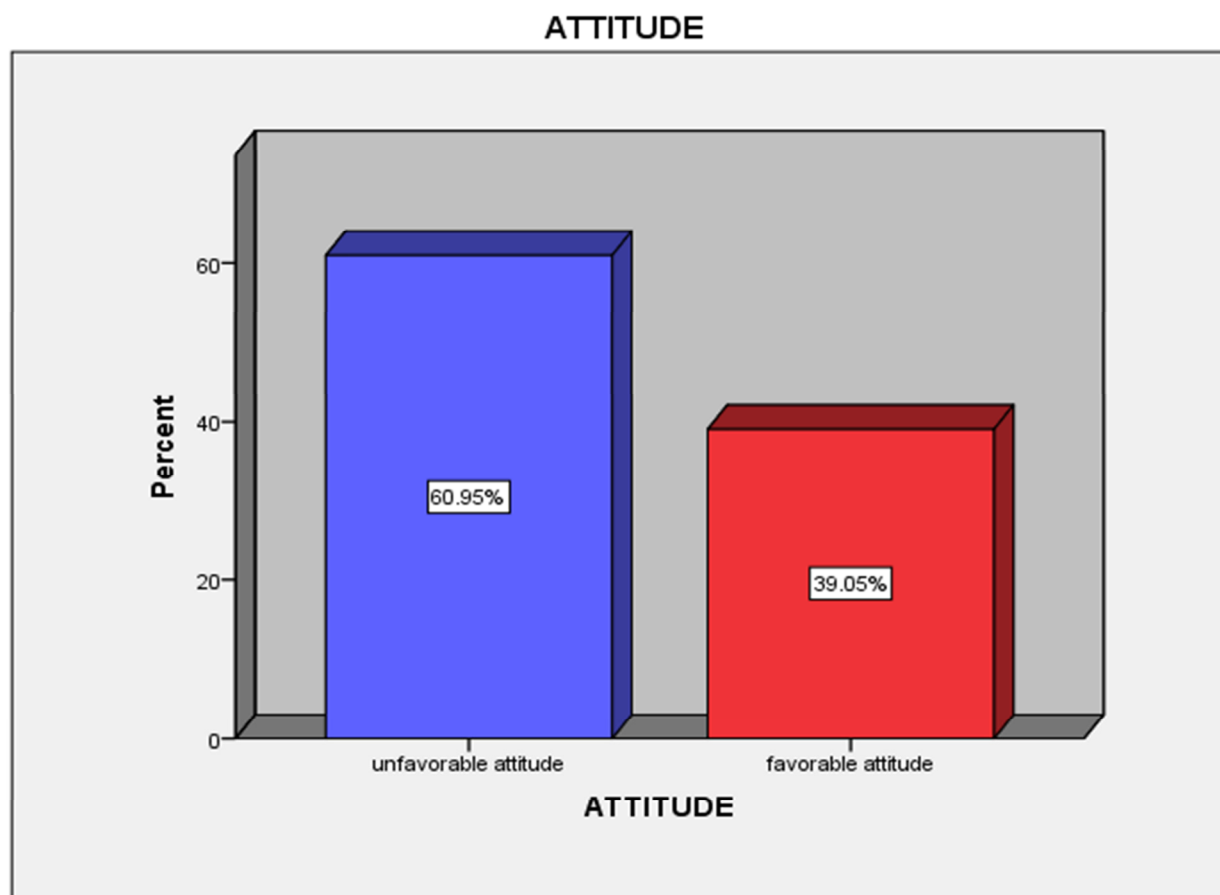


Figure 4 Knowledge of Study Participants towards Diabetic Foot ulcer in the outpatient diabetic clinic setting

5.6 Practice of Study Participants towards Diabetic Foot ulcer

The data analysis reveals that out of 420 respondents, 308 (73.3%) exhibited poor practice, whereas 112 (26.7%) demonstrated good practice. This indicates that the majority of participants fall into the poor practice category, with a smaller proportion adhering to good practice. The cumulative percentage confirms that all responses were accounted for, with 73.3% reaching the poor practice threshold and the remaining 26.7% classified under good practice.

The practice-related findings indicate that nearly half (48.8%) of the respondents have read diabetes management guidelines for healthcare providers, while a slightly higher percentage

(51.2%) has not. However, only 25.5% have attended a class on diabetic foot care, highlighting a gap in formal education on this subject. Additionally, only 30.5% of respondents record foot examinations in patient files, and 56.4% ask about foot status at each visit. A significant majority (87.6%) does not practice the 60-second screening tool for diabetic patients, and 36.7% do not check for loss of sensation in the feet. Alarming, 95.2% do not check patients' footwear at each visit, which is a critical aspect of preventing complications. On a positive note, 72.6% educate and encourage diabetic patients to quit smoking. More than half (57.6%) report lacking diabetic wound care experience, and a vast majority (81.4%) express a need for further training in diabetic foot care. Meanwhile, 73.6% check for foot deformities, calluses, infections, or ulcers at each visit, suggesting a relatively good practice in this area

Table 5 Practice of Study Participants towards Diabetic Foot ulcer in the outpatient diabetic clinic setting at SPHMMC May 2024 – February 2024 (N=420)

	Variables	Yes	No
1	Have you ever read any of the diabetes management guidelines for healthcare providers?	215(51.2%)	205(48.8%)
2	Have you ever attended a class on how to care for a diabetic patient's foot status?	313(74.5%)	107(25.5%)
3	I do record in the file the foot examination of diabetic patients attending my facility	292(69.5%)	128(30.5%)
4	I do ask patients about their foot status at each visit	183(43.6%)	237(56.4%)
5	I do practice a 60-s screening tool assessment for all my diabetic patients	368(87.6%)	52(12.4%)
6	I do check patient's feet for loss of sensation	154(36.7%)	266 (63.3%)
7	I do check diabetic patient's feet for any deformities, calluses, infections or ulcers at each visit	400(95.2%)	20(4.8%)

8	I do check diabetic patient's footwear at each visit	115(27.4%)	305(72.6%)
10	I educate and encourage diabetic patients on smoking cessation	178(42.4%)	242(57.6%)
11	Do you think you need training in diabetic foot care?	78(18.6%)	342(81.4%)
12	I do not have diabetic wound care experience	111(26.4%)	309(73.6%)

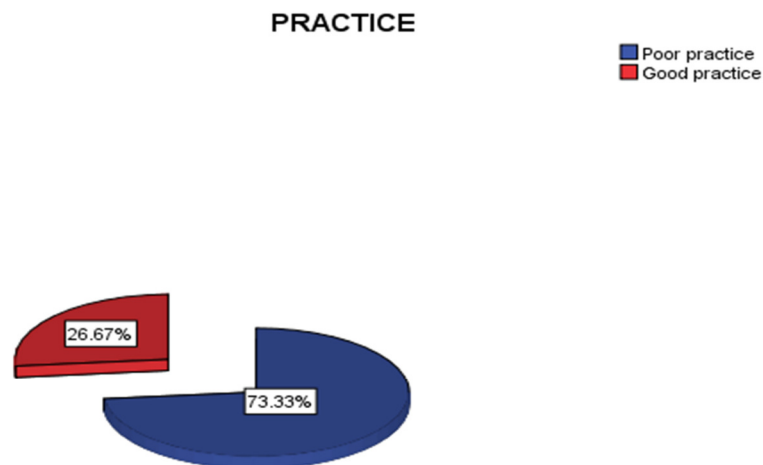


Figure 5 Practice of Study Participants towards Diabetic Foot ulcer in the outpatient diabetic clinic setting

5.7 Factors associated with knowledge of participants on diabetic foot ulcer

Initially, cross-tabulations were conducted for all variables to assess the association between dependent and independent variables. Then, bi-variable and multivariable analyses were

performed to determine the factors associated with healthcare providers' knowledge of diabetic foot ulcer (DFU) management.

In the bi-variable analysis, factors significantly associated with knowledge about DFU management included gender, work experience, type of profession, level of doctors' qualification, level of nurses' qualification, the existence of a DFU prevention and treatment manual, using books as a source of knowledge on DFU management, using articles as a source of knowledge on DFU management, sharing knowledge with peers, and working in a diabetic clinic or surgical outpatient department (OPD).

After controlling for confounding factors in the multivariable logistic regression analysis, the existence of a DFU prevention and treatment manual, work experience, using books as a source of knowledge, using articles as a source of knowledge, and sharing knowledge with peers were found to be significantly associated with knowledge of DFU management.

Specifically, Participants who had no manual on DFU treatment and prevention were less knowledgeable about DFU management (AOR = 0.279, 95% CI: 0.117–0.666), compared to who had manual.

Similarly, using articles as a source of knowledge was significantly associated with DFU management, participants who had no manual on DFU treatment and prevention were less knowledgeable about DFU management (AOR = 0.279, 95% CI: 0.117–0.666), compared to who had manual. Lastly, sharing knowledge with peers was another significant factor, Those who did not engage in peer discussions were three times more knowledgeable about DFU management (AOR = 2.978, 95% CI: 1.491–5.949), compared to who share with peers.

Table 6 bi-variable and multivariable binary logistic regression analysis for computed variables affecting knowledge of healthcare providers regarding management of diabetic foot ulcer, Addis Ababa, Ethiopia, (n=420).

Variables	Categories	Knowledge		COR (95% CI)	p- value	AOR (95% CI)
		Poor	Good			
Sex	Male	47(48.0%)	209(64.9%)	1		
	Female	51(52.0%)	113(35.1%)	0.49	0.61	0.77(0.28-2.11)
Age	<30	65(66.3%)	234(72.7%)	1		
	31-45	33(33.7%)	88(27.3%)	0.74	0.35	0.46(0.094-2.30)
Work experience	<2 year	19(19.4%)	97(30.1%)	1		
	2-5 year	59(60.2%)	205(63.7%)	0.68	0.013	0.251(0.084-0.748)
	>5 year	20(20.4%)	20(6.2%)	0.91	0.001	0.46 (0.391, 2.12)
Type of profession	Medical doctor	8(8.2%)	213(66.1%)	1		
	Nurse	90(91.8%)	109(33.9%)	0.045	0.1	0.27(0.099-0.77)
Level of doctors qualification	GP	1(1.4%)	50(15.5%)	1		
	Intern	0(0.00%)	12(3.7%)			
	Resident	8(8.2%)	143(44.4%)	0.3	0.4	0.63(0.225-1.81)

	Specialist	0(0.00%)	8(2.5%)			
Level of nurses qualification	B.Sc. and above	70(71.4%)	81(25.2%)	1		
	Diploma	20(20.4%)	26(8.1%)	1.12	0.9	0.47(0.15-1.46)
Training about diabetes wound care.	Yes	19(19.4%)	74(23.0%)	1		
	No	79(80.6%)	248(77.0%)	0.8	0.56	0.72(0.26-1.96)
existence of diabetic foot ulcer preventive and treatment manual	Yes	19(19.4%)	101(31.4%)	1		
	No	79(80.6%)	221(68.6%)	0.052	0.004	0.279(0.117-0.666)
Current working unit	Surgical OPD	8(8.2%)	30(9.3%)	1		
	Diabetic clinic	8(8.2%)	8(2.5%)	0.26	0.87	1.053(0.562-1.973)
	Medical OPD	26(26.5%)	68(21.1%)	2.26	0.044	0.46(0.094-2.30)
	Emergency	8(8.2%)	59(18.3%)	1.96	0.43	0.35(0.07-1.81)
	Surgical ward	8(8.2%)	30(9.3%)	1	0.114	1.959(1.970-4.685)
	Medical ward	28(28.6%)	63(19.6%)	0.6	0.32	
	Orthopedic ward	8(8.2%)	16(5%)	0.53	0.14	
	Others	0(0.0%)	20(6.2%)			
use internet as	Yes	72(73.5%)	253(78.6%)	1		

source of knowledge on management if diabetic foot ulcer	No	26(26.5%)	69(21.4%)	0.75	0.21	0.15(0.7-1.81)
use book as source of knowledge on management if diabetic foot ulcer	Yes	44(44.9%)	233(72.4%)	1		
	No	54(55.1%)	89(27.6%)	0.31	0.000	0.113(0.037-0.344)
use articles as source of knowledge on management if diabetic foot ulcer	Yes	8(8.2%)	205(63.7%)	1		
	No	90(91.8%)	117(36.3%)	0.05	0.000	14.488(3.844-54.60)
sharing with peers as source of knowledge	Yes	35(35.7%)	241(74.8%)	1		
	No	63(64.3%)	81(25.2%)	0.18	0.002	2.978(1.49-5.949)
*P value less than 0.05 were significant, 1 reference group						

5.8 Factors associated with Attitude of participants on diabetic foot ulcer

In the bi-variable analysis, factors that were significantly associated with attitude toward the management of diabetic foot ulcers (DFU) included age, type of profession, having training on DFU management, level of nursing qualification, the existence of a diabetic foot ulcer prevention and treatment manual, using books as a source of knowledge on DFU management, using articles as a source of knowledge on DFU management, and sharing knowledge with peers.

After controlling for confounding factors in the multivariable logistic regression analysis, having training on DFU management, using books as a source of knowledge, using articles as a source of knowledge, and sharing knowledge with peers were found to be significantly associated with a positive attitude toward DFU management.

Specifically, participants who reported having training on DFU management were 0.292 times more likely to have a favorable attitude toward DFU management (AOR = 0.292, 95% CI: 0.165–0.518). Additionally, using books as a source of knowledge was found to be a strong predictor of a positive attitude, as healthcare providers who used books were 21 times more likely to have a favorable attitude compared to those who did not (AOR = 21.079, 95% CI: 9.522–46.66).

Similarly, using articles as a source of knowledge was significantly associated with DFU management, with healthcare providers who used articles being 0.447 times more likely to have a good attitude (AOR = 0.447, 95% CI: 0.229–0.875). Finally, sharing knowledge with peers was also a significant predictor, as those who engaged in peer discussions were 0.543 times more likely to have a positive attitude toward DFU management (AOR = 0.543, 95% CI: 0.330–0.891).

Table 7 bi-variable and multivariable binary logistic regression analysis for computed variables affecting attitude of healthcare providers regarding management of diabetic foot ulcer, Addis Ababa, Ethiopia, (n=420).

Variables	Categories	Attitude		COR (95% CI)	p- value	AOR (95% CI)
		Poor	Good			
Sex	Male	152(59.4%)	104(63.4%)	1		
	Female	104(40.6%)	60(36.6%)	0.84	0.61	0.77(0.28-2.11)
Age	<30	192(75.0%)	107(65.2%)	1		
	31-45	64(25.0%)	57(34.8%)	1.59	0.35	0.46(0.094-2.30)
Work experience	<2 year	84(32.8%)	32(19.5%)	1		
	2-5 year	148(57.8%)	116(70.7%)	2.05	0.005	9.231(1.853-45.99)
	>5 year	24(9.4%)	16(9.8%)	1.75		
Type of profession	Medical doctor	125(48.8%)	95(58.5%)	1		
	Nurse	131(51.2%)	68(41.5%)	0.68	0.00	0.27(0.099-0.77)
Level of doctors qualification	GP	26(10.2%)	24(14.6%)	1		
	Intern	4(1.6%)	8(4.9%)	2.16	0.4	0.63(0.225-1.81)
	Resident	95(37.1%)	56(34.1%)	0.63	1.00	1.673(0.66-1.16)

	Specialist	0(0.00%)	8(4.9%)			
Level of nurses qualification	B.Sc. and above	111(43.4%)	40(24.4%)	1		
	Diploma	22(8.6%)	24(14.6%)	3.02	0.9	0.47(0.15-1.46)
Training about diabetes wound care.	Yes	69(27.0%)	24(14.6%)	1		
	No	187(73.0%)	140(85.4%)	2.15	0.000	0.292(0.165-0.518)
existence of diabetic foot ulcer preventive and treatment manual	Yes	68(26.6%)	52(31.7%)	1		
	No	188(73.4%)	112(68.3%)	0.77	0.87	0.88(0.18-4.2)
Current working unit	Surgical OPD	34(16.4%)	4(2.4%)	1		
	Diabetic clinic	12(4.7%)	4(2.4%)	2.8	0.4	0.63(0.225-1.81)
	Medical OPD	62(24.4%)	32(19.5%)	4.3	0.9	0.47(0.15-1.46)
	Emergency	47(18.4%)	20(12.5%)	0.23	0.56	0.72(0.26-1.96)
	Surgical ward	42(16.4%)	28(17.1%)	0.36		
	Medical ward	35(13.7%)	56(34.1%)	0.877	0.87	0.88(0.18-4.2)
	Orthopedic ward	12(4.7%)	12(57.3%)	0.54		
	Others	12(4.7%)	8(4.9%)	0.36		
use internet as	Yes	161(62.9%)	164(100%)	1		

source of knowledge on management if diabetic foot ulcer	No	95(37.1%)	0(0.00%)		0.23	0.97(0.87-1.01)
use book as source of knowledge on management if diabetic foot ulcer	Yes	129(50.4%)	148(90.2%)	1		
	No	127(49.6%)	16(9.8%)	0.10	0.000	21.07(9.522-46.66)
use articles as source of knowledge on management if diabetic foot ulcer	Yes	113(44.1%)	100(61.0%)	1		
	No	143(55.9%)	64(39.0%)	0.50	0.01	0.447(0.229-0.875)
sharing with peers as source of knowledge	Yes	184(71.9%)	92(56.1%)	1		
	No	72(28.1%)	72(43.9%)	2	0.01	0.543(0.330-0.891)
*P value less than 0.05 were significant, 1 reference group						

5.9 Factors associated with Practice of participants on diabetic foot ulcer

In the bi-variable analysis, factors significantly associated with the practice of diabetic foot ulcer (DFU) management included gender, graduation institution, type of profession, level of nurses' qualification, having training on DFU management, the existence of a DFU prevention and treatment manual, using the internet as a source of knowledge on DFU management, using books as a source of knowledge, using articles as a source of knowledge, sharing knowledge

with peers, and working in a diabetic clinic or surgical outpatient department (OPD).

After controlling for confounding factors in the multivariable logistic regression analysis, only gender and sharing knowledge with peers were found to be significantly associated with DFU management practice.

Specifically, participants who reported sharing knowledge with peers were three times more likely to have good practice in DFU management (AOR = 3.16, 95% CI: 1.716–5.820).

Additionally, this study revealed that being a female healthcare provider was associated with a 0.55 times higher likelihood of having good practice in DFU management (AOR = 0.55, 95% CI: 0.330–0.921).

Table 8 bi-variable and multivariable binary logistic regression analysis for computed variables affecting practice of healthcare providers regarding management of diabetic foot ulcer, Addis Ababa, Ethiopia, (n=420).

Variables	Categories	Practice		COR (95% CI)	p- value	AOR (95% CI)
		Poor	Good			
Sex	Male	204(66.2%)	52(46.4%)	1		
	Female	104(33.8%)	60(53.6%)	2.2	0.02	0.552(0.330-0.921)
Age	<30	219(71.1%)	80(71.4%)	1		
	31-45	89(28.9%)	32(28.6%)	0.98	0.35	0.46(0.094-2.30)
Work experience	<2 year	76(24.7%)	40(35.7%)	1		
	2-5 year	200(64.9%)	64(57.1%)	0.6		9.231(1.853-45.99)

	>5 year	32(10.4%)	8(7.1%)	0.09		
Type of profession	Medical doctor	193(62.7%)	28(25.0%)	1		
	Nurse	115(37.3%)	84(75.0%)	5.03		0.27(0.099-0.77)
Level of doctors qualification	GP	46(14.9%)	4(75.0%)	1		
	Intern	12(3.9%)	0(0.00%)		0.4	0.63(0.225-1.81)
	Resident	127(41.2%)	24(21.4%)	2.17		
	Specialist	8(2.6%)	0(0.00%)			
Level of nurses qualification	B.Sc. and above	83(26.9%)	68(60.7%)	1		
	Diploma	28(9.1%)	18(16.1%)	0.78	0.9	0.47(0.15-1.46)
Training about diabetes wound care.	Yes	77(25.0%)	16(14.3%)	1		
	No	231(75.0%)	96(85.7%)	2	0.51	0.72(0.26-1.96)
existence of diabetic foot ulcer preventive and treatment manual	Yes	104(33.8%)	16(14.3%)	1		
	No	204(66.2%)	96(85.7%)	3.05	0.7	0.88(0.18-4.2)
Current working unit	Surgical OPD	34(11.0%)	4(3.6%)	1		
	Diabetic clinic	8(2.6%)	8(7.1%)	8.5	0.204	0.45(0.788,3.039)
	Medical OPD	54(17.5%)	40(35.7%)	3.14	0.957	1.43(0.58-3.55)
	Emergency	55(17.9%)	12(10.7%)	0.9	0.54	0.2(0.06-0.65)
	Surgical ward	58(18.8%)	12(10.7%)	0.87	0.12	0.58(0.17-2.66)
	Medical ward	67(21.8%)	24(21.4%)	1.5	0.7	
	Orthopedic	16(5.2%)	8(7.1%)	2.12	1.00	

	ward					
	Others	16(5.2%)	4(3.6%)	1.06		
use internet as source of knowledge on management if diabetic foot ulcer	Yes	265(86.0%)	60(53.6%)	1		
	No	43(14.0%)	52(46.4%)	5.3	0.24	1.249(0.27-2.327)
use book as source of knowledge on management if diabetic foot ulcer	Yes	233(75.6%)	44(39.3%)	1		
	No	75(24.4%)	68(60.7%)	4.8	0.753	1.162(0.456-2.96)
use articles as source of knowledge on management if diabetic foot ulcer	Yes	185(60.1%)	28(25.0%)	1		
	No	123(39.9%)	84(75.0%)	4.51	0.000	3.16(1.71-5.82)
sharing with peers as source of knowledge	Yes	188(61.0%)	88(78.6%)	1		
	No	120(39.0%)	24(21.4%)	0.42	0.000	3.16(1.716-5.820)
*P value less than 0.05 were significant, 1 reference group						

Discussion

This study provides critical insights into the knowledge, attitudes, and practices (KAP) of healthcare providers regarding diabetic foot ulcer (DFU) management at SPHMMC in Addis Ababa. The findings reveal significant gaps that could adversely affect patient outcomes and underscore the need for targeted interventions.

Knowledge of Healthcare Providers

The study found that 76.7% of respondents possessed good knowledge of DFU management, while 23.3% had poor knowledge, with a mean knowledge score of 5.94 ± 2.212 out of 15. These results indicate a substantial proportion of healthcare providers lack comprehensive knowledge, which aligns with findings from studies in other regions. For instance, a study in the Sol Plaatje sub-district of South Africa reported that 58.1% of nurses were aware of national diabetic foot guidelines, but many were unfamiliar with essential assessment tools like the 10 g monofilament test (26). Similarly, research from Saudi Arabia found that only 63.4% of healthcare providers had adequate knowledge of DFU management, highlighting a persistent knowledge gap across different healthcare settings (35). These findings underscore the need for enhanced educational interventions tailored to healthcare providers' specific needs.

Attitudes toward DFU Management

A notable 61% of healthcare providers in this study exhibited unfavorable attitudes toward the management of diabetic foot ulcers (DFUs), which could negatively impact patient care. Factors such as a lack of training and limited access to educational resources were significantly associated with these attitudes. Comparatively, a study conducted at Hawassa Comprehensive Specialized Hospital in Ethiopia reported that while 79.2% of diabetic patients had a positive attitude toward DFU management, only 43.2% engaged in proper foot care practices (18). This discrepancy between attitudes and actual practices highlights the need for a deeper understanding of the factors influencing healthcare providers' behaviors.

In comparing these findings to those from India, where 85% of nurses recognized the importance of DFU management, it is concerning that only 47% adhered to the recommended clinical guidelines. This inconsistency between belief and action reinforces the idea that fostering positive attitudes alone is insufficient. The evidence suggests that practical reinforcement through hands-on training and robust institutional support is crucial to translating positive attitudes into effective patient management practices.

Practice of DFU Management

The current study revealed that 73.3% of healthcare providers demonstrated poor practices in DFU management, indicating a substantial gap between knowledge and practice. This issue has been similarly reported in multiple studies. In South Africa, research on nurses' DFU management practices highlighted deficiencies in the implementation of diabetic foot care protocols despite awareness of guidelines (26). A study from Nigeria reported that only 35.5% of healthcare providers regularly conducted foot examinations for diabetic patients, and 29% had never received formal training on DFU management (48). The findings from our study align with these international reports, reinforcing the need for structured training programs and institutional support to translate knowledge into practice effectively.

Institutional and Personal Factors Influencing DFU Management

Institutional support plays a pivotal role in effective DFU management. In this study, only 22.1% of healthcare providers had received formal training on diabetic wound care, and 71.9% reported the absence of a DFU prevention and treatment manual in their hospital. Similar challenges have been reported in other regions. In a study conducted in Pakistan, only 19% of healthcare providers had received structured training on DFU management, and the absence of standardized protocols was cited as a major barrier to effective care (10). Furthermore, the role of personal learning preferences was evident in our study, with 77.4% of respondents relying on the internet, 66% on books, and 50.7% on journal articles as sources of knowledge. Peer discussions also played a significant role, with 65% of respondents engaging in knowledge-sharing activities.

These findings align with studies emphasizing the importance of continuous professional development and accessible educational resources in enhancing DFU management.

Factors Associated with Knowledge of DFU Management

Multivariable logistic regression analysis identified several significant factors associated with higher knowledge levels regarding diabetic foot ulcer (DFU) management among healthcare providers. Specifically, access to a DFU prevention and treatment manual, utilization of books and articles as knowledge sources, and participation in peer discussions emerged as critical components. Participants with access to a DFU manual demonstrated enhanced knowledge about effective management practices, underscoring the importance of standardized guidelines in clinical settings.

Engagement in peer learning significantly enriched knowledge, with those participating in peer discussions being nearly three times more knowledgeable about DFU management. This finding emphasizes the value of collaborative learning environments, which allow healthcare providers to share experiences and best practices, thereby enhancing the overall quality of care delivered to patients.

These findings are consistent with research conducted in the United Kingdom, where access to clinical guidelines and active participation in peer discussions significantly improved nurses' knowledge of DFU management. Similarly, a study in the United States highlighted that ongoing education and collaborative learning environments positively influenced healthcare providers' competencies in managing diabetic foot ulcers. The evidence suggests that fostering a culture of continuous learning, through both formal resources and peer interaction, is essential for empowering healthcare providers to adopt effective DFU management practices

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Factors associated with Attitudes of DFU management

The findings related to healthcare providers' attitudes toward diabetic foot ulcer (DFU) management underscore the importance of training and educational resources. Participants who received training on DFU management exhibited significantly more favorable attitudes, highlighting the role of structured educational interventions. Additionally, using books as a knowledge source substantially increased the likelihood of a positive attitude, emphasizing the value of comprehensive materials. The positive influence of utilizing articles and engaging in peer discussions further reinforces the need for ongoing professional development and collaborative learning. These results suggest that enhancing access to training and fostering knowledge sharing can improve attitudes toward DFU management, ultimately benefiting patient care.

Factors associated with practice of DFU Management

The results concerning the practice of DFU management reveal significant associations with gender and peer knowledge sharing. Participants involved in peer discussions were three times more likely to demonstrate good practices, indicating the importance of collaborative communication among healthcare providers. Moreover, the finding that female healthcare providers were more likely to exhibit good practices may reflect broader sociocultural influences. These insights underline the necessity for interventions that promote knowledge sharing and create supportive environments, enhancing the quality of DFU management across healthcare settings

Limitation of the study

Despite its valuable findings, this study has several limitations that should be considered when interpreting the results:

1. Cross-Sectional Design – Since the study employs a cross-sectional design, it captures only a snapshot of healthcare providers' knowledge, attitudes, and practices at a specific point in time. This limits the ability to establish causality between associated factors and DFU management.

2. Self-Reported Data – The study relies on self-reported responses from healthcare providers, which may introduce social desirability bias. Participants might have provided responses they perceived as favorable rather than reflecting their actual knowledge or practices.
3. Single-Center Study – The study was conducted at a single healthcare facility (SPHMMC), which may limit the generalizability of the findings to other hospitals or regions with different healthcare systems, resources, and protocols.
4. Limited Objective Assessment of Practice – While the study assessed self-reported practices, direct observation of clinical practices was not conducted. This may lead to discrepancies between reported and actual behaviors in DFU management.
5. Potential Recall Bias – Participants were required to recall aspects of their training and clinical experiences, which could have introduced recall bias, affecting the accuracy of the responses.
6. Lack of Comparative Pre- and Post-Training Evaluation – The study does not include a pre- and post-training assessment to evaluate how educational interventions could improve knowledge, attitudes, and practices over time.
7. Exclusion of Patient Perspectives – The study focuses solely on healthcare providers, omitting patient perspectives on DFU management, which could provide a more comprehensive understanding of the challenges in DFU care.

Conclusions

This study assessed the knowledge, attitudes, and practices of healthcare providers regarding diabetic foot ulcer (DFU) management at SPHMMC, Addis Ababa, Ethiopia. The findings revealed significant gaps that could impact patient outcomes, emphasizing the need for targeted interventions to improve DFU care. While a considerable proportion of healthcare providers displayed good knowledge of DFU management, notable deficiencies persisted. Furthermore, a significant percentage of participants demonstrated poor practices, highlighting a significant knowledge-practice gap that could negatively impact patient care. Similar patterns have been reported in studies from South Africa, India, and Nigeria, underscoring the global challenge of ensuring evidence-based DFU management in clinical settings..

Institutional and personal factors played a critical role in shaping healthcare providers' competencies. Limited access to DFU guidelines, insufficient training, and a lack of structured education programs were identified as major barriers. Conversely, engagement in peer discussions, utilization of books and articles, and access to DFU prevention manuals were associated with higher knowledge levels. These findings align with international research, reinforcing the importance of continuous professional development and institutional support in improving DFU management.

To address these gaps, this study highlights the urgent need for expanding structured training programs, developing standardized DFU guidelines, encouraging peer learning, and strengthening institutional support. By implementing these strategies, healthcare facilities can

enhance the quality of DFU management, ultimately leading to better patient outcomes and reduced complications.

Future research should focus on longitudinal studies to assess the long-term impact of training interventions and include direct observations of clinical practice to provide a more comprehensive understanding of DFU management. Additionally, integrating patient perspectives could offer valuable insights into improving overall diabetic foot care.

Recommendation

For Healthcare Providers

1. Enhancing Training and Education Programs

- Implement regular, structured DFU training programs for healthcare providers, including doctors, nurses, and other relevant staff.
- Integrate DFU management into continuous professional development (CPD) programs and medical/nursing curricula.
- Conduct workshops and hands-on clinical training sessions focused on best practices in DFU prevention, assessment, and treatment.

2. Improving Clinical Practice and Resource Availability

- Ensure the availability of essential tools such as the 10 g monofilament test, Doppler devices, and wound care supplies.
- Develop multidisciplinary DFU care teams, including, endocrinologists, nurses, and wound care specialists, to enhance collaborative management.
- Implement regular audits and monitoring systems to assess compliance with DFU management protocols.

For Healthcare Administrators

1. Developing and Disseminating Standardized Guidelines

- Establish and distribute comprehensive DFU prevention and management guidelines tailored to the local healthcare context.
- Ensure easy access to DFU manuals and protocols within healthcare facilities to improve adherence to evidence-based practices.
- Encourage the adoption of international DFU management guidelines, adapting them to the Ethiopian healthcare system where necessary.

2. Strengthening Institutional Support

- Advocate for policy changes that prioritize DFU management as a critical aspect of diabetic care.
- Allocate funding for DFU-related training, research, and the procurement of necessary medical supplies.

- Establish DFU-focused outpatient clinics and wound care centers to improve patient access to specialized care.

For Policymakers

1. Promoting Positive Attitudes toward DFU Management

- Address misconceptions and negative perceptions about DFU management through targeted awareness campaigns.
- Strengthen the role of mentorship and leadership in fostering a culture of proactive DFU care.
- Encourage recognition and incentives for healthcare providers who demonstrate excellence in DFU management.

2. Encouraging Knowledge Sharing and Peer Learning

- Facilitate peer discussions, case conferences, and experience-sharing platforms among healthcare providers.
- Promote inter-professional collaboration to strengthen DFU knowledge and skills.
- Utilize digital platforms, such as online forums and webinars, to enhance knowledge exchange.

For Researchers

1. Future Research Directions

- Conduct longitudinal studies to evaluate the long-term impact of training and guideline implementation on DFU outcomes.
- Investigate patient-related factors affecting DFU prevention and treatment to develop holistic interventions.
- Explore innovative approaches, such as telemedicine and mobile health applications, to enhance DFU education and care delivery.

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Assurance of Principal Investigator

I, the undersigned, agree to accept all responsibilities for the scientific and ethical conduct of the research project. I will provide timely progress report to my advisor and seek the necessary advice and approval from my primary advisors in the course of the research. I will communicate timely to my advisors & all stakeholders involved in the study including any source of funding for this research.

Name of the student: _____

Signature: _____

Date: _____

Approval of the Primary Advisor

Name of the primary advisor: _____

Signature: _____

Date: _____

Approval of the Co-Advisor

Name of the primary advisor: _____

Signature: _____

Date: _____

Annex

Consent form

Hello, my name is Dr. BedeMariam Fekade a final year family medicine resident at SPMMC. I am doing a research with objective of Assessing the knowledge, attitudes and Practice of Health care providers regarding the management of diabetic Foot ulcers in the outpatient setting at SPHMMC, Addis Ababa Ethiopia. You are selected randomly and I would like you to answer the questions that are prepared for you and which will take 20-25 minutes of your time to fill. Your answers to these questions will remain confidential and your name will not be written on the questionnaire. You have the rights to withdraw from the study at any stage or to restrict the information you provide from being used as a part of the data analysis.

Do you agree to participate in the study? A. Yes -----

B. No ----- Thank you for participating in the study.

English version questionnaire

PART I. Socio demographic and economic data of participants.

S/N	Questions	Response	Code	Skip
101	Age (yrs.)			
102	Sex:	Male	1	
		Female	2	
103	What is your marital status?	Married	1	
		Single	2	
		Divorced	3	
		Widowed	4	

104	Graduate institution	Private	1	
		Government	2	
105	Learning program	regular	1	
		Extension/night	2	
106	Level of nurse qualification	Diploma	1	
		B.Sc. and above	2	
107	Type of profession	Nurse	1	
		Medical Doctor	2	
		Health Officer	3	
		others	4	
108	Level of doctor qualification	Specialist	1	
		Resident	2	
		GP	3	
		Intern	4	
109	Monthly income (ETB)			
110	Work experience in a year	_____		

PART II. Institutional factors

S/N	Questions	Response	Code	Skip
201	Training about diabetes wound care.	Yes	1	
		No	2	
202	existence of diabetic foot ulcer preventive and treatment manual	Yes	1	
		No	2	

203	Current working unit	Surgical OPD	1	
		Medical OPD	2	
		Emergency	3	
		Surgical ward	4	
		Medical ward	5	
		Orthopedic ward	6	
		Others	7	

PART III. Personal Factors

S/N	Questions	Response	Code	Skip
101	use internet as source of knowledge on management if diabetic foot ulcer	yes	1	
		no	2	
102	use book as source of knowledge on management if diabetic foot ulcer	yes	1	
		no	2	
103	use articles as source of knowledge on management if diabetic foot ulcer	yes	1	
		no	2	
104	sharing with peers as source of knowledge	yes	1	
		no	2	

PART IV. Knowledge on Diabetic foot Ulcer

		Correct	Incorrect	I do not know
1	Neuropathy is the predominant factor responsible for diabetic ulcers (True)	1	2	3

2	Sensory neuropathy results in unnoticed skin damages, which lead to the formation of ulcers (True)	1	2	3
3	Autonomic neuropathy is associated with dry skin, which predisposes to ulcer formation (True)	1	2	3
4	Diabetic neuropathic ulcers are typically found on weight-bearing areas of the foot (True)	1	2	3
5	Diabetic ischemic ulcers are less painful than diabetic neuropathic ulcers (False)	1	2	3
6	Neuropathy can be excluded if the foot skin is cool and pulses are absent (False)	1	2	3
7	The risk of amputation is higher when diabetic foot ulcer is associated with limb ischemia (True)	1	2	3
8	Presence of slough is not an indication of infection in diabetic ulcers (False)	1	2	3
9	Presence of osteomyelitis impairs the healing of diabetic ulcers (True)	1	2	3
10	Wound healing progress is unsatisfactory if the wound bed appears pink (False)	1	2	3
11	Mechanical offloading should be advised to facilitate ulcer healing (True)	1	2	3
12	Hyperbaric oxygen therapy is recommended for ulcer healing even in a well perfused foot (False)	1	2	3
13	Infected, highly exuding wounds should be cleansed daily (True)	1	2	3
14	Iodine dressings are effective for wounds with clinical signs of infection (True)	1	2	3
15	Hydrogel dressings are useful to rehydrate the wound bed and control the moisture in wounds (True)	1	2	3

Part V. Attitudes to Diabetic foot Ulcer

		Strongly Agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
1	I think diabetic ulcer treatment is more important than ulcer prevention	1	2	3	4	5
2	I do not think it is necessary to assess diabetic ulcers regularly	1	2	3	4	5
3	Diabetic ulcer care is too time-consuming for me to carry out	1	2	3	4	5
4	In comparison with other areas of nursing care, diabetic ulcer care is a low priority task for me	1	2	3	4	5
5	If I have the opportunity, I would like to avoid caring for diabetic ulcers	1	2	3	4	5
6	I do not have time to advise each patient individually on how to look after their ulcers	1	2	3	4	5
7	It is not my responsibility to educate patients with diabetic ulcers on how to reduce re-ulceration	1	2	3	4	5
8	I cannot think about pain when cleaning diabetic ulcers	1	2	3	4	5
9	I do not like to care for diabetic ulcers in my practice	1	2	3	4	5
10	I do not get satisfaction by caring for diabetic ulcers	1	2	3	4	5

Part VI. Practice related questions

S/N	Questions	Response	Code	Skip
1	Have you ever read any of the diabetes management guidelines for healthcare providers?	Yes	1	
		No	2	

2	Have you ever attended a class on how to care for a diabetic patient's foot status?	Yes	1	
		no	2	
3	I do record in the file the foot examination of diabetic patients attending my facility	Yes	1	
		No	2	
4	I do ask patients about their foot status at each visit	Yes	1	
		No	2	
5	I do practice a 60-s screening tool assessment for all my diabetic patients	Yes	1	
		No	2	
6	I do check patient's feet for loss of sensation	Yes	1	
		No	2	
7	I do check diabetic patient's feet for any deformities, calluses, infections or ulcers at each visit	Yes	1	
		No	2	
8	I do check diabetic patient's footwear at each visit	Yes	1	
		No	2	
9	I always discuss diet with my diabetic patients	Yes	1	
		No	2	
10	I educate and encourage diabetic patients on smoking cessation	Yes	1	
		No	2	
11	Do you think you need training in diabetic foot care?	Yes	1	
		No	2	
12	I do not have diabetic wound care experience	Yes	1	
		No	2	

Amharic version

ክፍል I. የተሳታፊዎች ማህበራዊ ስነ-ሕዝብ እና ኢኮኖሚያዊ መረጃ.

S/N	ጥያቄዎች	ምላሽ	ኮድ	ዝላል
101	ዕድሜ (በዓመታት)			
102	ጾታ	ወንድ	1	
		ሴት	2	
103	የጋብቻ ሁኔታዎ ምን ይመስላል?	ያገባ	1	
		ያላገባ	2	
		የተፋታ	3	
		ባል/ሚስት የሞተባት	4	
104	የተመረቁበት ተቋም	የግል	1	
		የመንግስት	2	

105	የመማሪያ ፕሮግራም	መደበኛ	1	
		የማታ/የርቀት	2	
106	የትምህርት ደረጃ	ዲፕሎማ	1	
		ቢ.ኤስ.ሲ. እና በላይ	2	
107	የሙያ ዓይነት	ነርስ	1	
		የሕክምና ዶክተር	2	
		የጤና መኮንን	3	
		ሌላ	4	
108	ወርሃዊ ገቢ	_____		
109	የሥራ ልምድ (በዓመት)	_____		

ክፍል II. ተቋማዊ ምክንያቶች

S/N	ጥያቄዎች	ምላሽ	ኮድ	ዝላል
201	ስለ የስኳር በሽታ ቁስለት እንክብካቤ ስልጠና.	አዎ	1	
		አይ	2	
202	የስኳር በሽታ ሕክምና መመሪያ መኖር	አዎ	1	
		አይ	2	
203	የአሁኑ የሥራ ክፍል	የቀዶ ጥገና OPD	1	
		የአዋቂ የሕክምና OPD	2	
		ድንገተኛ አደጋ	3	
		የቀዶ ጥገና ክፍል	4	
		የአዋቂዎች የሕክምና ክፍል	5	
		የአጥንት ህክምና ክፍል	6	
		ሌላ	7	

ክፍል III. የግል ምክንያቶች

S/N	ጥያቄዎች	ምላሽ	ኮድ	ዝላል
101	ኢንተርኔትን እንደ የዕውቀት ምንጭ ይጠቀማሉ	አዎ	1	
		አይ	2	
102	መጽሐፍን እንደ የእውቀት ምንጭ ይጠቀማሉ	አዎ	1	
		አይ	2	
103	ጽሑፎችን እንደ የእውቀት ምንጭ ይጠቀማሉ	አዎ	1	
		አይ	2	
104	የእውቀት ምንጭ ከእኩዮች ጋር መጋራት	አዎ	1	
		አይ	2	

ክፍል IV. በስኳር ህመምተኛ የእግር ቁስለት ላይ ያለ እውቀት

		ትክክል	ትክክል አይደለም።	አላውቅም
1	ኒውሮፓቲ ለስኳር ቁስሎች (እውነት) ዋነኛው ምክንያት ነው.	1	2	3
2	የስሜት ሕዋሳት (ኒውሮፓቲ) የማይታወቅ የቆዳ ጉዳት ያስከትላል, ይህም ወደ ቁስለት መፈጠር ያስከትላል. (እውነት)	1	2	3
3	አውቶኖሚክ ኒውሮፓቲ ከደረቅ ቆዳ ጋር የተቆራኘ ነው, እሱም ወደ ቁስለት መፈጠር ያጋልጣል(እውነት).	1	2	3
4	የስኳር በሽታ ኒውሮፓቲካል ቁስሎች ብዙውን ጊዜ ከብደት በሚሸከሙ የእግር ቦታዎች ላይ ይገኛሉ (እውነት)	1	2	3
5	የስኳር በሽታ ischemic ቁስሎች ከዲያቢቲክ ኒውሮፓቲካል አልሰርስ ያነሰ ህመም ናቸው(ሐሰት).	1	2	3
6	የእግር ቆዳ ከቀዘቀዘ እና የልብ ምት ከሌለ ኒውሮፓቲ ሊወገድ ይችላል።(ሐሰት)	1	2	3
7	የስኳር ህመምተኛ የእግር ቁስለት ከ እግር ischemia ጋር ሲገናኝ የመቁረጥ እድሉ ከፍ ያለ ነው።(እውነት)	1	2	3
8	ሰሎው መኖሩ በዲያቢቲክ ቁስለት ውስጥ ኢንፌክሽን መኖሩን የሚያሳይ ምልክት አይደለም.(ሐሰት)	1	2	3
9	አስቲኦሜላይትስ (osteomyelitis) መኖሩ የስኳር ቁስሎችን መፈወስን ይጎዳል (እውነት)	1	2	3
10	ቁስሉ የየቆዳው አልጋው ሮዝ (ሐሰት) ከታየ ቁስሉ የማዳን ሂደት አጥጋቢ አይሆንም።	1	2	3
11	ቁስለት ፈውስ ለማመቻቸት ሜካኒካል ማራገፍ መመከር አለበት (እውነት)	1	2	3
12	ሃይፐርባርሪክ አክሲጅን ሕክምና ቁስሉን በደንብ በተቀባ እግር ውስጥ እንኳን ለማከም ይመከራል (ሐሰት)	1	2	3
13	የተበከለ፣ በጣም የሚወጡ ቁስሎች በየቀኑ መጽዳት አለባቸው (እውነት)	1	2	3

14	የኢንፌክሽን ክሊኒካዊ ምልክቶች ላላቸው ቁስሎች የአዮዲን ልብስ መልበስ ውጤታማ ነው (እውነት)	1	2	3
15	የሃይድሮጅል ልብሶች የቁስሉን አልጋ እንደገና ለማደስ እና በቁስሎች ውስጥ ያለውን እርጥበት ለመቆጣጠር ጠቃሚ ናቸው (እውነት)	1	2	3

ክፍል V. ለስኳር ህመምተኛ አግር ቁስለት ያለው አመለካከት

		በጣም እስማማለሁ	እስማማለሁ	መካከለኛ	አልስማማም ፡፡	በጣም አልስማማም፡፡
1	እኔ እንደማስበው ከቁስል መከላከል የስኳር በሽታ ሕክምና የበለጠ አስፈላጊ ነው	1	2	3	4	5
2	የስኳር በሽታ ቁስሎችን በየጊዜው መገምገም አስፈላጊ አይመስለኝም	1	2	3	4	5
3	የስኳር በሽታ ላለበት ቁስለት እንክብካቤ በጣም ጊዜ የሚፈጅ ነው	1	2	3	4	5
4	ከሌሎች የነርቢንግ እንክብካቤ ቦታዎች ጋር ሲነጻጸር የስኳር ህመምተኛ ቁስለት እንክብካቤ ለእኔ ዝቅተኛ ቅድሚያ የሚሰጠው ተግባር ነው፡፡	1	2	3	4	5
5	ዕድሉን ካገኘሁ የስኳር በሽታ ላለባቸው ቁስሎች እንክብካቤን ማስወገድ አፈፈጋለሁ	1	2	3	4	5
6	እያንዳንዱን ታካሚ ቁስላቸውን እንዴት እንደሚንከባከቡ ለየብቻ ለመምከር ጊዜ የለኝም	1	2	3	4	5
7	የስኳር በሽታ ያለባቸውን ታካሚዎች እንደገና ቁስሎችን እንዴት እንደሚቀንስ ማስተማር የእኔ ኃላፊነት አይደለም	1	2	3	4	5
8	የዲያቢክቲክ ቁስሎችን በማጽዳት ጊዜ ስለ ህመም ማሰብ አልችልም	1	2	3	4	5
9	በተግባራዊ ውስጥ የስኳር በሽታ ቁስለትን መንከባከብ አልወድም	1	2	3	4	5
10	የዲያቢክቲክ ቁስለትን በመንከባከብ እርካታ አላገኘሁም፡፡	1	2	3	4	5

ክፍል VI. ተዛማጅ ጥያቄዎችን ይለማመዱ

S/N	ጥያቄዎች	ምላሽ	ኮድ	ዝላል
1	ለጤና አጠባበቅ አቅራቢዎች የስኳር በሽታ ህክምና መመሪያዎችን አንብበው ያውቃሉ?	አዎ	1	
		አይ	2	
2	ለስኳር ህመምተኛ የእግር ችግርን እንዴት እንደሚንከባከቡ በክፍል ውስጥ ተሳትፈዋል?	አዎ	1	
		አይ	2	
3	በፋሲሊቲዬ ውስጥ የሚገኙትን የስኳር ህመምተኞች የእግር ምርመራ በፋይሉ ውስጥ አስመዘግባለሁ።	አዎ	1	
		አይ	2	
4	በእያንዳንዱ ጉብኝት ሕመምተኞችን ስለ እግሮቻቸው ችግር አጠይቃለሁ	አዎ	1	
		አይ	2	
5	ለሁሉም የስኳር ህመምተኞቻቸው የ60-ዎች የማጣሪያ መሳሪያ ግምገማን አለማመዳለሁ።	አዎ	1	
		አይ	2	

6	የሕመም ስሜቶችን ማጣት አለማጣታቸውን የታካሚውን እግሮች አረጋግጣለሁ።	አዎ	1	
		አይ	2	
7	በእያንዳንዱ ጉብኝት ላይ ለማንኛውም የአካል ጉዳት፣ የቁርጭምጭሚት ህመም፣ ኢንፌክሽኖች ወይም ቁስሎች ካሉ የስኳር ህመምተኛውን እግር ያረጋግጡ	አዎ	1	
		አይ	2	
8	በእያንዳንዱ ጉብኝት የስኳር ህመምተኛ መግለጫዎችን እመለከታለሁ	አዎ	1	
		አይ	2	
9	ስስኳር ህመምተኞች ጋር ሁል ጊዜ ስለ አመጋገብ እወያያለሁ።	አዎ	1	
		አይ	2	
10	የስኳር ህመምተኞች ማጨስን እንዲያቆሙ አስተምራለሁ እና አበረታታለሁ።	አዎ	1	
		አይ	2	
11	በስኳር ህመምተኛ እግር እንክብካቤ ላይ ስልጠና ያስፈልግዎታል ብለው ያስባሉ?	አዎ	1	
		አይ	2	
12	የቁስል እንክብካቤ ልምድ የለኝም	አዎ	1	
		አይ	2	