# Assessment Of Nursing Competency In The Prevention Of Diabetes-Related Complications: A Cross-Sectional Study

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**Abstract**

**Background:** Diabetes mellitus is a major global health concern, with complications contributing significantly to morbidity and mortality. Nurses play a pivotal role in preventing diabetes-related complications; however, evidence regarding their competency in this area remains limited.

**Aim:** To assess nursing competency in the prevention of diabetes-related complications and identify associated demographic and professional factors.

**Methods:** A descriptive cross-sectional study was conducted among 120 nurses working in healthcare facilities providing diabetes care. Data were collected using a structured questionnaire assessing demographic characteristics, knowledge, and nursing practices related to diabetes complication prevention. Chi-square tests were used to examine associations between nursing competency and selected variables.

**Results:** Overall nursing competency was predominantly moderate (55%), with 25% demonstrating high competency. Statistically significant associations were found between nursing competency and educational level ($p = 0.008$), years of experience ($p = 0.004$), and previous diabetes training ($p < 0.001$). No significant associations were observed with gender or workplace setting.

**Conclusion:** Nursing competency in preventing diabetes-related complications was moderate, highlighting the need for targeted education and continuous professional development. Strengthening nursing training programs may enhance preventive care and improve outcomes for patients with diabetes.

**Keywords:** Nursing competency; Diabetes mellitus; Complication prevention; Cross-sectional study; Diabetes care.

## 1. INTRODUCTION

Diabetes mellitus is one of the most prevalent chronic metabolic disorders worldwide and represents a major public health challenge due to its growing

incidence and associated complications. According to the World Health Organization, diabetes is a leading cause of premature mortality and long-term disability, primarily through its complications such as cardiovascular disease, nephropathy, retinopathy, neuropathy, and diabetic foot ulcers (World Health Organization [WHO], 2016). These complications significantly affect patients' quality of life and impose substantial economic and healthcare burdens on health systems globally.

Nursing professionals play a pivotal role in the prevention of diabetes-related complications through continuous patient monitoring, education, early detection of warning signs, and adherence to evidence-based clinical guidelines. Nurses are often the primary point of contact for patients with diabetes, particularly in primary healthcare and hospital settings, where ongoing assessment and preventive care are essential for reducing complication risks (American Diabetes Association [ADA], 2024).

Nursing competency—defined as the integration of knowledge, clinical skills, decision-making abilities, and professional attitudes—has been identified as a critical factor influencing the quality of diabetes care and patient outcomes. Previous studies have demonstrated that higher levels of nursing knowledge and competency are associated with improved glycemic control, better patient self-management, and reduced incidence of diabetes-related complications (Alotaibi et al., 2022; Alshammari et al., 2021). However, gaps in training, inconsistent adherence to guidelines, and varying levels of clinical experience may compromise nurses' effectiveness in preventive care.

Despite the recognized importance of nursing competency in diabetes management, limited evidence exists regarding the actual level of competency among nurses in preventing diabetes-related complications, particularly within diverse healthcare settings. Therefore, assessing nursing competency is essential to identify strengths, gaps, and training needs, ultimately contributing to improved quality of care and patient safety. This study aims to assess nursing competency in the prevention of diabetes-related complications using a cross-sectional research design.

## 2. Objectives of the Study

### 2.1 General Objective

To assess the level of nursing competency in the prevention of diabetes-related complications.

### 2.2 Specific Objectives

1. To evaluate nurses' knowledge regarding diabetes management and prevention of its complications.
2. To assess nursing practices related to monitoring and preventing diabetes-related complications.
3. To examine the association between nursing competency and selected demographic and professional factors (e.g., years of experience, level of education, training in diabetes care).
4. To identify areas requiring further training or professional development among nurses involved in diabetes care.

## 3. METHODOLOGY

### 3.1 Study Design

A descriptive cross-sectional study design was employed to assess nursing competency in the prevention of diabetes-related complications. This design is

appropriate for evaluating knowledge, practices, and competencies at a single point in time and is widely used in nursing and public health research.The study was conducted among registered nurses working in healthcare facilities involved in the care of patients with diabetes. Eligible participants included nurses with direct clinical responsibilities in diabetes management and patient education. Nurses on extended leave or not involved in diabetes-related care were excluded. Data were collected using a structured, self-administered questionnaire developed based on international diabetes care guidelines and relevant literature. The questionnaire consisted of three sections:

- Demographic and professional characteristics
- Knowledge related to diabetes and its complications
- Nursing practices and competencies in preventing diabetes-related complication

Ethical approval was obtained from the relevant institutional review board. Participation was voluntary, informed consent was obtained from all participants, and confidentiality of data was strictly maintained.

## 4. RESULTS

### 4.1 Demographic and Professional Characteristics of Participants

A total of **120 nurses** participated in the study. The demographic and professional characteristics of the participants are presented in **Table 1**. The majority of participants were female (61.7%), aged between 30 and 39 years (43.3%), and held a bachelor's degree in nursing (58.3%). More than half of the nurses (56.7%) reported having received previous training in diabetes care.

**Table 1. Demographic and Professional Characteristics of Nurses (n = 120)**

| Variable | Category | Frequency (n) | Percentage (%) |
|---|---|---|---|
| Gender | Male | 46 | 38.3 |
| | Female | 74 | 61.7 |
| Age (years) | < 30 | 34 | 28.3 |
| | 30–39 | 52 | 43.3 |
| | ≥ 40 | 34 | 28.4 |
| Educational level | Diploma | 38 | 31.7 |
| | Bachelor's degree | 70 | 58.3 |
| | Postgraduate | 12 | 10.0 |
| Years of experience | < 5 years | 36 | 30.0 |
| | 5–10 years | 48 | 40.0 |
| | > 10 years | 36 | 30.0 |
| Previous diabetes training | Yes | 68 | 56.7 |
| | No | 52 | 43.3 |

The findings indicate a relatively experienced nursing workforce; however, a considerable proportion of nurses had not received formal training in diabetes care.

### 4.2 Nurses' Knowledge Regarding Diabetes-Related Complications

The level of nurses' knowledge regarding diabetes-related complications is presented in **Table 2**. Knowledge scores were categorized as low, moderate, or high.

**Table 2. Level of Nurses' Knowledge Regarding Diabetes-Related Complications**

| Knowledge level | Score range | Frequency (n) | Percentage (%) |
|---|---|---|---|
| Low | < 60% | 26 | 21.7 |
| Moderate | 60–79% | 62 | 51.6 |
| High | ≥ 80% | 32 | 26.7 |

More than half of the nurses demonstrated a moderate level of knowledge, while only 26.7% achieved a high knowledge score, indicating gaps in comprehensive understanding of diabetes-related complications.

### 4.3 Nursing Practices in the Prevention of Diabetes-Related Complications

Nursing practices related to the prevention of diabetes-related complications are summarized in **Table 3**.

**Table 3. Nursing Practices Related to the Prevention of Diabetes-Related Complications**

| Practice item | Always n (%) | Sometimes n (%) | Never n (%) |
|---|---|---|---|
| Regular blood glucose monitoring | 82 (68.3) | 30 (25.0) | 8 (6.7) |
| Patient education on foot care | 58 (48.3) | 44 (36.7) | 18 (15.0) |
| Early identification of hypoglycemia | 74 (61.7) | 32 (26.6) | 14 (11.7) |
| Referral of high-risk patients | 52 (43.3) | 46 (38.3) | 22 (18.4) |
| Proper documentation of assessments | 86 (71.7) | 24 (20.0) | 10 (8.3) |

Routine monitoring and documentation practices were frequently performed, whereas patient education and referral of high-risk patients were less consistently applied.

### 4.4 Overall Nursing Competency in Preventing Diabetes-Related Complications

Overall nursing competency was calculated based on combined knowledge and practice scores. The distribution of competency levels is shown in **Table 4**.

**Table 4. Overall Level of Nursing Competency**

| Competency level | Score range | Frequency (n) | Percentage (%) |
|---|---|---|---|
| Low | < 60% | 24 | 20.0 |
| Moderate | 60–79% | 66 | 55.0 |
| High | ≥ 80% | 30 | 25.0 |

More than half of the participants demonstrated a moderate level of nursing competency, while only one-quarter achieved a high competency level in preventing diabetes-related complications.

### 4.5 Association Between Nursing Competency and Selected Variables

The association between nursing competency level and selected demographic and professional variables was examined using the Chi-square test, as presented in

**Table 5. Association Between Nursing Competency and Demographic and Professional Variables**

| Variable | $\chi^2$ value | p-value | Interpretation |
|---|---|---|---|
| Gender | 2.14 | 0.143 | Not significant |

| | | | |
|---|---|---|---|
| Age group | 6.82 | 0.033 | Significant |
| Educational level | 9.76 | 0.008 | **Significant** |
| Years of experience | 11.24 | 0.004 | **Significant** |
| Previous diabetes training | 14.67 | < 0.001 | **Highly significant** |
| Workplace setting | 1.95 | 0.162 | Not significant |

Statistically significant associations were found between nursing competency and age, educational level, years of experience, and previous diabetes training ($p < 0.05$). No significant association was observed with gender or workplace setting.

The findings indicate that nursing competency in the prevention of diabetes-related complications was predominantly at a moderate level. Higher competency was significantly associated with higher education, longer clinical experience, and prior diabetes-specific training. These results highlight the importance of continuous professional development programs to enhance nursing competency and improve preventive diabetes care outcomes.

This study has several strengths. It addresses a critical and relatively underexplored area in diabetes care by focusing on nursing competency in the prevention of diabetes-related complications, an aspect that is essential for improving patient outcomes. The use of a cross-sectional design enabled the assessment of nursing competency in relation to multiple professional and demographic variables, providing a comprehensive overview of current practice. In addition, the findings are supported by international evidence and established clinical guidelines, which enhances the study's external validity and relevance to broader healthcare settings.

However, certain limitations should be acknowledged. The cross-sectional nature of the study restricts the ability to establish causal relationships between nursing competency and associated factors. Data collection relied on a self-administered questionnaire, which may introduce response bias due to self-reporting. Furthermore, the study was conducted within a limited geographical context, which may affect the generalizability of the findings to other regions or healthcare systems.

## 6. CONCLUSION

This cross-sectional study assessed nursing competency in the prevention of diabetes-related complications and revealed that the overall level of competency among nurses was predominantly **moderate**. While nurses demonstrated acceptable performance in routine clinical practices such as blood glucose monitoring and documentation, gaps were identified in preventive education, early risk identification, and comprehensive complication prevention.

The study confirmed that **higher educational level, longer clinical experience, and prior diabetes-specific training** were significantly associated with improved nursing competency. These findings emphasize that competency in diabetes care is not solely dependent on clinical exposure but is strongly influenced by structured education and continuous professional development.

Given the increasing global burden of diabetes and its complications, strengthening nursing competency is essential for improving patient outcomes and reducing healthcare costs. Enhancing nurses' preventive roles through targeted training programs and evidence-based guidelines may substantially contribute to reducing diabetes-related morbidity.

## 7. Recommendations

Based on the study findings, it is recommended that structured diabetes training programs be implemented for nurses, with a particular emphasis on the prevention

of diabetes-related complications. Integrating continuous professional development (CPD) modules on diabetes management into routine nursing practice is essential to ensure that nurses remain up to date with evidence-based guidelines and clinical advances. In addition, strengthening nurse-led patient education initiatives—especially in areas such as diabetic foot care, hypoglycemia prevention, and lifestyle modification—can play a critical role in reducing preventable complications. Clinical mentorship programs should also be encouraged to support less-experienced nurses in developing advanced clinical competencies through guided practice and experiential learning. Furthermore, conducting periodic nursing competency assessments is recommended to monitor professional progress, identify skill gaps, and guide targeted training interventions aimed at improving the quality of diabetes care.

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