

# **Chronic Disease Management in Nursing: A Comprehensive Review of Diabetes Mellitus**

## **Abstract**

Diabetes mellitus is a chronic disease that presents significant challenges in healthcare management. Nurses play a crucial role in managing diabetes by providing education, monitoring patient health, and implementing lifestyle interventions. This review explores the various aspects of diabetes management in nursing, highlighting the importance of patient-centered care and the integration of technology. Through a comprehensive analysis of current practices and case studies, this paper underscores the need for continued education and innovation in nursing to improve outcomes for patients with diabetes.

## **Keywords**

Chronic Disease Management, Diabetes Education, Diabetes Mellitus, Nursing, Patient Care.

## **Introduction**

Diabetes mellitus (DM) represents a significant and growing health concern, affecting over 463 million adults globally, according to the International Diabetes Federation (IDF). This number is projected to rise to 700 million by 2045, underscoring the urgency for effective management strategies. Diabetes is a chronic condition characterized by elevated blood glucose levels due to either the body's inability to produce insulin (Type 1 diabetes) or the body's ineffective use of insulin (Type 2 diabetes) [1]. The complexity of diabetes management is compounded by the wide range of potential complications, including cardiovascular disease, kidney failure, neuropathy, and retinopathy, all of which contribute to increased morbidity and mortality rates [2].

The chronic nature of diabetes requires patients to be vigilant in their daily management, involving regular monitoring of blood glucose levels, adherence to medication, dietary modifications, and physical activity. This multifaceted approach necessitates a comprehensive healthcare strategy, in which nurses play a pivotal role. Nurses are often the first point of contact for patients and serve as primary caregivers in various healthcare settings, from hospitals to community clinics. Their role extends beyond mere clinical care to encompass patient education, support for self-management, and continuous monitoring, all of which are essential for effective diabetes management [3].

Nursing care in diabetes management is not only about treating the disease but also about empowering patients to manage their condition effectively. This empowerment is achieved through education and support, enabling patients to take control of their health and make informed decisions about their care. The nurse's role is also evolving with the advent of new technologies, such as continuous glucose monitoring systems, telehealth services, and mobile health applications, which offer innovative ways to manage diabetes and improve patient outcomes [4].

Despite the critical role of nurses in diabetes care, there are numerous challenges that complicate the management of the disease. These challenges include patient non-adherence to treatment regimens, socioeconomic barriers that limit access to care, and the psychological burden of managing a chronic condition. Additionally, the increasing prevalence of diabetes places a strain on healthcare resources, necessitating the need for efficient and sustainable management strategies [5].

This review aims to explore the various dimensions of nursing involvement in diabetes management, focusing on current strategies, the challenges faced by nurses, and the potential of emerging technologies to enhance patient care. By examining the existing literature and presenting case studies, this paper seeks to provide a comprehensive overview of the critical role that nurses play in managing diabetes mellitus. Furthermore, it aims to identify areas where nursing practice can be improved, offering insights into how healthcare systems can better support nurses in their efforts to manage this complex chronic disease [6].

## 2. Background on Diabetes Mellitus

Diabetes mellitus (DM) encompasses a group of metabolic disorders that share the common characteristic of chronic hyperglycemia, which arises due to either defective insulin secretion, impaired insulin action, or a combination of both. This sustained elevation in blood glucose levels can lead to a wide range of complications if not adequately managed, significantly impacting the patient's quality of life and overall health outcomes.

### 2.1. Classification of Diabetes Mellitus

Diabetes mellitus is primarily classified into three major types:

1. **Type 1 Diabetes Mellitus (T1DM):** Type 1 diabetes is an autoimmune disorder in which the body's immune system mistakenly attacks and destroys the insulin-producing beta cells in the pancreas. As a result, individuals with T1DM produce little to no insulin, a hormone essential for glucose uptake into cells for energy production. T1DM typically manifests in childhood or adolescence but can develop at any age. It accounts for approximately 5-10% of all diabetes cases. Management of T1DM requires lifelong insulin therapy, along with vigilant monitoring of blood glucose levels, dietary management, and regular physical activity [7].
2. **Type 2 Diabetes Mellitus (T2DM):** Type 2 diabetes is the most prevalent form of diabetes, accounting for about 90-95% of all cases. Unlike T1DM, T2DM is primarily characterized by insulin resistance, where the body's cells become less responsive to insulin. Initially, the pancreas compensates by producing more insulin, but over time, insulin production may become insufficient. T2DM is more common in adults, particularly those who are overweight or obese, have a sedentary lifestyle, or have a family history of diabetes. Management typically includes lifestyle modifications (diet and exercise), oral hypoglycemic agents, and sometimes insulin therapy as the disease progresses [8].
3. **Gestational Diabetes Mellitus (GDM):** Gestational diabetes is a form of diabetes that is first recognized during pregnancy. It occurs when the body cannot produce enough

insulin to meet the increased demands during pregnancy, leading to hyperglycemia. While GDM usually resolves after childbirth, women who experience it are at a higher risk of developing T2DM later in life. Additionally, GDM can have adverse effects on both the mother and the fetus, including an increased risk of preeclampsia, cesarean delivery, and neonatal complications such as macrosomia and hypoglycemia [9].

## **2.2. Global Prevalence and Impact**

The prevalence of diabetes has been steadily increasing globally, driven by factors such as urbanization, aging populations, rising obesity rates, and sedentary lifestyles. The World Health Organization (WHO) estimates that approximately 422 million people worldwide are living with diabetes, a number that has nearly quadrupled since 1980. This alarming rise has made diabetes one of the most common non-communicable diseases globally.

Type 2 diabetes is the most significant contributor to the global diabetes burden, with its prevalence increasing in both developed and developing countries. The shift towards more sedentary lifestyles, combined with dietary changes and increasing obesity rates, has exacerbated the spread of T2DM, particularly in low- and middle-income countries [10].

## **2.3. Complications Associated with Diabetes Mellitus**

Diabetes mellitus is associated with a range of acute and chronic complications that can affect multiple organ systems. These complications are primarily due to the prolonged exposure to high blood glucose levels, which can cause damage to blood vessels and nerves throughout the body. Some of the most common and severe complications include:

- **Cardiovascular Disease:** Individuals with diabetes are at a significantly higher risk of developing cardiovascular diseases (CVD), including coronary artery disease, stroke, and peripheral artery disease. CVD is the leading cause of morbidity and mortality among people with diabetes.
- **Diabetic Nephropathy:** Diabetes is a leading cause of chronic kidney disease (CKD) and end-stage renal disease (ESRD). Diabetic nephropathy results from damage to the blood

vessels in the kidneys, leading to proteinuria, declining kidney function, and eventually, kidney failure [11].

- **Diabetic Retinopathy:** This condition is a leading cause of blindness in adults. Diabetic retinopathy occurs when the blood vessels in the retina are damaged due to prolonged hyperglycemia, leading to vision impairment and, in severe cases, blindness.
- **Diabetic Neuropathy:** Nerve damage caused by diabetes, known as diabetic neuropathy, can lead to various problems, including peripheral neuropathy (causing pain, tingling, and numbness in the extremities), autonomic neuropathy (affecting internal organs), and other forms of nerve damage.
- **Foot Complications:** Diabetic neuropathy and poor blood circulation in the lower limbs can lead to foot ulcers, infections, and, in severe cases, gangrene, often necessitating amputation.

The complications of diabetes significantly contribute to the disease's burden, both in terms of healthcare costs and the impact on patients' quality of life. Effective management of diabetes is therefore crucial not only to control blood glucose levels but also to prevent or delay the onset of these serious complications.

### **3. Role of Nursing in Chronic Disease Management**

Nurses are pivotal in managing chronic diseases, particularly diabetes mellitus, where their responsibilities encompass clinical care, patient education, emotional support, and advocacy for healthier lifestyle choices. Diabetes requires ongoing self-management and frequent interaction with healthcare providers, making nurses an essential link between patients and the broader healthcare system.

#### **3.1. Patient Education and Empowerment**

Education is central to diabetes management, as patients must understand the disease and adhere to a complex regimen involving medication, diet, physical activity, and regular blood glucose monitoring. Nurses are tasked with ensuring patients have the knowledge and skills necessary to manage their diabetes effectively [12].

Key educational topics include:

- **Understanding Diabetes:** Nurses explain the pathophysiology of diabetes, helping patients comprehend how the disease affects their body and the importance of maintaining blood glucose control.
- **Medication Management:** Patients are instructed on how to administer insulin or other diabetes medications, the significance of medication adherence, and how to recognize and manage potential side effects.
- **Dietary Guidance:** Nurses provide nutritional education tailored to each patient's needs, emphasizing the role of a balanced diet in managing blood glucose levels. Collaboration with dietitians is common to develop individualized meal plans.
- **Physical Activity:** Nurses promote regular physical activity, explaining how exercise can enhance insulin sensitivity and help control blood glucose levels.
- **Monitoring and Record Keeping:** Nurses teach patients to monitor their blood glucose levels, use glucose meters, and maintain accurate records. They also stress the importance of monitoring for complications, such as changes in vision or sensation in the feet.

Through education, nurses empower patients to take an active role in managing their condition, fostering self-efficacy and enabling informed decision-making regarding their care.

### **3.2. Supporting Self-Management**

Effective diabetes care hinges on patient self-management. Nurses support patients as they navigate the daily challenges of managing diabetes, providing ongoing guidance, motivation, and encouragement.

Nurses assist in developing personalized self-management plans that consider the patient's unique circumstances, such as work schedules, family responsibilities, and cultural preferences. They help patients set realistic goals and offer strategies to overcome barriers to self-management, such as difficulty adhering to a diet or finding time for exercise.

Beyond practical support, nurses provide emotional support, recognizing the psychological burden of living with a chronic disease. They listen to patients' concerns, offer reassurance, and

connect them with additional resources, such as counseling services or support groups, when necessary [13].

### **3.3. Advocacy for Lifestyle Changes**

Lifestyle modifications are vital for managing diabetes, especially for Type 2 diabetes, where diet, physical activity, and weight management are critical to disease progression and control. Nurses advocate for these lifestyle changes, collaborating with patients to encourage healthier behaviors.

Nurses guide patients in adopting a balanced diet rich in whole grains, fruits, vegetables, and lean proteins while reducing intake of processed foods, sugars, and saturated fats. They also emphasize the importance of regular physical activity and guide patients on incorporating exercise into their daily routines.

In their advocacy role, nurses address barriers to lifestyle changes, such as limited access to healthy foods, safe environments for exercise, or social support. They work to identify and mitigate these barriers, whether through patient education, connecting patients with community resources, or advocating for policy changes at the organizational or community level [14].

### **3.4. Continuous Care and Monitoring**

Chronic disease management, particularly for diabetes, requires continuous care and monitoring to prevent complications and ensure optimal outcomes. Nurses often coordinate and deliver this ongoing care.

Nurses monitor patients' progress through regular check-ins, whether in person, by phone, or through telehealth platforms. They assess adherence to management plans, review blood glucose records, and adjust care plans as needed. Monitoring for the development of complications, such as neuropathy or retinopathy, is also a critical aspect of their role.

By providing continuous care and monitoring, nurses help maintain patient engagement in their care plan, ensuring early detection and intervention for potential issues, thereby improving long-term outcomes for patients with diabetes [15].

## 4. Diabetes Management Strategies

Effective diabetes management requires a multifaceted approach that addresses the various aspects of the disease. Nurses play a crucial role in implementing these strategies, ensuring that patients receive comprehensive care that empowers them to manage their condition effectively. This section outlines key diabetes management strategies, focusing on patient education and self-management, medication management, lifestyle interventions, and the integration of technology.

### 4.1. Patient Education and Self-Management

Patient education is the cornerstone of diabetes management. Given the chronic nature of diabetes, patients must be equipped with the knowledge and tools necessary to manage their condition on a daily basis. Nurses are at the forefront of this educational effort, providing patients with the information they need to make informed decisions about their health.

- **Blood Glucose Monitoring:** Nurses teach patients how to accurately monitor their blood glucose levels, an essential component of diabetes management. This includes training on the use of glucose meters, understanding target blood glucose ranges, and interpreting the results.
- **Recognizing Hyperglycemia and Hypoglycemia:** Patients are educated on the signs and symptoms of hyperglycemia (high blood glucose) and hypoglycemia (low blood glucose). Understanding these symptoms enables patients to take timely action, such as adjusting their medication or seeking medical help, to prevent serious complications.
- **Diet and Lifestyle Decisions:** Nurses provide guidance on how to make healthy dietary choices and incorporate physical activity into daily routines. This education is tailored to individual needs, taking into account personal preferences, cultural practices, and any barriers to making these changes.

Self-management is crucial for patients with diabetes as it allows them to take control of their health and minimize the risk of complications. Nurses support this by offering continuous education and encouragement, empowering patients to be active participants in their care [16].

### 4.2. Medication Management

Medication management is vital in achieving and maintaining optimal blood glucose levels in patients with diabetes. Nurses play a central role in this process by ensuring that patients receive and correctly use their medications.

- **Administration of Medications:** Nurses are responsible for administering insulin and other diabetes medications, whether in a clinical setting or by educating patients on self-administration techniques at home. Proper administration is crucial to maintaining blood glucose control.
- **Monitoring for Side Effects:** Nurses monitor patients for potential side effects of diabetes medications, such as hypoglycemia, weight gain, or gastrointestinal issues. Early identification of side effects allows for timely intervention and adjustments to the treatment plan.
- **Medication Adherence:** Nurses educate patients on the importance of adhering to their prescribed medication regimen. This includes discussing the consequences of missed doses, the need for regular medication timing, and addressing any challenges patients may face in taking their medications consistently.

By managing medication effectively, nurses help ensure that patients maintain stable blood glucose levels, reducing the risk of acute complications and long-term damage associated with poorly controlled diabetes [17].

### 4.3. Lifestyle Interventions

Lifestyle interventions, including diet and exercise, are critical components of diabetes management. Nurses work closely with patients to develop individualized lifestyle plans that support healthy living and effective diabetes control.

- **Dietary Planning:** Nurses collaborate with dietitians to create personalized meal plans that align with patients' health goals and cultural preferences. These plans emphasize balanced nutrition, portion control, and the inclusion of foods that help stabilize blood glucose levels.
- **Physical Activity:** Nurses encourage patients to incorporate regular physical activity into their daily routines. Exercise improves insulin sensitivity, aids in weight management,

and contributes to overall health. Nurses help patients find activities that are enjoyable and sustainable, offering guidance on how to safely increase physical activity levels.

- **Support and Motivation:** Maintaining lifestyle changes can be challenging, especially over the long term. Nurses provide ongoing support and motivation, helping patients stay committed to their health goals. They also help patients navigate barriers to lifestyle changes, such as lack of time, resources, or social support.

Through these interventions, nurses help patients achieve better blood glucose control, reduce the risk of complications, and improve their overall quality of life [18].

#### 4.4. Technology in Diabetes Management

The integration of technology in diabetes management has revolutionized the way patients monitor and manage their condition. Nurses play a key role in helping patients incorporate these technological tools into their daily care.

- **Continuous Glucose Monitors (CGMs):** CGMs provide real-time blood glucose readings, allowing for more precise management of diabetes. Nurses educate patients on how to use CGMs, interpret the data, and make necessary adjustments to their treatment plans.
- **Insulin Pumps:** Insulin pumps deliver a continuous supply of insulin, offering an alternative to multiple daily injections. Nurses train patients on how to operate insulin pumps, manage the infusion site, and troubleshoot any issues that may arise.
- **Mobile Health Applications:** Mobile apps designed for diabetes management can track blood glucose levels, medication usage, diet, and physical activity. Nurses guide patients in selecting appropriate apps, setting up the technology, and using the data to improve their self-management practices.
- **Telehealth Services:** The rise of telehealth has expanded access to diabetes care, particularly for patients in remote or underserved areas. Nurses use telehealth platforms to provide education, monitor patient progress, and offer real-time support, ensuring continuous care despite geographical barriers [19].

#### 5. Challenges in Diabetes Management

While advancements in diabetes care have significantly improved patient outcomes, several challenges continue to impede effective management. Nurses, who are at the forefront of patient care, often encounter these obstacles, which can complicate the management of diabetes mellitus.

### **5.1. Patient Adherence to Treatment Plans**

One of the most significant challenges in diabetes management is ensuring patient adherence to treatment plans. Diabetes management requires a comprehensive approach that includes medication adherence, lifestyle changes, and regular monitoring of blood glucose levels. However, many patients struggle with the following:

- **Medication Regimen:** Patients may forget to take their medications, misunderstand dosing instructions, or intentionally skip doses due to side effects or perceived lack of immediate benefit.
- **Lifestyle Changes:** Adopting and maintaining healthier lifestyle habits, such as dietary changes and increased physical activity, can be difficult for many patients. Cultural preferences, personal habits, and social pressures can further complicate these efforts.
- **Blood Glucose Monitoring:** Regular monitoring is essential for effective diabetes management, yet some patients find it cumbersome or invasive, leading to inconsistent monitoring practices.

Nurses must continuously work to reinforce the importance of adherence and provide strategies to overcome these barriers. This may involve personalized education, regular follow-ups, and motivational support to help patients stay on track with their treatment plans [20].

### **5.2. Health Disparities**

Health disparities significantly impact diabetes management, particularly among patients from lower socioeconomic backgrounds. These disparities manifest in various ways:

- **Access to Care:** Patients from disadvantaged backgrounds often have limited access to healthcare services, including regular check-ups, specialist care, and diabetes education.

Geographic barriers, lack of transportation, and financial constraints can further exacerbate these issues.

- **Financial Barriers:** The cost of diabetes care, including medications, monitoring devices, and healthy foods, can be prohibitive for some patients. Those without adequate health insurance may face significant out-of-pocket expenses, leading to delayed or skipped care.
- **Cultural and Language Barriers:** Cultural beliefs and language differences can hinder effective communication between patients and healthcare providers. Misunderstandings or mistrust can lead to poor adherence and engagement in diabetes management.

Nurses play a critical role in addressing these disparities by advocating for equitable access to care, providing culturally sensitive education, and connecting patients with community resources that can help mitigate some of these barriers [21].

### 5.3. Resource Limitations

Resource limitations, including shortages of healthcare providers and limited access to technology, pose significant challenges in diabetes management:

- **Healthcare Provider Shortages:** In many areas, particularly in rural or underserved communities, there is a shortage of healthcare providers specializing in diabetes care. This can lead to longer wait times for appointments, reduced access to specialized care, and increased reliance on primary care providers who may not have extensive experience in managing complex diabetes cases.
- **Access to Technology:** Advances in diabetes management, such as continuous glucose monitors (CGMs) and insulin pumps, have revolutionized care. However, access to these technologies is not universal. Patients in low-resource settings may not have access to the latest tools due to cost, lack of availability, or insufficient healthcare infrastructure.
- **Educational Resources:** Limited availability of educational resources, such as diabetes education programs and support groups, can hinder patient empowerment and self-management. Without adequate education and support, patients may struggle to manage their condition effectively [22]

## 6. Case Studies in Nursing and Diabetes Management

Case studies offer insightful examples of how nursing interventions are applied in real-world scenarios to manage diabetes mellitus. These examples illustrate the diverse strategies nurses use to support patients and highlight their critical role in improving diabetes outcomes.

### 6.1. Case Study: Managing Type 2 Diabetes through Integrated Care

**Patient Background:** Mrs. A, a 58-year-old woman with Type 2 diabetes, presented with poorly controlled blood glucose levels despite being on oral hypoglycemic agents. She had a history of hypertension and was overweight, with a sedentary lifestyle and dietary habits that included high sugar intake.

#### **Nursing Interventions:**

- **Medication Management:** The nurse reviewed Mrs. A's medication regimen and collaborated with her healthcare provider to adjust her medications for better glycemic control. This included transitioning to a combination of oral medications and initiating metformin.
- **Lifestyle Interventions:** The nurse worked with a dietitian to develop a personalized meal plan that emphasized balanced nutrition and portion control. Additionally, the nurse encouraged Mrs. A to engage in regular physical activity, starting with moderate exercise such as walking.
- **Technology Use:** Mrs. A was introduced to a mobile health app that tracked her blood glucose levels, diet, and physical activity. The nurse provided training on how to use the app effectively and incorporated its data into follow-up visits to tailor her care plan.

**Outcomes:** After three months, Mrs. A showed significant improvement in her blood glucose control, with reduced HbA1c levels. Her weight decreased, and she reported feeling more energetic and motivated to maintain her lifestyle changes. Regular follow-ups and continuous support from the nurse were crucial in sustaining these improvements [23].

### 6.2. Case Study: Transitioning to Insulin Pump Therapy for Type 1 Diabetes

**Patient Background:** Mr. B, a 24-year-old man with Type 1 diabetes, had been managing his condition with multiple daily insulin injections. Despite his efforts, he experienced frequent hypoglycemic episodes and struggled with achieving stable glucose levels.

#### **Nursing Interventions:**

- **Insulin Pump Education:** The nurse provided comprehensive education on the use of an insulin pump, including its operation, programming, and maintenance. This education was delivered through hands-on demonstrations and written materials.
- **Support During Transition:** The nurse offered ongoing support during Mr. B's transition to the insulin pump, addressing any technical issues and adjusting the insulin delivery settings based on his blood glucose patterns.
- **Follow-up and Monitoring:** Regular follow-up appointments were scheduled to assess the effectiveness of the insulin pump therapy, review blood glucose data, and make necessary adjustments. The nurse also provided psychological support to help Mr. B adapt to the new technology and manage any anxiety associated with the change.

**Outcomes:** Mr. B experienced a significant reduction in hypoglycemic episodes and improved overall glycemic control. The insulin pump enabled more precise insulin delivery and better management of his diabetes. The nurse's support was instrumental in helping Mr. B successfully transition to and effectively use the insulin pump.

### **6.3. Case Study: Addressing Health Disparities in Diabetes Care**

**Patient Background:** Ms. C, a 45-year-old woman from a low-income background, struggled with managing her Type 2 diabetes. She faced barriers such as limited access to healthy foods, inadequate health insurance, and inconsistent access to healthcare services.

#### **Nursing Interventions:**

- **Resource Navigation:** The nurse helped Ms. C navigate available community resources, including access to a local food pantry that provided healthy food options and assistance with obtaining affordable medications.

- **Education and Empowerment:** Tailored diabetes education was provided, focusing on practical strategies for managing diabetes within her constraints. The nurse emphasized the importance of making the most of available resources and self-management techniques.
- **Advocacy:** The nurse advocated for Ms. C's access to necessary healthcare services, including assistance with insurance and connections to free or low-cost clinics. They also facilitated connections with local support groups for additional emotional and social support.

**Outcomes:** Ms. C improved her diabetes management by utilizing community resources and implementing practical self-management strategies. She achieved better blood glucose control and reported feeling more supported and empowered to manage her condition despite her socioeconomic challenges.

## 7. Discussion

The review underscores the pivotal role nurses play in the management of diabetes mellitus, a chronic condition that requires comprehensive and continuous care. Nurses' contributions span several critical areas, including patient education, medication management, lifestyle interventions, and the integration of emerging technologies. Each of these areas is crucial for improving patient outcomes and mitigating the risk of diabetes-related complications.

### 7.1. Impact of Nursing Interventions

**Patient Education:** Nurses are instrumental in educating patients about diabetes management. By providing detailed information on medication use, dietary guidelines, physical activity, and self-monitoring techniques, nurses empower patients to take an active role in managing their condition. Effective education helps patients understand their disease, adhere to treatment plans, and make informed decisions about their health.

**Medication Management:** Nurses ensure that patients adhere to their medication regimens, address side effects, and adjust treatment plans as needed. Their role in medication management is critical for maintaining blood glucose control and preventing complications.

**Lifestyle Interventions:** Nurses support patients in making necessary lifestyle changes, including adopting healthier diets and increasing physical activity. These interventions are vital for managing Type 2 diabetes and can significantly impact overall health and glucose control.

**Integration of Technology:** The use of technologies such as continuous glucose monitors (CGMs) and insulin pumps has transformed diabetes management. Nurses facilitate the adoption and effective use of these technologies, providing education and support to ensure that patients can benefit from the latest advancements in diabetes care.

## 7.2. Challenges and Areas for Improvement

Despite these advancements, significant challenges remain. **Patient adherence** to treatment plans is a persistent issue, with many patients struggling to follow complex regimens or maintain lifestyle changes. Addressing these challenges requires ongoing support and innovative strategies to enhance patient engagement and adherence.

**Health disparities** also pose a major challenge. Patients from lower socioeconomic backgrounds often face barriers to accessing care and resources necessary for effective diabetes management. Addressing these disparities requires targeted interventions and advocacy to ensure that all patients have equitable access to diabetes care and management resources.

**Resource limitations** further complicate diabetes management. Shortages of healthcare providers, limited access to technology, and inadequate educational resources can hinder effective care. Expanding resources, improving access to care, and leveraging technology are essential for overcoming these limitations [24].

## 7.3. Future Directions

To address these challenges and improve diabetes management, several strategies should be pursued:

- **Enhanced Education and Training:** Ongoing education and training for nurses are crucial to keep pace with advancements in diabetes care and management. This includes staying updated on the latest research, technologies, and best practices.

- **Innovative Adherence Strategies:** Research should focus on developing new methods to improve patient adherence to treatment plans. This may involve exploring behavioral interventions, technology-based solutions, and personalized care approaches.
- **Addressing Health Disparities:** Future research should investigate effective strategies to reduce health disparities in diabetes care. This includes exploring community-based interventions, policy changes, and initiatives aimed at improving access to care for underserved populations.
- **Expanding Access to Technology:** Efforts should be made to increase access to advanced diabetes management technologies. This includes advocating for policy changes, improving affordability, and enhancing availability in underserved areas.

By focusing on these areas, the nursing field can continue to advance diabetes care, ultimately improving patient outcomes and quality of life for those living with diabetes. Continued innovation, research, and advocacy will be key to overcoming current challenges and achieving better management of this chronic condition.

## 8. Conclusion

Nurses play a crucial role in the management of diabetes mellitus, serving as key facilitators of patient care and education. Their involvement is integral to helping patients achieve better blood glucose control, minimize the risk of complications, and enhance their overall quality of life. Through patient education, medication management, lifestyle interventions, and the integration of advanced technologies, nurses empower patients to take charge of their diabetes management effectively.

Despite these efforts, significant challenges persist. Issues such as patient adherence to treatment plans, health disparities, and resource limitations continue to impact the effectiveness of diabetes care. Addressing these challenges requires ongoing commitment to education, research, and innovation within the nursing field.

Continued professional development and research are essential for advancing diabetes care. By exploring new strategies to improve patient adherence, addressing health disparities, and expanding access to technology, the nursing profession can contribute to better management of

diabetes and improved outcomes for patients. As the field evolves, nurses will remain at the forefront, driving progress in chronic disease management and striving to provide the highest standard of care for individuals living with diabetes.

### **Ethics approval and consent to participate**

Not required

### **Consent for publication**

Not applicable.

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