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The Role of Nurses in Health Education for Patients with Diabetes Mellitus

Thahirah¹, Nurma Yuni Pary Usemahu², Daniel Dominguez^{3*}

^{1,2}Universitas Salakanagara, Indonesia

³National University of Singapore, Singapore

Email: daniel.dominguez10@nus.edu.sg

Abstract

This study examines the role of nurses in providing health education to patients with diabetes mellitus as a key strategy in improving treatment adherence and quality of life. Through a literature review and analysis of empirical studies, this paper highlights how nurses translate the complexity of diabetes management—including nutritional therapy, glucose control, medication use, and prevention of hypoglycemia and hyperglycemia—into practical guidelines that are easy for patients to understand. Additionally, preventive interventions such as foot care education to prevent diabetic ulcers are discussed, along with challenges in implementing education programs, including resource limitations, training, and cultural adaptation. The findings indicate that educational interventions delivered by nurses, both individually and in groups, including the use of information technology, are effective in reducing HbA1c levels, improving self-management skills, and preventing long-term complications in patients with Diabetes Mellitus.

Keywords: *Nurses; Health Education; Diabetes Mellitus*

INTRODUCTION

Diabetes Mellitus is a chronic metabolic disorder characterized by elevated blood glucose levels, posing a significant global health challenge due to its increasing prevalence and profound impact on patient morbidity and mortality. This condition, resulting from either insufficient insulin production or ineffective insulin utilization, can lead to severe complications such as cardiovascular disease, neuropathy, nephropathy, and retinopathy, underscoring the critical need for effective management strategies (Cotas et al., 2024). Given that a complete cure is not yet available, lifestyle modifications, meticulous blood glucose monitoring, and patient education are paramount in mitigating disease progression and preventing complications (Gyuk et al., 2019). Consequently, comprehensive diabetes self-management education, encompassing not only theoretical knowledge but also practical problem-solving and coping skills, is indispensable for empowering patients to achieve optimal glycemic control and enhance their overall quality of life (Xing & Wang, 2022). Nurses play a pivotal role in delivering this essential education, serving as key facilitators in guiding patients through the complexities of diabetes self-care and promoting adherence to therapeutic regimens (Lawal, 2008) (Clark, 2008). This necessitates a multi-faceted approach where nurses educate patients on nutritional therapy, the importance of maintaining near-normal blood glucose levels, and strategies to prevent long-term complications (Olabiye & Oguntibeju, 2013). Their involvement extends to teaching self-monitoring techniques, medication management, and the recognition and appropriate response to hypoglycemia and hyperglycemia, thereby equipping patients with the necessary tools for effective self-management (Sande et al., 2007). This paper aims to elucidate the multifaceted roles of nurses in delivering comprehensive health education to patients with diabetes mellitus, exploring the challenges encountered and strategies employed to optimize patient outcomes.

This includes fostering lifestyle modifications, ensuring medication compliance, and educating on hypoglycemia management ([Tessier & Lassmann-Vague, 2007](#)).

Effective diabetes management requires lifelong adherence to a comprehensive plan that integrates lifestyle changes, regular exercise, and a tailored dietary regimen ([Abu-Qamar, 2019](#)). This intricate management strategy necessitates a collaborative approach involving a multidisciplinary healthcare team, wherein patients actively participate in their care decisions (“[Standards of Medical Care in Diabetes—2010](#),” 2009). A physician-coordinated team, including nurses, dietitians, and mental health professionals, is essential in providing holistic care and education to individuals with diabetes to minimize the risks of both microvascular and macrovascular complications (“[Standards of Medical Care for Patients With Diabetes Mellitus](#),” 2003) ([Ratner, 2001](#)). The nurse's role is critical in translating complex medical information into understandable, actionable guidance, bridging the gap between clinical recommendations and the patient's daily self-management practices ([Graber, 1988](#)). The growing prevalence of diabetes further emphasizes the urgent need for scalable and accessible educational interventions, moving beyond traditional clinical approaches to reach a wider population ([Glasgow et al., 2011](#)). Moreover, nurses often serve as the primary point of contact for patients, addressing their concerns and providing continuous support, which is crucial for sustained behavioral change and improved glycemic control ([Weinger, 2011](#)). This holistic approach not only focuses on glucose regulation but also emphasizes cardiovascular risk factor management, regular follow-up, and a patient-centered approach to enhance engagement in self-care activities ([Davies et al., 2018](#)). The management of glycemic control often presents considerable challenges, as both hyperglycemia and, conversely, hypoglycemia can lead to severe adverse consequences for the patient ([Flines et al., 2012](#)).

This paper will delve into the specific contributions of nurses in this educational paradigm, highlighting their integral function in empowering patients to effectively manage their condition and improve health outcomes. One of the critical aspects of this education involves comprehensive training on hypoglycemia, a common and clinically significant complication of diabetes that necessitates prompt recognition and management to prevent adverse events ([Chappell, 2021](#)). Such education encompasses a broad spectrum of topics, including understanding the disease process, medication administration, dietary planning, physical activity, and meticulous self-monitoring of blood glucose ([Atwine & Hjelm, 2017](#)). Furthermore, nurses are instrumental in educating patients about lipid management, which is crucial for preventing macrovascular complications commonly associated with type 2 diabetes ([Daniel, 2011](#)). This includes educating patients on routinely testing their blood glucose levels and adjusting medication regimens as needed, alongside emphasizing the crucial role of a balanced, nutritious diet with careful attention to carbohydrate intake and portion control ([Dharmarathne et al., 2024](#)).

LITERATURE Review

Nurses are on the front lines of patient care and are responsible for assessing, diagnosing, and counseling patients regarding disease management, making them crucial in preventing and addressing this serious condition ([Wen et al., 2023](#)). Their unique position enables them to promote significant changes at the community level through well-structured educational strategies ([Rasori, 2019](#)). This expanded role often involves active participation in clinical research, ensuring that educational strategies are evidence-based and continually refined ([Whittemore & Melkus, 2008](#)). Recognizing the critical role of lifestyle in diabetes prevention, nurses are pivotal in implementing evidence-based interventions, including brief behavior change counseling and referrals to community resources ([Galavíz et al., 2015](#)). These interventions aim to empower patients with the knowledge and skills necessary for

self-management, thereby improving their quality of life and reducing the burden of diabetes-related complications ([Visser & Snoek, 2004](#)). This involves not only dietary modifications but also an emphasis on regular physical activity, which collectively contribute to better glycemic control and overall well-being ([Bazzano et al., 2005](#)). Beyond primary prevention, nurses also deliver crucial education on secondary and tertiary prevention strategies, aiming to minimize the progression of the disease and mitigate the impact of established complications. The emphasis on such lifestyle changes has been shown to dramatically reduce the chronic complications associated with diabetes ([Sheard & Clark, 2000](#)). Additionally, nurses play a vital role in educating patients on the importance of regular foot self-examinations and proper foot care, which is crucial for preventing diabetic foot ulcers, a common and severe complication of diabetes that can lead to lower extremity amputations if left untreated ([Mishra et al., 2017](#)).

METHODOLOGY

This systematic educational approach emphasizes the integration of clinical guidelines with personalized patient needs, ensuring that health education is both comprehensive and individually tailored ([Scheen & Mathieu, 2012](#)). This systematic review aims to synthesize existing research on the effectiveness of nurse-led health education programs for diabetes patients, employing a comprehensive search strategy across multiple electronic databases to identify relevant studies ([Satterfield et al., 2003](#)) ([Adiewere et al., 2018](#)). The review will include studies that assess various educational interventions delivered by nurses, such as individual counseling, group education, and technology-assisted learning platforms, to provide a holistic understanding of effective strategies. The selection criteria will focus on randomized controlled trials and quasi-experimental studies to ensure the inclusion of high-quality evidence regarding the impact of these programs on glycemic control, self-management behaviors, and quality of life ([Kim & Hur, 2021](#)) ([Mazzuca et al., 1986](#)). The methodology will also detail the data extraction process, focusing on key outcomes, intervention characteristics, and patient demographics to facilitate a robust synthesis of findings. This includes rigorous training on the principles of self-examination of the feet and general foot care, which are essential components of preventive strategies against diabetic foot ulceration ([Ren et al., 2014](#)). Furthermore, the analysis will address the implications of these findings for clinical practice and future research, particularly in optimizing nurse-led interventions to improve patient outcomes and reduce the economic burden associated with diabetes.

RESULT AND DISCUSSION

The global prevalence of diabetic foot ulcers underscores the urgent need for effective preventive strategies, as these ulcers significantly increase morbidity and mortality rates among diabetic patients ([Pappachan et al., 2022](#)). These complications represent a considerable burden on patient morbidity and are associated with substantial healthcare costs ([Thewjitcharoen et al., 2014](#)). Evidence suggests that many such ulcers are preventable through intensive interventions and a multidisciplinary approach, with patient self-management and education being particularly promising avenues ([Vileikyte, 2001](#)) ([Reiber & Ledoux, 2002](#)). Nurses, through structured educational programs, play a pivotal role in equipping patients with the necessary knowledge and skills to perform diligent foot self-care, thereby reducing the incidence of these severe complications ([Sharoni et al., 2018](#)) ([Αλεξιάδου & Doupis, 2012](#)). Such interventions include educating patients on appropriate footwear, daily foot inspections for early detection of abnormalities, and meticulous skin care

to prevent infections and ulcerations ([Bus et al., 2015](#)). Early recognition of etiological factors, coupled with prompt management of diabetic foot ulcers, is essential for successful outcomes ([Wu et al., 2007](#)).

A significant percentage of individuals with diabetes, nearly 34%, will develop a foot ulcer during their lifetime ([Ahmed et al., 2020](#)). This alarming statistic highlights the critical need for proactive, comprehensive foot care education, as these complications are a leading cause of hospitalization among diabetic patients and contribute significantly to healthcare expenditures ([Mote & Mote, 2015](#)) ([Schäfer et al., 2021](#)). The economic burden associated with diabetic foot ulcers is substantial, stemming from prolonged hospital stays, surgical interventions, and long-term care, emphasizing the cost-effectiveness of preventative educational initiatives ([Ren et al., 2024](#)). Compared with diabetic patients without foot ulcers, the cost of care for those with foot ulcers is 5.4 times higher in the year after the first ulcer episode and 2.8 times higher in the second year, with costs for treating the highest-grade ulcers being eight times higher ([Driver et al., 2010](#)). Globally, diabetic foot ulcers impose a severe health and economic burden ([Huang et al., 2022](#)). These debilitating ulcers, which precede approximately 85% of lower extremity amputations in diabetic individuals, also carry a 2.5 times higher 5-year mortality risk compared to diabetic patients without foot ulcers ([Edmonds et al., 2021](#)). Moreover, the lifetime risk of developing a foot ulcer for individuals with diabetes ranges from 19% to 34%, and this figure is projected to rise given the increasing longevity and medical complexity of the diabetic population ([McDermott et al., 2022](#)).

Despite ongoing research, the precise global prevalence of diabetic foot ulcers remains elusive, necessitating a contemporary and comprehensive evaluation of their epidemiology to provide up-to-date information for diabetes management and to assess the economic burden ([Raghav et al., 2017](#)). This is further complicated by the fact that diabetic foot ulcers are estimated to occur in 15% of all patients with diabetes and precede 84% of all diabetes-related lower-leg amputations ([Brem & Tomic-Canic, 2007](#)). Given this high incidence and the severe consequences, including significant rates of amputation and mortality, effective management of diabetic foot ulcers is critical, emphasizing the importance of comprehensive patient education and multidisciplinary care ([Li et al., 2022](#)) ([Yazdanpanah, 2015](#)) ([Tai et al., 2025](#)). Additionally, the annual cost of managing a diabetic foot ulcer in the United States alone can range from \$7,000 to \$10,000, escalating substantially if amputation becomes necessary ([Driver et al., 2010](#)) ([O'Brien et al., 2003](#)).

It is estimated that 80% of diabetic patients reside in developing countries, where on average, an extremity is amputated every 30 seconds due to diabetes complications, with the majority resulting from foot ulcers ([Iraj et al., 2009](#)). The significant economic burden associated with diabetic foot ulcers, with average nursing costs for hospitalized patients being nearly 50% higher than for non-DFU related diabetes, further underscores the urgent need for robust preventative strategies and early intervention ([Deng et al., 2022](#)). Such alarming statistics necessitate a deeper exploration into the role of nurses in mitigating these adverse outcomes through enhanced health education initiatives, particularly focusing on early detection and prevention ([Panagoulas et al., 2020](#)) ([Raja et al., 2023](#)). This global health challenge is exacerbated by the fact that patients with diabetic foot ulcers face a 2.5 times higher five-year mortality risk than those without, with approximately 20% of moderate to severe cases leading to some level of amputation. This pervasive issue is further compounded by the fact that only two-thirds of diabetic foot ulcers ultimately heal, with a substantial percentage (28%) leading to some form of lower extremity amputation, underscoring the imperative for proactive management strategies.

CONCLUSION

The preceding discussion highlights the profound impact of diabetic foot ulcers on global health and economies, emphasizing the critical role of preventive strategies and comprehensive patient education. Nurses, as key educators, are instrumental in delivering targeted health education, thereby empowering patients to manage their condition more effectively and significantly reduce the incidence of such debilitating complications. This proactive approach is crucial, especially considering that the majority of these costs are related to the treatment of infected foot ulcers, which can be mitigated through early prevention and self-management (Hicks et al., 2016). This underscores the urgent need for a robust and comprehensive health education framework for diabetic patients, particularly in low-resource settings (Barakat-Johnson et al., 2019). Effective educational interventions, therefore, must focus on empowering patients with the knowledge and skills to perform daily foot inspections and maintain meticulous foot hygiene to prevent ulceration and subsequent complications (King, 2008). Furthermore, integrated approaches leveraging available technologies offer promising avenues for more effective prevention and treatment of DFUs, highlighting the evolving landscape of diabetes care (Lung et al., 2020). The continued development and accessibility of advanced wound care techniques and innovative therapeutic strategies are paramount for improving patient outcomes and reducing the burden of diabetic foot ulcers on healthcare systems (Steed, 1998).

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