Chelonian Conservation And Biology

Vol. 17 No.2 (2022) | https://www.acgpublishing.com/ | ISSN - 1071-8443

DOI:doi.org/10.18011/2022.04(1) 2464.2475

NURSES AS CHAMPIONS IN DIABETIC FOOT PREVENTION: EDUCATION, CARE, AND REHABILITATION

Eidah Mosua Mobarak, Hanan Yehia Qasem, Sultan Abdullah Alhumaydhi, Bashair Hassan Hazazi, Ibrahim Ali Z Al Zamil, Maryam Ali Hazazi, Mohammed Fahad Almutairi, Hamidah Hassan Kamel, Rabab Saeed Aljaizani, Amani Ayidh Alharthi, Fawzia Radaan Albishi, Norah Gassim Khormi, Salha Abdu Joshan, Sarah Mohammed Husain Alanazi, Nawaf Faleh Alotaibe

Abstract:

One non-communicable disease that has consumed a significant amount of money, time, and human resources in health systems is diabetes. These days, the incidence of diabetes and associated consequences have increased due to changes in industrial processes and lifestyle. Consequently, diabetic foot is thought to be a frequent side effect of diabetes. Healthcare professionals who actively participate in diabetes prevention and early detection are nurses. The nursing profession may work in patient care, health care, community education, health systems management, and life quality improvement. Diabetes nurses are educators in the areas of foot care, injury prevention, and diabetic foot prevention. In the care dimension, nurses are in charge of dressing, using new technologies, and promptly identifying any changes in skin and foot sensation.

One of the diabetes nurse's responsibilities in the field of rehabilitation is to assist patients who have been amputated or who have diabetic foot ulcers in moving around. As a result, in order to effectively provide services to support the health of diabetic patients, nurses must undergo specialized training on the most recent guidelines for diabetic foot care.

Key words: diabetic foot, diabetes, nurse

Introduction:

The World Health Organization (WHO) reported that there were 171 million diabetic patients worldwide in 2000 [1], and that figure was expected to rise to 380 million by 2025. Thus, diabetes is currently becoming an epidemic disease in the majority of countries. Evidence of the serious effects of the disorder on medical professionals and the population at large is available [2, 3]. Close collaboration between the health system and its constituents, the development of national and international plans, and communication with other members of the health team are all necessary to solve this issue. According to this method, giving patients and their families

access to sufficient and high-quality healthcare is essential. Enhancing the clinical performance of nurses can also result in changes within client and patient societies [4].

The new therapies may lengthen the lives of diabetics and lower their likelihood of developing long-term issues like kidney, heart, and eye involvement. diabetic foot and also lead to a significant financial strain on the healthcare system [5]. Diabetes complications include a variety of foot issues, including infections and ulcers, which are prevalent and have been on the rise over the last ten years [6]. According to the World Health Organization, diabetic foot is described as foot in diabetics with neurologic diseases, varying degrees of vascular involvement, and metabolic complications of diabetes in the lower extremities. It can also be prone to infection, scarring, and deep tissue damage [7]. According to certain studies, 15% of people with diabetes will develop diabetic foot ulcers at some point in their lives [8–14].

The most common reason diabetic people are admitted to hospitals is for diabetic foot ulcers [15]. However, if the required treatment is not given, these ulcers can result in infection, gangrene, amputation, and even death [16]. Furthermore, extended hospital stays and rehabilitation are linked to lower extremity amputations, and home care and social assistance are also necessary [17]. Overall, patients with diabetes have a lower limb amputation rate that is 10–30 times higher than that of non-diabetics [18, 19]. According to research, one leg is amputated every 30 seconds because to diabetes globally [20]. There is a 50% chance of re-amputation in the first two years following amputation. [21] and 50% of patients may not survive three years following lower limb amputation [22]. In 2001, it was estimated that 3% of Iranians had diabetic foot [23].

It should be mentioned that diabetic foot care is costly everywhere in the world. Twenty percent of all medical resources in affluent nations are dedicated to treating diabetic foot care, with more than 5% of diabetics in these countries having foot ulcers. Put another way, the expense of treating a diabetic foot ulcer ranges from 7000 to 10000 US dollars, and this amount rises by 65,000 US dollars when the ulcer becomes serious and requires amputation [24]. On the other hand, not only are diabetic foot and its complications more prevalent in developing nations, but this illness also accounts for as much as 40% of all medical resources in some cases [25]. Furthermore, this condition has a heavy burden. The burden of diabetic foot was estimated to be 5848 in the study, which was carried out in 2001 to estimate the incidence of diabetes in Iran. By adding the burden of neuropathic diabetic foot, the estimate was raised to 40,000 [26]. It should be remembered that the burden of diabetes retinopathy or nephropathy at the time was two times greater than that of diabetic foot-related neuropathy [26].

Diabetes-related foot ulcers can arise from a number of causes. These elements may raise the chance of developing a foot ulcer, result in skin separation, or hinder the healing process.

Because peripheral neuropathy can lead to increased pressure at specific locations on the foot, ischemia can make the skin more vulnerable to ulcers by impairing peripheral vascular flow. Moreover, diabetics may be more vulnerable to ulcers due to other variables such poor vision, restricted joint movement, inadequate foot covers, and shoes [27–30]. The most crucial finding is that, with the right treatment and education, 85% of diabetic foot amputations can be avoided [31]. The following is the ideal approach for the prevention and treatment of diabetic foot: regular assessment of the foot, identification of the foot that is at risk, patient and healthcare staff education, adequate foot coverage, and early intervention for foot issues [32].
The American Diabetes Association (ADA) protocol states that a multidisciplinary team approach is one preventive strategy in diabetes management, and numerous research have demonstrated its benefits [33, 34]. The interdisciplinary team can lower the rate of amputations [35–41], avoid complications from diabetes, and save costs—1,824 U.S. dollars for the standard therapy group and 1,127 U.S. dollars for the intervention group [42]. According to the results of the study conducted by a multidisciplinary team, the incidence of diabetic foot ulcers after two years was 30% and 58%, respectively, among patients at high risk and in the group receiving standard medication [43]. The individuals on the diabetic foot care team typically.

includes general practitioners, nurses, educators, podiatrists, orthotists, and some consultants, including vascular surgeons, specialists in infectious diseases, dermatologists, endocrinologists, dietitians, and orthopedics. Access to centers and home care services is also required [44, 45]. All members of the team can contribute to lowering the incidence of foot ulcers and amputations [46, 47], but nurses and podiatrists play a crucial role.
In the three domains of education, care, and rehabilitation, this study examined the evaluation function of the nurse as a member of the diabetes care team for the prevention and control of diabetic foot.

Objectives of nursing involvement in diabetic foot care: One of the biggest difficulties facing nurses is improving patient care and health services. As per the World Health Organization, nurses represent one of the most diverse health groups globally, with involvement in various health domains.
Of course, there are a number of reasons why nurses are on the medical team, but generally speaking, the four main objectives are patient care, illness prevention, health promotion, and ease of patient compliance. Nurses might take on a variety of responsibilities to accomplish these objectives. For nurses, there are seven primary roles, which include: 1. giving medical attention, 2. connection for care, 3. teacher, 4. consultant, 5. the head, 6. investigator, 7. supporting patients' rights [48].

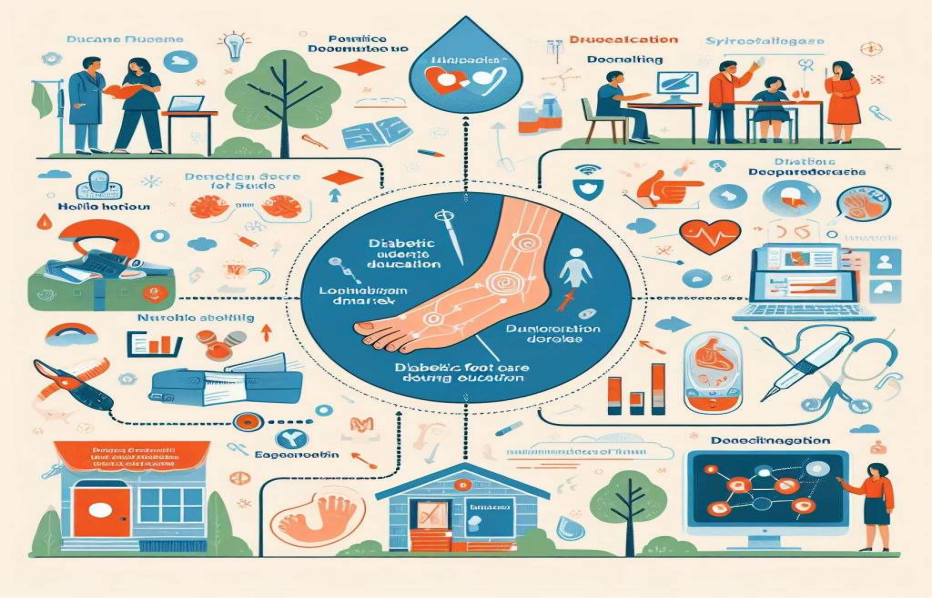
In order to give patients with health services and try to eliminate their physical, emotional, mental, social-cultural, and spiritual demands, nurses integrate science and art. Since providing care for patients comes first, nurses play a crucial role in the management of diabetes in

developed nations. Diabetes nursing is broken down into several categories, such as generalist nursing, clinical nurse specialist, nurse practitioner, and diabetes nurse, and each has specific responsibilities. A nurse practitioner, for instance, concentrates on patient education and consultation as well as health promotion and disease prevention activities [49].

There is an indisputable need to train nurse specialists in this area given the rising prevalence of diabetes and associated comorbidities. Reducing the frequency of foot ulcers and amputations in diabetes patients was thought to be one of the primary goals of the Healthy People 2010 initiative because of how significant the diabetic foot is. Therefore, a 55% decrease in amputations and a nearly 75% rise in diabetic foot exams were the goals [50, 51].

The function of nurses in education

It has been noted that nurses can effectively prevent lower limb amputation and foot ulcers by screening high-risk individuals, delivering healthcare, and implementing educational interventions [52]. It is essential for everyone to Patients with diabetes should understand the fundamentals of foot care, especially those who are at risk for developing foot ulcers. Numerous research indicates that educating patients about proper foot care can effectively prevent diabetic foot ulcers [53–55]. Patients might learn from nurses how to examine themselves physically and take daily care of their feet [56]. Nurses, for example, might advise patients to follow a few easy guidelines to help avoid foot ulcers or their recurrence: wearing shoes that are checked before, keeping feet clean, and maintaining nail and skin care routines. It's also crucial to receive training on selecting appropriate footwear [57].



Programs for teaching people about diabetic foot care have been proposed [58], taking into account the implications of continuous education, which are outlined in Table 1 [59–61]. On the other hand, nurse educators are able to assess patient needs and create a customized educational plan for every patient as well as their family [33]. In addition to teaching patients the value of routine clinic visits, scheduled blood tests, and the fundamentals of diabetes management and complication prevention, nurses can help patients and their families take an active role in their treatment.

Furthermore, proper blood sugar control is essential to minimizing neuropathy and enhancing the quality of life for people with diabetic neuropathy, as hyperglycemia is a modifiable risk factor. Therefore, patients who have trouble controlling their blood sugar should receive extra care and useful information [62]. This highlights how crucial it is for nurses to create all-encompassing educational programs. Patients should receive training based on the severity of their diabetic foot issues in addition to learning the appropriate lifestyle [47].

In light of the aforementioned, health care providers' education is an important concern. Moreover, the majority of the time,

They don't know about any efficient therapies. Put another way, diabetic foot teams require training for their essential members, the nurses, in addition to patient education. Its primary objectives are to raise staff knowledge of the dangers associated with diabetic foot ulcers and to enhance their abilities in diagnosing and treating diabetic foot [41].

The function of nurses in healthcare Inspection and vetting :

The three main causes of diabetic foot ulcers that can result in gangrene and amputation are peripheral neuropathy, peripheral vascular disease, and infection [63]. However, among people with diabetes, peripheral neuropathy is the only cause of more than 80% of foot ulcers. This is significant for neurological examination as the primary criterion for identifying patients at risk for developing pressure ulcers in their feet [23]. It also subtly highlights the role of the nurse in conducting a diabetic foot examination using monofilament and working in conjunction with other members of the diabetic foot team.

Early on in the course of care and therapy, nurses with a focus on foot care are involved [64]. In addition to wound dressing [33], foot examinations, and routine follow-up visits [65, 66], nurses play a crucial role in the management of diabetic foot patients. The main objectives of screening are to discover diabetic foot issues early, identify individuals who are at risk, and make plans to lower the incidence of ulcers [67].

Every consultation should include a diabetic foot examination. In order to screen patients at high risk and report to other members of the multidisciplinary diabetic foot team [71], nurses should urge patients to take off their shoes and socks [68–70]. After that, they should examine the patients' feet.

Ankle brachial index (ABI) and toe pressure are two tools that nurses may use to assess vascular status in a diabetic foot specialist clinic. In addition, the pedography system and thermometer are

used to measure the temperature and sole pressure of the foot [72, 73], allowing for the identification of foot problems and the degree of diabetic ulcer risk.

cooperation of nurses in the treatment of diabetic foot Complementary treatment, such as choosing the right dressing based on the type of ulcers, should be another responsibility of a nurse in order to give optimal diabetic foot care. Choosing the right dressing depends on whether the wound is wet or dry. Dressings serve to keep the wound clean and moisturized while also reducing the amount of bacteria and aiding in debridement [74, 75]. The awareness and understanding of nurses in this profession regarding the range of innovative dressings needs to be improved.

The role of nurses in at-home diabetic foot care

The care plan for diabetic patients includes follow-up at predetermined intervals, which is something that should be prioritized.
As a result, annually, all diabetics should be sent to the diabetes clinic for a full evaluation for diagnostic and treatment of their feet [34].
Some diabetic patients find it challenging to take care of their feet on a daily basis, particularly those who have low vision from diabetes or other chronic conditions and may not be able to assess their feet.
Foot care might be challenging due to peripheral vascular dysfunction, reduced foot sensation, and delayed wound healing. Nurses should assess these problems during both home visits and clinic visits.
When evaluating a patient's feet, diabetic foot nurses should have filled out the initial patient evaluation form and checked the patient's limb movement, health, moisture, color, temperature, edema, discomfort, and sensibility [48].

The importance of nursing in recovery

Assisting patients with diabetic foot ulcers to move about is one of the nurses' responsibilities. This is crucial, particularly for individuals who have lost a foot. Patients should be taught how to use assistive equipment by nurses [76–78]. In order to preserve patients' mobility, nurses should be able to recognize various gadget kinds and their uses in order to introduce them to patients based on their individual circumstances.
A diabetic foot nurse's responsibilities, for instance, might include introducing, training, and assisting patients in using equipment like wheelchairs, canes, and walkers, which completely relieve pressure on the limb, as well as effective foot-pressure-relieving shoes, boots, Scottish stones, full contact plaster, and plaster walkers [79].

One of the issues facing the health system is diabetic foot, which is the primary cause of

hospitalization in patients with diabetes. In order to prevent and diagnose diabetic foot issues, diabetes healthcare providers devote the majority of their time to these tasks. To effectively support the health of diabetic patients, nurses as members of the diabetes care team must not only fulfill their duties in patient care, public education, health system management, and health care, but they also need to participate in specialized training to apply the most recent guidelines for diabetic foot care.
The training of specialized nurses, such as diabetic foot or diabetes, has not been fully considered in our country, despite the rise in the number of diabetic patients. It appears that creating brief nursing education programs and implementing clinical guidelines and algorithms for diabetic foot care in clinics and hospitals

The emphasis on diabetes and foot care could be momentarily raised in addition to ongoing instruction regarding cutting-edge methods. Furthermore, this worldwide issue might be lessened by the variety of programs offered, such as the Master of Sciences in Nursing, which develops diabetes specialist nurses and advances electronic health.
Endocrine and Metabolism Research Institute of Tehran University of Medical Sciences has created a diabetic foot clinical guideline, translated the clinical care guidelines, developed a diabetic foot section of the virtual clinic for diabetes education [80], designed a diabetic foot website [81], and established a network of diabetic foot clinics to provide the diabetic foot care team, which includes nurses, with these educational resources.

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