Diabetes self-management education: Benefits and challenges

ABSTRACT

Diabetes mellitus has spread throughout many nations of the world and is now a serious threat. A lack of patient self-management has been linked to this drain on global health. The consequences of diabetic patients' poor self-management have increased a variety of complications and lengthened hospital stays. Poor information and skill acquisition have been linked to poor self-management. Participating in a co-operative approach known as diabetes self-management education will help diabetes patients who want to successfully self-manage their condition and any associated conditions. Information is one of the most important components of a diabetes management strategy. In conclusion, numerous studies have shown that patients with diabetes have poor self-management skills and knowledge in all areas, making training in diabetes self-management necessary to minimize the complications that may result from diabetes mellitus among the patients. This review discussed the severity of diabetes mellitus, diabetes self-management, and the benefits and challenges of diabetes self-management, which may aid individuals in understanding the significance of diabetes self-management and how it relates to diabetes self-care.

Keywords: Diabetes, diabetes self-care, diabetes self-management, diabetes self-management education and support, education

INTRODUCTION

Diabetes mellitus is referred to as a "silent" illness.[1] The incident may start slowly and progress asymptomatically before developing into other problems.[2-4] With 220 million diabetics worldwide, DM is a significant public health issue. Eighty percent of diabetes-related fatalities take place in low- and middle-income nations.[5,6] According to the reports by Henry *et al.*,[7] Swain *et al.*,[8] and Anderson and Durstine,[9] the number of deaths from diabetes will double between 2005 and 2030, and the condition has a significant financial impact. Diabetes mellitus has spread throughout many nations of the world and is now a serious threat. Deficits in patient self-management have been linked to this global health drain. Poor self-management has increased various complications and has been linked to a lack of knowledge and skill acquisition.[10]

A healthy diet, regular exercise, self-monitoring blood glucose (SMBG), foot care, and quitting smoking are all actions that are part of diabetes self-management education (DSME), which is crucial for maintaining disease control.[11-14] SMBG and foot care require sufficient skill, which can be acquired through in-depth familiarity with these practices.[12,15] Participating in programs for education and support on diabetes self-management offered by consumer health organizations and medical professionals may significantly improve a person's ability to control their diabetes.[16-18] According to previous studies, the purpose of DSME and diabetes self-management support is to create the opportunities for people with diabetes to learn about and be motivated

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to practice excellent diabetic self-management behaviors throughout their lives.[17,19,20]

CONCEPTUAL CLARIFICATION AND BACKGROUND

The name "diabetes mellitus" comes from the Greek words "diabetes," which means to siphon or traverse, and "Mellitus," which means sweet or honey in Latin.[21] Diabetes is a chronic condition caused by either inadequate insulin production by the pancreas or improper insulin utilization by the body.[22-24] Insulin is a hormone produced by the pancreas that regulates blood sugar levels by helping glucose enter cells for energy production.[25-27] The studies of exploring the effect of insulin resistance explained that insulin resistance is a common occurrence in people with type 2 diabetes because they have less sensitivity to insulin than healthy individuals do.[24,26] By implication, when there is insufficient insulin available or when cells do not take up enough glucose, blood sugar levels rise into diabetic territories: When this happens too frequently, it can lead to diabetes complications such as cardiovascular disease (CVD) and stroke.[26] Meanwhile, McIntyre *et al.*[28] and Forouhi and Wareham[29] observed that the primary risk factor for developing diabetes mellitus is age. However, Saravanan *et al.*[30] and Pinchevsky *et al.*[31] mentioned that even young children can be diagnosed with diabetes at high risk if they have other conditions such as obesity or a family history of diabetes.

In countries with middle- and low-income levels, the prevalence of diabetes has been rising more quickly. Statistically, currently, diabetes affects over 422 million people worldwide as opposed to 108 million in 1980.[32-34] According to Alshehri *et al.*[35] and Wright *et al.*,[36] overly high blood glucose levels contributed to an additional 2.2 million fatalities in 2012. Diabetes prevalence among people older than 18 has increased globally, from 4.7% in 1980 to 8.5% in 2014.[37,38] In 2016, 1.6 million deaths worldwide were estimated to have been directly related to diabetes.[39] And also globally between 2018 and 2022 about half of all deaths occur before the age of 70 as a result of high blood sugar levels.[40] More emphatically, Shah *et al.*[41] and Vassalle and Gaggini[42] mentioned that diabetes is the ninth most common cause of death between 2019 and 2022 worldwide. By the year 2030, the number of people with diabetes mellitus is expected to reach over 350 million globally.[43-45]

From the foregoing, it is invariably evident that the prevalence of diabetes milletus is increasing globally. According to Forouhi and Wareham[29] and Saravanan *et al.*,[30] the aging of the population and urbanization could be contributing factors. The estimated increase in prevalence is anticipated

to be greater in regions with abrupt epidemiological change, like Africa and Asia.[46,47] While traditional rural communities still have lower rates of diabetes mellitus than urban environments, estimated that 15.5 million adults in the African region had diabetes in 2017, which corresponds to a regional prevalence of 3.3%.[48] The highest diabetes prevalence in the area was among adults aged 55–64 according to Mapa-Tassou *et al.*[48] and the region has the highest rate of undiagnosed diabetes, with more than two-thirds (69.2%) of those who are currently experiencing the disease unaware of their condition. According to Saeedi *et al.*[49] and Al-Rifai *et al.*,[50] urban residents with diabetes make up more than half of the population (55.3%) in the African region. The most populous countries in Africa with the highest rates of diabetes are South Africa (1.8 [1.1–3.6] million), Nigeria (1.7 [1.2–3.9] million, the Democratic Republic of the Congo (1.7 [1.4–2.1] million), and Ethiopia (2.6 [1.1–3.8] million.[51,52] Appropriately 45.1% of diabetics in the region between the ages of 20 and 79 reside in these four nations. In Nigeria, the prevalence of diabetes mellitus has increased. The south-south geopolitical zone has the highest prevalence, but the entire country has been affected.[53] The prevalence of diabetes mellitus was 5.77% overall. The combined prevalence of diabetes mellitus was 3.0% in the north-west, 5.9% in the north-east, 3.8% in the north-central region, 5.5% in the south-west, 4.6% in the south-east, and 9.8% in the south-south region of Nigeria.[54]

As observed by Saeedi *et al.*[49] and Al-Rifai *et al.*,[50] living in the city, not exercising, getting older, and eating poorly are all significant diabetes mellitus risk factors for Nigerians. Long-term complications are more likely with all types of diabetes. These take many years (10–20) to manifest, but in people who have not received a diagnosis yet, they could be the first symptom. The main chronic problems are brought on by blood vessel damage.[5] Diabetes doubles the risk of CVD, and coronary artery disease is responsible for about 75% of diabetic deaths. Two additional "macrovascular" conditions are peripheral vascular disease and stroke. Among the most significant microvascular effects of diabetes is harm to the eyes, kidneys, and nerves. Diabetic retinopathy, or damage to the blood vessels in the retina of the eye, results in eye damage that may eventually lead to blindness.[55] Nephropathy, or damage to the kidneys, may result in tissue scarring, protein loss in the urine, and ultimately chronic kidney disease, which may necessitate dialysis or kidney transplantation.[55] Diabetic neuropathy, a side effect of diabetes that damages the body's nerves, is one of its more common manifestations.[56] Skin damage can result from the symptoms, which include tingling, numbness, discomfort, and altered pain perception. Diabetic foot problems, such as diabetic foot ulcers, can occur, are occasionally challenging

to treat, and occasionally require amputation. Furthermore, painful muscle atrophy and weakening are the side effects of proximal diabetic neuropathy.

THE BURDEN OF DIABETES MELLITUS

Diabetes is a group of diseases in which high blood sugar levels cause changes in metabolism that result in inadequate production or use of insulin by the body's cells for energy or for use as needed energy sources (glucose).[22,24] Insulin is a hormone produced by beta cells in the pancreas. In people with diabetes, these cells do not produce enough insulin because they do not respond normally to it.[23] A person's risk of developing diabetes depends on several factors including ethnicity, age (people over 60 years old are at higher risk), family history, and lifestyle choices such as diet and exercise habits.[21] The disease can lead to many complications, including heart disease, stroke, kidney failure, and blindness. In many countries where there are high rates of diabetes mellitus, it has been shown that patients who have had a cardiac event associated with diabetes mellitus have a higher risk of death after their initial event than those without such events.[19,24]

In addition to its devastating effects on individuals' lives, T1D also has a huge economic impact on society at large because those living with this disease require lifelong treatment with medications that cost over $15 billion per year ($10 billion in medical care costs alone).[25] According to some estimates,[57-59] 70%–80% of people in Africa go undiagnosed or untreated. According to Razzaque *et al.*,[60] Alakaloko *et al*.,[61] and Painter *et al*.,[62] at the time of presentation to secondary and tertiary health-care facilities, there is significant morbidity and mortality as a result of the disease's progression to an advanced stage and its incapacitating consequences. The rising prevalence of this condition resulted in an increase in the records of heart failure, stroke, erection issues, kidney disease in its advanced stages, and lower extremity amputations, which prolong hospital stays and increase health-care costs, thus being a heavy burden on the health budget of most countries.[25]

CLASSIFICATION OF DIABETES MELLITUS

According to Mukhtar *et al*.,[25] insulin-dependent diabetes mellitus (IDDM), also known as type 1, and non-IDDM, also known as type 2, are the two main types of diabetes. This classification is also in alignment with the classification by the American Diabetes Association.[63,64] Following the classification, Type 1 diabetes is caused by cell death and is typically characterized by an absolute lack of insulin while Type 2 diabetes is caused by a gradual malfunction in the insulin secretory pathway, which is accompanied by insulin resistance.[63,64] The immune system of the body attacks the beta cells in the pancreatic islets, which produce insulin, resulting in type 1 diabetes. An absolute or relative insulin deficit results from the body producing little to no insulin. Although type 1 diabetes can appear at any age, it most frequently strikes children and adolescents. Although type 1 diabetes is becoming more common worldwide, there are notable regional variations and the incidence varies greatly by country. Type 2 diabetes is the most prevalent type, accounting for about 90% of cases. The prevalence of type 2 diabetes is rising globally and is becoming more common. This increase is probably due to an aging population, economic expansion, and growing urbanization, which encourage sedentary behavior and higher consumption of unhealthy foods linked to obesity.[29,30]

Another classification of diabetes is gestational diabetes. A woman may be diagnosed with gestational diabetes mellitus (GDM) in the second or third trimester of pregnancy.[65] GDM is a type of diabetes that is not immediately apparent, such as cystic fibrosis, conditions affecting the exocrine pancreas, monogenic diabetes syndromes (such as neonatal diabetes and maturity-onset diabetes of the young), and chemically or drug-induced diabetes (such as when treating HIV/AIDS or after organ transplantation).[66] According to Powe and Kwak,[67] type 2 diabetes and GDM share several characteristics, including an insufficient balance of insulin secretion and response. According to estimates, GDM affects between 75% and 90% of pregnant women who experience high blood sugar levels (GDM).[66] Although it can happen at any point in the pregnancy, pregnant women with GDM, typically experience symptoms in the second and third trimesters. GDM is brought on by decreased insulin action as a result of the placenta's hormone production.[66] Recently, type 2 diabetes has been proven to be immune-mediated, slowly progressing, and prone to ketosis; monogenic diabetes, which can be brought on by disorders of insulin action or beta-cell function; conditions affecting the exocrine pancreas; drug- or substance-induced diabetes.[29,30,65]

DIABETES MANAGEMENT EDUCATION

Components of diabetes management education

The best people to manage a disease that is affected by daily changes in environmental stress, exercise, diet, and infections by patients and their families. According to Alhumaidi[68] and Cimmino *et al*.,[69] DSME is an important nondrug method of managing diabetes and is used in conjunction with medication therapy. The following are the DSME components listed in the

Nigerian diabetic management recommendations: (1) SMBG: Patients and family members should be educated on how to modify therapy based on blood glucose findings, including how to modify insulin doses, diet, and exercise in response to blood glucose measurements.[21,64] At every clinic visit, these abilities are to be assessed. (2) Foot care: Patients are instructed to regularly examine their feet, wear comfortable, snug-fitting shoes, take good care of their nails, preferably by filing them, and refrain from walking barefoot.[12,64] (3) Exercise: Exercise is recommended by the guidelines to prevent type 2 diabetes mellitus; aerobic or endurance exercise, such as walking or running, is also advised.[13,14] However, strenuous exercise should be avoided if blood sugar levels are higher than 250 mg/dl (14 mmol/L) or lower than 80 mg/dl (4.5 mmol/L).[21] (4) Dietary management: The prescription for a diet is supported by the following recommendations: Carbohydrates (60%–70%), protein (20%–25%), and fat (15%–20%).[70] A food pyramid for diabetics should be used to explain the correct dietary guidelines.

Self-management of diabetes mellitus

By becoming more accustomed to managing the complexity of diabetes in a social setting, diabetes self-management can help increase knowledge through evolution or awareness. This is because patients and/or families handle the vast majority of daily diabetic care.[64] Previous studies had shown how beneficial it was for people to control their diabetes. It demands a multidisciplinary approach with full patient participation.[12-14,17,21,64,65] This strategy includes therapeutic medical nutrition, quitting smoking, foot care, and SMBG to help lessen the burden of the diabetes epidemic globally.[17] For the management of diabetes, SMBG is crucial.[13,15] Numerous benefits of SMBG have been established, including how well it helps with severe hypoglycemia forecasting, lowering glucose variability, and achieving hemoglobin A1c (HbA1c) goals.[71] Furthermore, SMBG can improve patients' comprehension of the condition and how lifestyle decisions affect blood sugar levels.[19]

Although physical activity has significant metabolic benefits, these benefits are only temporary and begin to fade after 48–96 h.[72] Therefore, a consistent exercise routine is required to maintain the favorable metabolic environment that can be achieved through exercise.[26,72] More intense exercise has been shown to improve HbA1c and cardio-respiratory fitness, which reflects greater improvements in blood glucose control. Foot care is essential when managing diabetes, especially for those who have sores, scrapes, or ulcers on their feet, as well as numbness, tingling, or structural changes to their feet.[73]

Diabetes education and self-management programs

According to Pearson *et al.*,[74] diabetes education is a basic tenet of the behavioral medicine model. The focus of education is to help patients understand their disease and how they can manage it. It also provides tools for self-management, which includes planning and adherence to daily life activities.[75] There are many diabetes education programs available,[76-79] but each is tailored to meet the needs of its audience. For example, some programs are tailored to people who are new to the disease, while others are designed for those with a long history of diabetes. There are also different types of self-management programs that focus on different types of patients. These include self-monitoring (such as testing glucose levels),[76] diet management (such as meal planning),[76,77] exercise management (such as setting goals for physical activity),[77,78] and pharmacological management (such as taking medication).[79]

According to Adu *et al.*,[75] the first step in the management of diabetes is education. People with diabetes must understand the disease, how they can prevent it, and what they can do if they already have the disease.[77] Many people with diabetes are unaware of their condition and may not even know that they have it until they experience symptoms such as high blood sugar levels or fatigue. In addition to helping people recognize their condition, education programs also help them understand how to manage blood sugar levels by limiting their intake of foods high in carbohydrates, monitoring blood glucose levels regularly, taking medications as prescribed by their doctor, exercising regularly, and maintaining a healthy weight.[79] To achieve these goals, individuals with diabetes must be able to monitor their conditions effectively through regular testing. This can be done through self-monitoring or using devices such as computerized tablets or smartphones that provide real-time feedback about blood glucose levels[76]

Patient education aims to improve the knowledge, skills, and self-assurance of people with diabetes so they can better manage their condition and take back control of their lives.[80] High-quality planned education has a significant positive impact on health outcomes and life quality. Techniques for self-management of diabetes must be embraced by diabetics for them to feel ownership over the treatment of their condition. Giving people timely information and direction that acknowledges and takes into account their situations could support this (e.g. disease duration and prior experience in diabetes management).[77]

Providing diabetes education and support

DSME and support (DSMES) has previously been made accessible through a structured program that involves patients and their families in an outpatient service offered at a hospital or healthcare facility.[81] To meet the demands

of primary care and adjust to changing healthcare delivery systems, DSMES is now being implemented in office settings, medical homes, and accountable care organizations. Receiving DSMES in increasingly accessible and practical locations, like pharmacies and community health centers, as well as through technological initiatives, is becoming more widespread. No matter the situation, encouraging excellent self-management and coping skills for living with diabetes daily requires a thorough and tailored approach when imparting knowledge and auxiliary skills. However, for effective delivery, clinical, social, and behavioral diabetes treatment experts are required.[82] The health care team, which consists of a provider, an educator, and a person with diabetes, must effectively communicate and collaborate to ensure that goals are clear, that progress toward goals is being made, and that appropriate interventions (educational, psychosocial, medical, and/or behavioral) are being used. Patient-centered DSMES treatment establishes the foundation for current and future needs at the time of diagnosis. Continued DSMES can assist the person in overcoming challenges and juggling ongoing commitments to support adjustments throughout the therapeutic process and life transitions.[82]

Benefits of diabetes self-management

The benefits of diabetes self-management are many. The first and most important benefit is that it improves overall health.[75] When people with diabetes manage their condition, they reduce the risk of heart disease, stroke, and cancer. They also reduce the number of medications they need to take to stay healthy. Diabetes self-management can also help prevent hypoglycemia (low blood sugar) episodes.[82] Hypoglycemia is when a person's levels of glucose (sugar) in their blood are too low to meet their body's needs for energy. If this happens, it can cause symptoms such as dizziness, confusion, and sweating. This is why it is important for people with diabetes to monitor their blood sugar levels regularly. A person who manages his or her own diabetes can do this by eating foods that contain carbohydrates and doing physical activity on a regular basis.[80]

Furthermore, diabetes self-management reduces long-term complications from the disease just as it can help prevent CVD.[83] According to Gao *et al*.,[84] CVD is one of the leading causes of death in both men and women-and if left untreated, CVD can lead to heart attack or stroke. In fact, one study found that people with diabetes who practiced self-management had a lower risk of developing CVD than those who did not practice self-management techniques.[85] Moreover, the American Diabetes Association has found that people who practice self-management have a lower risk of dying than those who do not.[63,64]

Additionally, self-management education has been found to lower the risk of heart disease.[86] Diabetes is a risk factor for heart disease because it puts pressure on the heart muscle. By controlling blood sugar levels through diet and exercise, the risk of heart disease can be reduced by 10 percent.[86,87] Accordingly, diabetes self-management practices can reduce the risk of kidney disease.[87] Kidney disease is another common complication of diabetes caused by high blood pressure and high cholesterol levels from excess insulin production over time. A good diet combined with regular exercise will help reduce this risk as well.[87] Overall, a connection between DSME and clinically significant benefits in diabetics, like drops in glycated hemoglobin, cardiovascular risk factor reductions as well as improvements in foot ulcerations, infections, and amputations has been shown in numerous studies (A1C).[63,64,85,87]

According to claims made about DSMES, it improves life quality and lifestyle decisions like eating better and exercising frequently, slows the onset and/or progression of diabetes problems, boosts self-efficacy and empowerment, encourages healthy coping, and lessens depression and sadness associated with diabetes.[31,23,84] These improvements categorically prove the importance and value-added benefit of DSME. Studies have shown that longer sessions with a diabetic educator are linked to better outcomes. Self-management skills can be encouraged by setting behavioral goals. Shortly, diabetes education can improve clinical outcomes and quality of life. From primarily didactic presentations to one that is more theoretically based, DSME's empowerment strategy has evolved. While there is not a single "best" educational strategy or program, those that incorporate behavioral and psychosocial strategies perform better.

Factors affecting diabetes self-management

One of the problems affecting self-management, according to a review of diabetes self-management in Africa, is a lack of education and training.[88,89] Healthcare professionals may lack knowledge or understanding due to low literacy rates or a lack of education. Programs for managing diabetes by individuals are not well-established in many African healthcare facilities.[89] It might be challenging for people with little education to understand the pathophysiology of the illness and how to treat it.[88] One of the potential causes of poor self-management was found to be a lack of knowledge and skills in a study among people with diabetes in Ethiopia on self-care practice and associated factors.[90] It was found that about half of the respondents had poor self-management practices. This is consistent with another study that found it would be challenging to provide effective diabetes therapy without a thorough understanding of the condition's various self-management domains.[91] Studies done in Nigeria also

revealed that diabetes patients generally lack knowledge and skill regarding self-management;[53,54] therefore, the development of educational intervention programs is required to lessen complications in these people.[90]

In a study on diabetic patients' self-care practices and related variables in Ethiopia,[90] it was discovered that about half of the respondents had subpar self-management techniques, with a lack of knowledge and experience being one of the possible explanations. This is consistent with other studies that found that effective diabetes therapy will be difficult without adequate comprehension of many domains of self-management of the illness.[92-94] Poor understanding of the illness, its risks, and its challenges have been linked to factors influencing attitudes and practices toward self-care.[93] Invariably, there is a positive correlation between medication adherence and medication knowledge. Unfortunately, most patients do not know that diabetic medications had to be taken for the rest of their lives,[95] and some think that diabetes might be cured after taking anti-diabetic drugs for a while along with using herbs and other complementary therapies.[96] More painfully, most diabetic patients who have hypoglycemia symptoms usually mistake them for hyperglycemia due to their lack of understanding of either of the two complications.[97]

Furthermore, while most patients understand the benefits of regular exercise, many do not know that blood sugar levels should be monitored before and after such activity or that anti-diabetic medication should be adjusted after exercise.[97] Additionally, there is misinformation regarding physical activity, leading diabetics to believe that exercise is intended to help them lose weight rather than keep fit.[98] All these and many factors are barriers to the effectiveness of DSME.

Implications for nursing practice

The growing body of literature has demonstrated the benefits of diabetes education and self-management programs for nursing practice. Many studies have shown that nurses who participate in these programs are more likely to have better glycemic control and lower blood glucose levels, as well as improve patient satisfaction with care.[64,69,92,94] These programs also help nurses develop skills in diabetes knowledge and management such as understanding basic concepts about diabetes, including its causes, symptoms, and treatment options, learning how to assess patients' risk for developing complications from diabetes, understanding how to monitor patients' blood sugar levels, and learning how to recognize the signs of complications from diabetes.

In the past decades, there has been a sharp rise in the prevalence of diabetes. This prevalence of diabetes is rising not only because of an increase in population but also because people are becoming more obese and sedentary.[37,48] With these trends in mind, it is no wonder that nursing science is focusing more attention on this subject matter. Nurses should be prepared with knowledge about how to manage diabetes care; however, it can be difficult for them to acquire this information on their own due to its complexity and breadth.

Consequently, it is crucial that nurses who are responsible for delivering high-quality care mobilize efforts to remove obstacles and look into options for DSMES to meet the needs of those who manage and live with people who have diabetes.[94] A nurse should identify patients who might disobey instructions so they can get extra attention. Nations need to implement effective DSME programs at the primary care level, with a focus on motivating positive self-care behaviors, especially lifestyle modification.[92] These programs should also be used repeatedly; behavior modification, and long-term behavior maintenance require ongoing reinforcement. Family members and appropriate social support networks must be arranged when these educational programs are being planned.[21,64] It is also crucial that the hospital management board and nursing departments implement the necessary measures to improve nurses' capacity to health-educating diabetic patients, as doing so will improve the quality of life for diabetic patients and invariably increase nurses' job satisfaction.

While diabetes education and self-management programs have the potential to improve the quality of nursing practice. However, there are several issues that must be addressed before these programs can be used in nursing education and clinical settings. The first is that the current state of diabetes management is not conducive to a healthy lifestyle.[99] Many people with diabetes do not understand the importance of diet, exercise, and weight control in their daily lives because they believe that they are healthy or because they do not want to make any changes. They may also have been taught that they are fine if they eat unhealthy foods without gaining weight or having any other symptoms. This can lead to serious health problems in these individuals once they become diabetic because their bodies cannot metabolize sugar properly.[92]

Another important thing to consider involves how healthcare providers deal with patients who have diabetes. Some doctors are unaware of how essential it is for them to educate patients about their disease; others find it difficult to communicate with patients about their condition effectively.[100] There are also many nurses who feel uncomfortable discussing diabetes management with their patients because it can seem intrusive

or even offensive. Improving these areas will help ensure that all members of society receive proper education regarding this condition so that everyone can be treated ethically and respectfully by healthcare professionals.

CONCLUSION

Diabetes is a major health issue in the United States and around the world. It causes damage to the body's organs and can lead to heart disease, stroke, blindness, kidney failure, amputation, lower-extremity amputation, foot ulcers, and premature death. The significance of diabetes self-management in curbing this menace was highlighted in this review. It summarized the evidence that shows that nursing interventions can improve health outcomes for patients with diabetes. It also discussed how these programs can be beneficial to increase nurses' knowledge about diabetes and help them develop skills to manage it. The review also analyzed some of the barriers to implementing these programs in hospitals and suggested ways to overcome them. Overall, since a barrier to managing diabetes by individuals is a lack of knowledge, the importance of clinicians (nurses) in promoting self-care must be emphasized. Encouragement of diabetic patients to practice self-care is essential for avoiding any long-term issues given the complexity of the situation. This necessitates a methodical, comprehensive, and integrated approach.

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