



SELF-CARE BEHAVIOUR: THE LIFE-CHANGING MAGIC IN TYPE 2 DIABETES MELLITUS CARE

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ABSTRACT: *Diabetes Mellitus is a 'silent disease' with minimal symptoms at the beginning and rapidly progresses until target organ damage. Moreover, because of its serious consequences, it has become a significant public health concern. Though genetics play an essential role in the development of diabetes, studies on monozygotic twins have shown the importance of environmental influences. Diabetes education is essential but must ultimately be transferred to action to benefit the patient. Individuals with diabetes have been shown to dramatically impact their disease's progression and development by participating in their care. Because a high percentage of the world's diabetes cases belong to Type 2 Diabetes (T2D) with modifiable risk factors such as an unhealthy diet, being obese or overweight, a sedentary lifestyle, and smoking, therefore, individuals with T2DM can be helped to modify these factors through behavioural changes to achieve and maintain optimum blood glucose levels.*

KEYWORD: Type 2 diabetes mellitus, Diabetes self-care behavior, Determinants of diabetes self-care behaviors, Role of nurses.



INTRODUCTION

Diabetes is a chronic disease caused by the pancreas not producing enough insulin or the body not using it effectively, leading to hyperglycaemia, which can lead to serious damage to the body's systems, especially the nerves and blood vessels. Approximately 537 million people (20–79 years of age) suffer from DM globally, and it is projected that the total number of people who have diabetes may rise to 643 million by 2030 and 783 million people by the year 2045. The developing countries seem to be the worst-hit countries with diabetes mellitus, as statistics show that 3 in 4 adults with diabetes reside in low- and middle-income countries, and almost 1 in 2 (240 million) adults with diabetes are undiagnosed. An estimated 19 million adults live in Africa, which is estimated to increase to 47 million by 2045 (Saeedi et al., 2019). Greater than 1.2 million children and adolescents (0-19 years) live with type 1 diabetes, and approximately diabetes affects 1 in 6 live births (21 million) during pregnancy. Also, 541 million adults are more likely to develop type 2 diabetes (International Diabetes Federation, 2021).

The nationwide health (Diabetes) survey in Nigeria conducted in 1992 revealed a diabetes mellitus (DM) prevalence of 2.2%. However, according to IDF (2022), the prevalence of DM among adults aged 20–69 years was reported to be 3.7%, amounting to 3,623,500 total cases of adults with Diabetes (International Diabetes Federation, 2022). These prevalence figures reported by the IDF may have grossly under-report the actual burden of DM in Nigeria, given that they may have been derived through extrapolating data from other countries. However, researchers have reported prevalence rates ranging from 2% to 12% across the country in recent years (Gezawa et al., 2015; Uloko et al., 2018).

It is estimated that about 90% of all diabetes cases are type 2 diabetes and more than 380 million individuals worldwide are diagnosed with type 2 diabetes (IDF, 2017; 2021; 2022). Generally, type 2 diabetes mellitus is characterized by insulin resistance, whereby an individual's body does not fully respond to insulin. Because insulin cannot work correctly, the person's blood glucose levels keep rising, releasing more insulin. For some individuals with type 2 diabetes, this situation exhausts the pancreas, resulting in the body producing less insulin, causing even higher blood sugar levels (hyperglycemia). Though Type 2 diabetes is commonly seen in older adults, it is now increasingly seen in children, adolescents, and younger adults due to rising levels of obesity, physical inactivity, and poor diet (IDF, 2021; 2022).

Diabetes Self-Care Behaviours

Diabetes self-care behaviours are activities undertaken by people with or at risk of diabetes to manage the disease on their own. It is an evolutionary process of developing knowledge or awareness by learning to survive the complex nature of diabetes in a social context (Shrivastava et al., 2013). Seven essential self-care behaviours in people with diabetes predict good health outcomes. They include healthy eating, being physically active, monitoring blood sugar, compliance with medications, good problem-solving skills, healthy coping skills, and risk-reduction behaviours (Shrivastava et al., 2013; Amer et al., 2018; Kolb, 2021).

Diabetes self-care behaviours help to enhance their quality of life and prevent complications involving the heart, blood vessels, eyes, kidneys, and nervous system (Rajasekharan et al., 2015). According to the American Diabetes Association (ADA) and European Association for the Study of Diabetes (EASD), providing patient-centred care with a multi-disciplinary team



is essential to effective diabetes management (Davies et al., 2018). Self-management of the blood glucose level of diabetic patients at an optimum level is a cornerstone of diabetes care that can ensure patient participation in achieving and maintaining specific glycemic targets. The most critical objective of monitoring is assessing overall glycemic control and initiating appropriate steps promptly to achieve optimum control. Self-monitoring provides information about current glycemic status, allowing for the assessment of therapy and guiding adjustments in diet, exercise and medication to achieve optimal glycemic control. Diabetes self-care behaviours have been linked to patient glycaemic control (Okoye & Ohenhen, 2021).

Physical activity is critical for blood glucose management and quality of life in people diagnosed with diabetes mellitus. Physical activity/exercise are often used interchangeably to mean the same thing, but they do not. Physical activity includes all bodily movements that increase energy usage, whereas exercise is a form of physical activity that is planned and structured to yield its desired effect. Because of its uniqueness, exercise may be more appropriate for diabetes. However, the need for any form of exercise should depend on individual characteristics and health status.

Regular physical activity is associated with improved health outcomes among people with diabetes (Colberg et al., 2016). Studies have shown that routine exercise improves glycemic control in type 2 diabetes, reduces the risk of cardiovascular conditions, contributes to weight reduction, and improves health-related quality of life (Chen et al., 2015; Lin et al., 2015). Structured lifestyle behaviours that include engaging in at least 150 minutes per week of exercise and dietary modifications resulting in weight loss of 5%–7% are recommended to prevent or delay the development of type 2 diabetes in high-risk populations and with prediabetes. (Colberg et al., 2016). Also, regular exercise can prevent or delay type 2 diabetes development (Schellenberg et al., 2013).

A position Statement by the American Diabetes Association buttresses that adults with type 2 diabetes can have optimal glycemic and health outcomes when they perform aerobic and resistance exercise training. Everyday exercise, or at least not allowing more than two days to elapse between exercise sessions, is recommended to enhance insulin action. Routine exercise also is of immense benefit to people with type 1 diabetes, as it improves cardiovascular fitness, muscle strength, insulin sensitivity, etc. (Yardley et al., 2014). The challenges related to blood glucose management vary with diabetes type, activity type, and diabetes-related complications (ADA, 2016). Therefore, physical activity and exercise recommendations should be explicitly tailored to fulfill the requirements of each individual.

Determinants of Diabetes Self-Care Behaviours

A growing literature suggests that patients with diabetes do not perform required care activities, and several reasons have been attributed. Though self-care behaviours are determining factors in controlling the disease and its related complications, self-care is highly challenging since factors such as diabetic patients' knowledge (AlQahtani et al., 2020), physical skills (Reyes et al., 2017), emotional factors (Reyes et al., 2017), self-efficacy (Reyes et al., 2017; van Smoorenburg et al., 2019), costly of diabetes treatment (Suglo & Evans, 2020), family support (Suglo & Evans, 2020) and other perceptions of the patient interact and affect the self-care behaviour (Reyes et al., 2017). Other factors that may affect self-care behaviours include demographic, socioeconomic, psychological, health status, and the healthcare system (Schulman-Green et al., 2016; Gonzalez-Zacarias et al., 2016).



Research has identified individual socioeconomic status as influencing diabetes self-care behaviours. Socioeconomic status is often associated with access to health care, healthcare utilization, use of medication, and access to good nutrition (Okoye & Ohenhen, 2021). In Nigeria, only a tiny proportion of its citizens are registered with health insurance schemes (Okpani & Abimbola, 2015). Therefore, most people pay out of pocket for healthcare-related expenses. In other words, affordability, adherence to medications, and engaging in other self-care behaviours depend on their socioeconomic status.

Furthermore, the male sex, higher income, and a higher level of education were associated with better self-behaviours and glycaemic control (Okoye & Ohenhen, 2021). Most studies have reported significantly higher HbA1c levels in women, and significantly fewer women than men achieve target HbA1c levels of <7 and <8% (Kautzky-Willer et al., 2010; Duarte et al., 2019). This observed difference between the females and males concerning glycaemic control has been attributed to differences in the regulation of glucose homeostasis (e.g., hormones and visceral adipose distribution) (Duarte et al., 2019; Mauvais-Jarvis, 2018). Other possible reasons for the different outcomes between men and women concerning glycaemic control are treatment response (e.g., side effects) and psychological factors (e.g., acceptance of disease) (Arnetz et al., 2014). Women had several social and economic disadvantages (i.e., lower education, lower participation in paid work, and reduced wages or economic dependence) that might decrease their ability to achieve glycaemic control successfully. In contrast, other studies have shown that male patients were 5.551 times more likely to have deficient self-care practices as compared to female patients (Jackson et al., 2014; Rahaman et al., 2017; Dedefo et al., 2019).

The significance of patients becoming involved and knowledgeable participants in their care must be considered. It may be presumed that those with a higher level of education are better aware of the complications of diabetes and, thus, are more motivated to adhere to medications and lifestyle modifications. The American Diabetes Association reviewed the standards of diabetes self-management education and discovered a four-fold proliferation in diabetic complications for those with diabetes who had not obtained formal education regarding self-care practices (Mensing et al., 2006). According to a review of diabetes self-management education, the result revealed that education is successful in reducing glycosylated hemoglobin levels (Norris et al., 2002). Similar findings concerning the level of education and glycaemic control have been reported by researchers in Nigeria (Okoye & Ohenhen, 2021). In contrast, other studies reported that patients with low educational levels had better compliance (Al-Rasheedi, 2014). Diabetes care is complicated and demands that multiple problems beyond glycemic control be managed.

Role of Nurses in Promoting Self-Care Behaviours

Nurses are vital in supporting individuals living with type 2 diabetes mellitus. Aside from helping administer medication, nurses continuously offer significant health and psychological recommendations to help patients solve the daily challenges type 2 diabetes mellitus can bring. Moreover, nurses often build community support networks that many with type 2 diabetes mellitus rely on for advice and reassurance. Also, nurses must seize every opportunity to provide valuable dietary and lifestyle modification advice to help individuals with type 2 diabetes reduce their risk of developing complications.

Education is the cornerstone of healthcare. Educating patients/clients with type 2 diabetes mellitus on self-care management has become the gold standard of care. Individuals diagnosed



with type 2 diabetes mellitus require comprehensive day-to-day knowledge of nutrition, exercise, monitoring, and medication to accomplish daily self-care goals (Shrivastava et al., 2013). Research has depicted a correlation between those well-equipped with self-care knowledge and resultant confidence in taking control of their condition by modifying and adopting healthy lifestyles and monitoring blood glucose levels, consequently improving the health-related quality of life (Polikandrioti, 2010). Poor or inadequate knowledge of diabetes self-care behaviours will result in diabetes distress/burnout and poor glycaemic control, leading to diabetes complications such as blindness, renal failure, and amputation (Shrivastava et al., 2013). Therefore, healthcare providers, especially Diabetes nurse educators (DNE), must endeavour to equip patients with the appropriate and comprehensive knowledge and confidence to achieve self-care goals for metabolic control as declared in the National Standards for Diabetes Self-Management Education and Support (Funnell et al., 2011).

Nurses must endeavour to use several teaching strategies in educating the patients/clients on the seven principles of effective self-care management, which include a healthy diet, exercise, adherence to medication, glucose level monitoring, problem-solving, reducing risks, and healthy coping (Powers et al., 2015). The teach-back technique and pictures are recommended for patients with low literacy (Ramaswamy et al., 2016). In contrast, one-to-one consultation was reported to be more effective than group-based consultation (American Diabetes Association Standards of Medical Care in Diabetes-2013, 2015).

Healthcare professionals, especially nurses, can help people with type 2 diabetes mellitus adopt positive self-care behaviours and lower diabetes-related distress by arming themselves with up-to-date, reliable information and notifying their patients on managing their condition with evidence-based care and know-how.

Instrument for Measuring Diabetes Self-Care Behaviours

Because patients and their families handle the vast majority of the day-to-day care inherent in diabetes, there is a critical need for reliable and valid measures of diabetes self-management. The assessment of self-care performance is vital for monitoring and determining self-care support by the nurse. Several tools for diabetes self-care assessment have been developed with good psychometric properties, but most are in English.

Summary of Diabetes Self-Care Activities (SDSCA)

Toobert and Glasgow developed the Summary of Diabetes Self-Care Activities (SDSCA). It is the most widely used instrument to assess diabetes self-care activities (Toobert & Glasgow, 1994). SDSCA is a simple, valid, reliable questionnaire (Adarmouch et al., 2016). The revised version contains 25 items on diet, drug, foot care, physical activity/exercise, self-monitoring of blood glucose, smoking, and self-care recommendations from healthcare providers (Toobert et al., 2000). The SDSCA has been translated into several languages, including Chinese, Spanish, Turkish, Korean, Malay, German, Arabic, and Moroccan, and thus confirmed as a valid and reliable scale for assessing diabetes self-care behaviours for patients with Diabetes Mellitus across cultural backgrounds (Adarmouch et al., 2016; Sugiharto et al., 2019).



Diabetes Self-Management Questionnaire (DSMQ)

The DSMQ is a measurement tool developed in Germany at the Research Institute of the Diabetes Academy Mergentheim in 2013. It is targeted at elucidating vital information on diabetes self-care and was designed to evaluate behaviours associated with metabolic control within typical treatment regimens for type 1 and type 2 diabetes in adult patients and to overcome the limitations of contemporary questionnaires (Schmitt et al., 2013). The questionnaire is available in two forms from the original authors. The 16-item DSMQ has 4 subscales: Glucose Management (GM) with 5 items, Dietary Control (DC) with 4 items, Physical Activity (PA) with 3 items, and Healthcare Use (HU) with 3 items, and one general statement. The DSMQ has been translated into several languages. The DSMQ has been used in many studies, supporting its potential value for research and practice. Studies have shown that the DSMQ, in direct comparisons, tends to explain significantly more glycemic variation than an established standard self-care scale (Schmitt et al., 2013; Schmitt et al., 2016). A recent systematic review identified the DSMQ as one of only three scales on diabetes self-management that met the COSMIN (Consensus-based Standards for the selection of health Measurement Instruments) guidelines for measurement tools that are valid (Wee et al., 2021).

The DSMQ has been revised because technological innovations such as continuous glucose monitoring and automatic insulin delivery have changed terms and expressions in diabetes care, which has also influenced a shift in diabetes-related language. Also, the tool needs to cover some specific self-management aspects of diabetes better. The new DSMQ-R thus contains 27 items, 20 on general behaviours relevant for most people with diabetes and seven on specific insulin treatment behaviours. A total score is estimated using the 20 general items; where applicable, a 27-item total score can be calculated, including the optional items. The subscale 'eating behavior' contains now six items, and the subscale 'cooperation with diabetes team' four; 'medication-taking,' 'glucose monitoring,' and 'physical activity remain unchanged with two, three, and three items, respectively. Two of the 20 general items request global statements and are only included in the total scale (Schmitt et al., 2022).

CONCLUSION

Diabetes Self-care behaviours could be life-changing when harnessed optimally. Diabetes-related morbidity and mortality among patients with type 2 diabetes mellitus can be prevented via self-care behaviours in multiple domains such as diet, physical activity/exercise, monitoring blood sugar, compliance with drugs, good problem-solving skills, healthy coping skills, and risk-reduction behaviours (such as smoking cessation, weight reduction). Lowering the patient's glycosylated hemoglobin level may be the top priority of diabetes self-management, but it cannot be the only objective in a patient's care. A nurse must critically assess the various changes in self-care activities for progress toward behavioral change. Several determinants, such as socioeconomic status, level of education, and gender, have been shown to influence diabetes self-care behaviours; however, the role of nurses in promoting self-care behaviours is vital to avert any long-term complications. Therefore, harnessing the power of diabetes self-care behaviours to improve a patient's health is a life-changing magic in type 2 diabetes care.



RECOMMENDATIONS

1. Nurses should always teach the patients how to manage and stay healthy with diabetes at every contact, and this is because some patients may experience difficulty in comprehending and complying with the basics of diabetes self-care activities.
2. Nurses should always use validated and reliable tools to assess patient self-care performance, as this is vital for monitoring and determining the level of self-care support needed.
3. From the onset, nurses must actively involve their patients/clients in developing structured and realistic self-care behaviours for each patient/client to avert diabetes-related emotional distress or burnout.
4. Nurses should tailor patient self-care support based on the personal responsibility the patient is willing to assume toward their diabetes self-care management.
5. Nurses should fully document the specific diabetes self-care behaviours in the patient's medical record, as it will enhance provider-patient communication and help assess compliance.

DECLARATIONS

Competing Interests

The author declare there is no conflict of interest, This work did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

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