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## **Educating Nurses to Help Promote Diabetes Self-Care Management in Primary Care**

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*Walden University*

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# Walden University

College of Nursing

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Delphine Ikpasaja

has been found to be complete and satisfactory in all respects,  
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the review committee have been made.

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Walden University  
2021

Abstract

Educating Nurses to Help Promote Diabetes Self-Care Management in Primary Care

by

Delphine E Ikpasaja

MS, Walden University, 2019

BS, Jacksonville University, 2013

Project Submitted in Partial Fulfillment  
of the Requirements for the Degree of  
Doctor of Nursing Practice

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May 2021

## Abstract

Diabetes is a chronic disease that has a genetic and lifestyle component, and it affects individuals in various parts of the world. A lack of understanding of the nature of the disease has contributed to the complications experienced by patients with diabetes 2 (DM2), such as an elevated glycosylated hemoglobin (A1C) and hyperglycemia. At the clinic where this project took place, patients received an initial teaching but did not get any further support or resources to manage their disease. A four sections of a 30 minutes each was the educational presentation used with staff at the clinic to help them with the right strategies to teach patients about their disease and how to self-manage. The research question tries to find out if an educational program provided to these primary care staff would ultimately help DM 2 patients. The chronic care model by Wagner and the adult learning theory by Knowles were used to guide this project. Eleven staff members participated in the pre and post-test well as the training. The results of the pre and post-test were compared using the Wilcoxon Signed Ranks Test and were significant ( $Z = -3.020, p = .003$ ), representing a positive improvement after the education was given to the staff. The primary care clinic will follow up with a quality assurance in 6 months to check and monitor the A1C level to see if the teaching was effective. An understanding of the teaching strategies to support patients towards self-care management can improve compliance and reduce the complications of the disease. Developing self-care management is the type of positive social change this project aimed to bring into the care of individuals with DM2 who needed basic instructions, support, and resources essential to help them prevent the damaging effects of chronic hyperglycemia.

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## Dedication

I dedicate this DNP project to the Almighty God, the father of the fatherless, my late parents, Mr., and Mrs. Dory Ikpasaja, and my family all over the world, especially my children, for their support, favor, love, and blessings throughout my academic life.

## Acknowledgments

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## Section 1: Nature of the Project

### **Introduction**

Managing diabetic patients can be challenging. Patients are often introduced to an educational process when they are first diagnosed, but this brief introduction was not usually sufficient. Powers et al. (2016) shared that effective coping and self-management was required for day-to-day living with Type 2 diabetes (DM2) and necessitates a personalized and comprehensive approach with effective delivery involving experts in educational, clinical, psychosocial, and behavioral DM2 care. Sometimes, this lack of continuing education can result in hyperglycemia, which can become chronic. A systematic review by Nazar et al. (2015) indicated that an impaired awareness of DM2 increases the likelihood of developing the complications of the disease. The Centers for Disease Control and Prevention (CDC, 2018) explained that diabetes self-management education (DSME) and other support services help people with DM2 learn how to take the best care of themselves. In primary care, providers typically take this educational process as their responsibility but sometimes without formal tools or education on DM2 self-management that they could use to support the patient with the challenges of the disease. Patients with DM2 at the clinic in this research project needed the educational tools and resources to be able to manage their disease and prevent hyperglycemia, one of the complications of the disease.

Technology in the form of smart mobile devices has provided new tools that could be beneficial for the ongoing self-care management of the diabetic patient. Technology, according to Alcántara-Aragón (2019), offers the diabetic patient the

opportunity to improve self-care through empowerment. DM2 education is key to approaching an optimal use of DM2 technologies (Alcántara-Aragón, 2019). Even though many patients have smart phones continued Alcantara-Aragon, not all diabetic patients see their use as an option. The writer concluded that researchers have found that several doses of insulin and blood glucose meter users had more adverse views regarding DM2 technologies than pump and uninterrupted glucose monitoring users (Alcántara-Aragón, 2019). Ultimately, the staff at the primary care site in this research project implemented the use of technology as one of the resources to support these patients. Enhancing self-care management is the type of positive social change the educational tools provided in this project can bring to the care of people with DM2 who need basic instructions, support, and resources necessary to help them prevent the devastating effects of chronic hyperglycemia.

### **Problem Statement**

The staff at the practice in this study provided initial education; however, attention to self-care education on DM2 was not overseen at every visit. By enhancing the knowledge base of the nursing staff and providing them with skills and tools to implement with follow up, not just at the time of diagnosis, patients have a better chance of controlling their glycemic index and reducing their glycosylated hemoglobin (A1C). According to the CDC (2018), the goals for most people with DM2 is an A1C level of 7% or less; however, personal goals depend on many factors, such as age and other medical conditions. García-Pérez et al. (2013) shared that communication between patients and healthcare providers resolved patient distress, and patients were more

informed about treatment options and decisions, which improved adherence and glycemic control.

According to the report from Diabetes Research Institute Foundation (DRIF) (2018) 34.2 million people, or 10.5% of the U.S. population, have diabetes. An estimated 26.8 million people - or 10.2% of the population - had diagnosed diabetes. Approximately 7.3 million people have diabetes but have not yet been diagnosed (2018). The American DM2 Association (ADA, n. d.) explained that diabetic individuals in Maryland, where the project site is located, amounted to about 623,000, or 12.6% of the population. Of these, 156,000 had DM2 and were not yet aware or diagnosed. Furthermore, ADA shared that 1,634,000 people in Maryland or 36.9% of the population are prediabetic also explained that among U.S. adults aged 20 years or older with diagnosed DM2, the estimated prevalence of kidney disease was 36.5% in 2011-2012. In 2014, a total of 52,159 people developed end-stage renal disease with DM2 as the primary cause (ADA, 2019). Patients with DM2 often develop peripheral vascular disease that results in short- and long-term consequences of the disease. According to Thiruvoipati et al. (2015) diabetes mellitus (DM) is a major risk factor for atherosclerotic disease as well as cardiovascular mortality and morbidity. Atherosclerotic disease, the writers shared, is not only increased in incidence in diabetic patients, but its course is also accelerated, thereby accounting for as much as 44% of all-cause mortality. DM related atherosclerosis can lead to problems in all major of vascular beds, including the coronary arteries, carotid vessels, and lower extremity arteries (Thiruvoipati et al. 2015) Thus, the

incidence and sequelae of DM2 indicates that managing this condition early on and through primary care is critical in preventing devastating long-term complications.

Diabetic patients may not understand the relationship between their blood sugar, daily activities, and hyperglycemia. In the primary care setting of this research project, diabetic patients come in when they need to refill their prescriptions without communicating about their disease. The provider does not check blood sugar except when the patient complains of signs and symptoms of hyperglycemia. Thus, in this doctoral project I ultimately sought to promote self-care management in these patients to bring understanding about DM2 as well as the necessary basic instructions, support, and resources they need to help them prevent hyperglycemia and improve their A1C.

The role of nursing in managing chronic diseases like DM2 cannot be over emphasized. This primary care setting in this doctoral project was made up of a medical assistant, two licensed practical nurses, seven registered nurses, and two nurse practitioners, all of whom were familiar with DM2 patients and the challenges that existed in disease management. However, the right tools are needed to manage DM2. The staff need continuous contact with these patients, understand their peculiar needs, and recommend resources such as the use of technology and smart phones to manage the disease.

### **Purpose Statement**

The meaningful gap in practice was the lack of follow-up and provision of tools and resources needed for these DM2 patients. Diabetic patients need more than an initial patient education session to better control and prevent chronic hyperglycemia. The

practice-focused question for this DNP project wants to find out to what extent an educational program provided to primary care staff will help DM2 patients prevent chronic hyperglycemia. This DNP project could potentially address this problem by providing the primary care workers at the study site with resources that they could use with DM2 patients to maximize glycemic control early in the trajectory of DM2 and to minimize or decrease the complications of the disease. This project supported staff at this primary care office with tools they need to implement and encourage diabetic patients to be involved in the management of their disease, and, therefore, decrease hyperglycemia complications. This change could possibly help diabetics maintain self-control of their disease, reduce their glycosylated hemoglobin to normal levels, and reduce the complications that could ensue.

### **Nature of the Doctoral Project**

In searching for evidence, I used keywords like *diabetes mellitus Type 2 in teaching/education, compliance, nonadherence, tools for effective teaching, teach-back method, cultural competence, empowerment, and self-care management* using databases such as Medline with full text, CINAHL with full text, ProQuest nursing, and allied health source, Pubmed.gov using the Walden library and Google Scholar for evidenced-based practice information. My search also included recommendations from the (CDC), (WHO), (ADA), United States National Library of Medicine, National Institute of Health, and American Association of Diabetes Educators (AADE). Using the Boolean approach, I narrowed my search to 5 years to date and applied the word, *or, and, not, and*, in some cases, I used an additional “*and*” to narrow or expand my search.

At the DNP project site, there were approximately 265 patients who used this primary care clinic; of these, 70% were diabetics (25% Type 1 and 45% Type 2). An educational program was provided to the staff and was offered as a 4-hour workshop, spread over 4 weeks, in 1-hour sessions. The curriculum included the use of tools from the Powers et al., 2017 and the CDC DSMES toolkit. Training focused on the use of smart phones for journaling and tracking, proper blood sugar testing, diet and nutrition, exercise, as well as providing a problem-solving discussion on barriers that staff and patients face in managing this condition to control chronic hyperglycemia. Each session included a coaching opportunity, where staff were encouraged to bring de-identified case studies for discussion. These case studies were rich opportunities to discuss real patients, the issues patients face in managing their condition, and anticipated tools, approaches, or solutions that could be brought to the dialogue. A pre and post-test (Appendix B) were used to gauge improvement in knowledge acquisition, and the training was role-specific customized for the LPNs, RNs, and NPs at this practice.

The DNP project was an educational program designed to train the healthcare workers at this primary care office on how to teach patients about DM2 to reduce the incidences of chronic hyperglycemia. The owner of the practice decided that the educational project should focus on the nursing, and, therefore, exclude the medical assistant at the time of the study. For this reason, I worked with 11 staff members (seven RNs, two LPNs, and two NPs) at the primary care site to provide a role-specific educational process with coaching. The curriculum included role play and incorporated the use of technology for diet journaling, blood sugar logging, and activities. A follow-up

coaching session (Appendix C) with primary care staff included a few case studies (Appendix D) and a presentation of staff encounters when teaching DM2 patients. The Walden University staff education manual was used to guide the DNP project.

Thus, the purpose of this DNP project was to help close the gap in practice by providing the staff members at the study site with adequate tools to enhance DM2 patient self-management. In this case, the healthcare worker's inability to effectively teach the diabetic patient and the lack of patients' understanding of their disease hampered patient care management, as evidenced by the percentage of patients with elevated A1C levels. With the knowledge of the resources needed by the diabetic patient, the healthcare staff actions were essential in the reduction of hyperglycemia in these patients.

### **Significance**

DM2 is a serious and life-threatening disease; however, it can be managed through proper treatment and control mechanisms. It is more of a challenge when the patient does not understand the disease and the healthcare staff are not aware how to effectively coach the patients. In this DNP project, I sought to close that gap in practice by providing the resources the healthcare staff needed to promote self-care in their DM2 patients. Chester et al. (2018) stated that while there are lot of training materials for health care providers to use, not many medical staff provide the information in a down-to-earth approach that is understood by the patient.

The diabetic patients at this primary-care center had not been receiving teaching as they should to help manage their disease. Without education, they ran the risk of developing hyperglycemia that could become chronic. With the understanding of their



disease, the diabetic patient is prepared to self-manage and can better prevent complications such as hyperglycemia. Additionally, Chester et al. stated that DM2 is an everlasting condition that requires a few day-by-day self-administration choices and complex consideration exercises. The educational tools I shared in this project provided the healthcare staff at this practice the necessary teaching strategies to support these patients. The patients in turn become involved in their own care and the management of their disease. This method is transferable as it could be used in any primary/outpatient practice.

### **Summary**

Patients with DM2 needed educational tools and resources to be able to manage their disease and prevent hyperglycemia, one of the complications of the disease. Education and teaching play a significant role in how the patient is to manage the disease. According to Chester et al. (2018), the nurse needs to teach the patient how to use the home-based glucose monitor and explain how to recognize the normal from the abnormal blood glucose levels before and after meals, as well as be instructed on the recommended A1C levels. In this project, I sought to promote social change by educating the staff of this primary care office about how to teach patients to prevent hyperglycemia and related complications. The knowledge and skills acquired by the nurses can serve as an instrument of change for patients. When patients with this disease understand how to manage their disease, there can be a reduction of hyperglycemia complications. This, in turn, can reduce the statistics of mortality as well as reduce the economic cost associated with managing the disease.

## Section: Background and Context

### **Introduction**

DM2 is a chronic disease that results in short- and long-term effects on the patient, affecting disease progression and quality of life. According to the ADA (2019), chronic hyperglycemia in DM2 may result in multiple organ damage and loss of function and affects the individual's quality of life. With the reduction of chronic hyperglycemia, a patient may be able to reduce the complications of multiple organ damage. For this reason, the nurses in this primary care setting needed education that could effectively and efficiently benefit their DM2 patient in a way that promoted the patients' self-management. The ADA (2019) shared that nurses must understand everything about DM2 to adequately teach these patients.

In the primary care setting for this project, the DM2 patients needed further teaching and a regular follow up about their disease and the management thereof. A lack of understanding about how to manage the disease could lead to chronic hyperglycemia. In the DNP project, the nurses were educated on how to properly teach these patients about their disease. The practice-focused question for this DNP project wants to find out to what extent an educational program provided to primary care staff will help DM2 patients prevent chronic hyperglycemia.

### **Concepts, Models, and Theories**

Nursing as science is, to a great extent, founded on evidence-based practices and interventions for a better or enhanced performance. This implies that nurses must rely on various nursing theories and models for better performance in nursing practice. The nursing theories and models provide nurses with a framework that supports understanding what is needed for essential performance as well as acting in response to various nursing care situations (Wayne, 2020). Additionally, these theories offer the basis of nursing practice, help to create additional information through research while proposing what needs to be done and be developed in the future. Therefore, this Type 2 diabetic self-care management guide refers to some theories relevant to the provision of disease management in patient education.

### **Diabetes Self-Care Management**

Rochfort et al. (2018), in a systematic review, wanted to understand if the relationship between education given by a healthcare professional improved patient self-management in DM2 patients. Furthermore, the writers shared that due to the extremely low positive result, there is no significant evidence that shows that teaching will improve self-management (Rochfort et al., 2018). There are several nursing interventions that could help DM2 patients, but their success was to a great extent based on self-care management by patients. Regarding this, it is important to note that DM2 patients have some learning needs that enable them to manage the disease and prevent further complications. Researchers have continued to undertake studies on various aspects of DSME. Some of these research works have tried to address the comprehensive learning

needs that patients with Type 2 diabetes have about self-care management. However, most research studies have affirmed that nursing interventions in self-care management have a significant impact on patients with DM2.

In 2018, a quantitative research study involving 140 DM2 adult patients assessed the impact of DSME using two groups (Azami et al., 2018). The first group was the control group who as provided with the usual care, and the intervention group had nurse led DM2 DSME. Participants included in the research study were required to be DM2 adult patients above 18 years, were on medication for not less than 6 months, and whose A1C was greater or equal to 8%. Azami et al. (2018) established that the nurse led DSME program improved lifestyle and psychological and clinical results. The intervention group showed a remarkable improvement in efficacy expectation, body weight, self-management behavior, social support, result expectation, and glycemic control. From the study, it was apparent that nurse led DSME intervention was more effective and beneficial to patients than routine care. This implies that nurse could help address the learning complexities that patients face regarding DSME.

### **The Impact of DSME on the Patients' Quality of Life**

The current lack of a cure for diabetes is a challenge for many patients seeking healthcare services because nursing interventions are aimed at enhancing the patients' quality of life. Such interventions require a lifelong commitment. It could take time for a DM2 patient to develop a routine, but with dedication and effort, it can become viable (Powers et al., 2016). Diabetes self-management support (DSMS) refers to the support that is required for implementing and sustaining coping skills and behaviors needed to

self-manage on an ongoing basis stated Powers et al. Although different members of the health care team and community have contributed to this process, it is important for health care providers and their practice settings to have the resources and a systematic referral process to ensure that patients DM2 receive both DSME and DSMS in a consistent manner. According to Mardanian & Abdoli (2017) DSME is a significant factor impacting the quality of life amongst patients with DM2. Therefore, the writers shared, it was crucial to evaluate the effectiveness of DSME programs based on the experience of those taking part in the programs. Furthermore, that the participants in this qualitative research were DM2 patients from Iran and who had either attended a DSME program for DM2 or were willing to participate in the study at targeted endocrinology centers. Mardanian & Abdoli, revealed that participants enrolled in the DSME program from September 2011 to June 2012, after which 15 participants were chosen through purposive sampling to participate in the research. Diabetes self-management education and support (DSMES) provides an evidence-based foundation to empower people with diabetes to navigate self-management decisions and activities (CDC, 2018). DSMES is a cost-effective tool proven to help improve health behaviors and health outcomes for people with diabetes.

In inference, Mardanian & Abdoli affirmed that the current techniques for DSME did not meet the needs and expectations of patients with dementia participating in the program. Therefore, there was a need for improvement of DSME in terms of interactive teaching techniques, needs evaluation, multidisciplinary models, physical space needs, and technology. Other diseases produce more impact when a patient has DM2 as an

underlying condition. Adequate disease management could be achieved through a collaboration between nurses and the patient through collaborative DSME. Therefore, there was a significant impact of a nurse led DSME on the patients' quality of life (Mardanian & Abdoli, 2017).

### **Tools for Primary Care Nurses**

Nurses in their practice use various tools in the provision of primary care based on the needs of a patient. Similarly, nurses use some tools when educating DM2 patients on self-care management as an intervention to enhance their quality of life. Nurses also use the tools to ensure that patients are informed on their health and disease prevention as well as management. Pamungkas et al. (2017) concluded that it is necessary to use a collaborative approach, which entails the involvement of nurses, the patient, and family. Establishing this synergy in a nurse led DM2 DSME program ensures that the patient receives total support whenever they start portraying a negative attitude or behavior towards glycemic control. In this study, the outcome depended on patients' A1C levels in the previous 3 months, self-reported self-care behaviors, family social support, and physiological consequences (Pamungkas et al., 2017). As per the findings, DSME techniques that involved family were identified as essential in enhancing DM2 self-care management (Pamungkas et al., 2017)

Nurses providing primary care for patients with Type 2 diabetes can also make use of technology in establishing a routine, which is key to the management of the disease. One such technology is a smartphone. This technology tool could be effective in setting goals and reminders for patients under the DSME program. For instance, the

MyNetDiary (n. d.) application could be installed on a smartphone to provide an easy and comprehensive method for blood glucose (BG) tracking. Multiple readings could be entered per day, specifying the time and optional notes. The app provides built-in BG reminders. The patient could set multiple reminders for a day, which would play a sound and popup as a notification, reminding about measurement and allowing for a quick jump to the BG entry mode. MyNetDiary and Diabetes and Diet Tracker are available for Android and have the same core set of features as the iPhone app.

### **Social Determinants and DSME**

The social determinants of health (SDH) take into consideration the social, economic, education, location, health inequalities, resources, and other factors of the individual. According to Cockerham et al., (2017), perceived discrimination has been found to be a prominent SDH for members of racial, ethnic, gender, or other minority groups. Furthermore, the researchers claimed that it was already clear from research on SDH that the debate over whether social factors are fundamental causes of health and disease is essentially over. Most research studies have shown that society could either make a person sick or promote their health; the next step is to refine the causes and consequences of this phenomenon (Cockerham et al., 2017). SDH is directly related to DSME; therefore, individual patients are affected depending on their experience, circumstances, and unique social issues.

### **Chronic Care Model (Wagner)**

Da Valle et al. (2018) stated that this is a way to restructure and organize primary care to better manage patients with chronic diseases. Furthermore, this was a

care design focusing on six modifiable components of health care delivery: organizational/system support, clinical information systems, delivery system design, decision support, self-management support, and community resources. Additionally, that the first four components in the model address practice strategies, and the final two are specifically patient centered. The chronic care model (CCM) was developed to provide chronic disease patients, including those with DM2, with forms of self-care and tracking systems. The CCM embodies a process for streamlining health care through collaborations between health systems and communities (De Valle et al., 2018). The models gather essential information that could be used for enhancing treatment in health systems at the community, clinical practice, and patient levels. DM2 has no cure and can quickly become chronic when not properly managed.

In a systematic review, Baptista et al. (2016) intended to discover the relationship between CCM and DM2 patients. Of the 12 studies reviewed, six showed evidence that CCM had positive effect on DM2 patients. The other six were not as successful due to various factors. Baptista et al., therefore, concluded that for CCM to be effective for most DM2 patients, all the six elements must be applied instead of an isolated use of one element.

### **Adult Learning Theory**

Conaway et al. (2015) shared that the foundation of Knowles's approach to adult learning in 1984, which he called andragogy, was built upon two main points: a recognition of the knowledge and understanding gained by adult learners and the idea that the learner is central to the process rather than the instructor. Additionally, that as



Knowles pursued his research, more points or principles of andragogy were found to be instrumental in his approach to adult learning. Furthermore, the writers shared the following six principles upon which Knowles generated his formal andragogical concept. According to the writers, these were the role of experience, self-directedness, the learner's need to know, readiness to learn, orientation to learning, and intrinsic motivation.

Portugal (2017) shared that Knowles' theory of andragogy showed various theory targeted specifically to adult learners. Knowles' theory emphasizes that adults were self-directed and expected to take responsibility for decisions. Within Knowles' theory, said Portugal, there were key tenets: (a) adults need to know why they need to learn something, (b) adults need to learn experientially, (c) adults approach learning as problem-solving, and (d) adults learn best when the topic is of immediate value. Thus, the implications of Knowles theory for the DM2 patient are clear: learning to manage their disease and prevent the long-term complications of DM2 could be a very powerful reason and patients can appreciate immediate benefit. When providing patient education to DM2 patient, it was important to consider that the outcome was greatly influenced by the complexity of information and their motivation to learn the writer noted. However, Portugal warned that the application of Knowles' adult learning style must be specific and individual putting into consideration all factors faced by that patient.

### **Definition of Terms**

*Diabetes mellitus:* A disorder depicted by hyperglycemia that is caused by the body's lack of ability to use blood sugar for vitality. In Type 1 diabetes, the pancreas does

not make insulin, and, for this reason, blood sugar cannot be transported to the cells or converted to energy. Conversely, in DM2, the insulin produced by the pancreas is minimal or the body for some reason cannot use the available insulin properly (Diabetes.org. 2020)

*Diabetes self-management education (DSME):* People with DM2 use various support programs to help them learn how to take the best care of themselves (CDC, 2019).

*Diabetes self-management support (DSMS):* Refers to the help required to implement and use the coping skills and behaviors necessary to for the patient to handle themselves on an ongoing basis (Powers et al., 2016).

*Hemoglobin A1C:* A test that measures the average blood sugar level of a person over the past 2 to 3 months. The part of a red blood cell that brings oxygen to the cells and enters the bloodstream with glucose is hemoglobin. The test indicates the amount of glucose that binds to the red blood cell, which is proportional to the amount of glucose in the blood cell, also called hemoglobin A1C or glycosylated hemoglobin (Diabetes.org. 2020).

*Hyperglycemia:* A BG level that is excessive and outside of normal limits. After a person has fasted for at least 8 hours, fasting hyperglycemia is blood sugar above a desirable amount. Postprandial hyperglycemia is above the desirable level of blood sugar 1 to 2 hours after a person eats (Diabetes.org. 2020).

*Insulin:* A hormone that allows the body to use glucose for energy. Insulin is formed by the beta cells of the pancreas. It is administered by subcutaneous injection or

using an insulin pump when the body does not produce enough insulin (Diabetes.org. 2020).

*Neuropathy:* Both a symptom and a disease of the nervous system. In people with diabetes, peripheral neuropathy, autonomic neuropathy, and mononeuropathy are the three main types. Peripheral neuropathy, which primarily affects the legs and feet, is the most common type (Diabetes.org. 2020).

*Self-management in diabetes:* The ongoing diabetes management process that involves meal preparation, scheduled physical exercise, tracking of blood sugar, taking medications for diabetes, treating periods of disease and low and high BG, controlling diabetes while traveling, and more. In conjunction with several health care providers, such as physicians, nurses, dietitians, pharmacists, and others, the person with diabetes designs their own self-management treatment plan (Diabetes.org. 2020).

*Type 2 Diabetes Mellitus:* A disorder characterized by elevated levels of blood sugar caused by either a lack of insulin or the failure of the body to use insulin effectively. In middle-aged and older adults, Type 2 diabetes occurs more frequently, but the condition can also occur in young people (Diabetes.org. 2020).

### **Relevance to Nursing Practice**

This DNP project is relevant to nursing practice. This was an educational project that provided instruction to nursing staff about how they should teach patients about their disease and self-care management. This could reduce the prevalence of hyperglycemia and the damage to various organs in DM2 adults. Without an adequate understanding of the disease, patients developed complications such as hyperglycemia, lowering their life

expectancy and negatively affecting the economy. In the primary care center, that was the setting for the DNP project, the staff confirmed that after the initial teaching at the disease onset, no other teaching was offered on a regular follow up basis (Okoro, A. personal communication, October 2, 2020). This project focused on educating the nursing staff about how to teach patients to understand their disease and be part of their care. Nursing is responsible for teaching their patients, following up with them and to direct them to the resources these populations needed to achieve a positive outcome.

A pilot project by Andrich and Foronda (2020) as done to find the relationship between DSME and A1C management. A total of 24 patients were observed for a period of 4 weeks. All 24 participants completed the project. Most participants were male (62.5%). The average age of participants was 74 years ( $SD = 6.4$ ). All participants had a diagnosis of DM2 with an average duration of 7.5 ( $SD = 5.4$ ) years and an average A1C of 7.7% (61 mmol/mol) ( $SD = 0.8$ ). The conclusion was that the study showed increased use of DSME/S improved patients' glycemic control and quality of life (QOL). Although the duration of the project was not long enough to evaluate sustainability of this practice change initiative, the significant increase in use of DSME/S was promising. During the 4-week pilot project, patients demonstrated success in significantly lowering their FBG. The study outcomes demonstrated the effectiveness of these guidelines in improving glycemic control. QOL was assessed using the five domains of diabetic control, anxiety and worry, social burden, sexual functioning, and energy and mobility, with all areas being affected positively. These aspects are vital in assessing life satisfaction of patients

with diabetes as diabetes affects many aspects of an individual's personal and social life the study concluded.

McGowan et.al., (2019) researched the viability of recruiting, training, and pairing peer coaches with patients with type 2 diabetes and whether telephone coaching enhances health outcomes. At 12 months, the mean patient A1C level decreased by 9%; general health improved by 7%; fatigue decreased by 15%; activation increased by 15%; empowerment increased by 10%; self-efficacy increased by 23%; depression level decreased by 24%; and communication with physician increased by 22%. This pilot found that a sensible low-cost telephone peer-coaching intervention aided patient with type 2 diabetes to self-manage their diabetes in improved ways. Future replication and randomized trials are needed to validate these preliminary findings. An article written in the University of western Alabama (2018) shared Peer coaching is a type of helping relationship in which two people of equal status actively participate in helping each other on specific tasks or problems, with a mutual desire to be helpful.

### **Local Background and Context**

According to the Diabetes Research Institute Foundation (DRIF) (2019) report, there were approximately 30.3 million people in the US with DM2. The number translated to around 9.4% of the total population. New DM2 cases were estimated at 1.5 million in adults above 18 years. The American Diabetes Association, through a report, explained that diabetic individuals in Maryland, where this project site was located, amount to about 623,000 which translated to 12.6% of the population, (ADA, n.d.). Of these, 156,000 of them had DM2 and were not aware or diagnosed yet. Furthermore,

DRIF shared that 1,634,000 people in Maryland or a staggering 36.9% of the population are pre-diabetics. The report also showed between 2011-2012, the prevalence of kidney disease ages above 20 years and diagnosed with DM2, was around 36.5%. In 2014, around 52,159 people developed end-stage renal disease with DM2 as the primary cause. Patients with DM2 often develop the peripheral vascular disease that results in short- and long-term consequences of the disease.

Thiruvoipati et al. (2015) diabetes mellitus (DM) is a major risk factor for atherosclerotic disease as well as cardiovascular mortality and morbidity. Atherosclerotic disease, the writers shared, is not only increased in incidence in diabetic patients, but its course is also accelerated, thereby accounting for as much as 44% of all-cause mortality. DM related atherosclerosis can lead to problems in all major of vascular beds, including the coronary arteries, carotid vessels, and lower extremity arteries (Thiruvoipati et al. 2015) This DNP project was done at a primary care center with 70% DM patients; of which 45% are DM2. The nursing staff received the education that they adopted when teaching patients with DM2.

### **Role of the DNP Student**

The DNP student is responsible for the development of the proposed teaching and education for the health care staff at the primary care center. DM2 is a deadly chronic disease that can damage many organs. Without the knowledge, understanding and resources, a patient may develop hyperglycemia which could quickly become chronic without proper management. To achieve a social change, the DNP developed an

educational tool that taught health care providers at this clinic how to educate DM2 patient to self-manage.

### **Summary**

Currently, diabetes is one of the most frequently occurring diseases worldwide. Over the years, the globe has experienced a steady increase in the total of cases diagnosed with diabetes. As a result, it was apparent that a large segment of the population continued to suffer from this disease. Both diabetes patients and their family members maintained a struggle in managing diabetes due to the chronicity of the disease. This chronic disease required patients together with their family members to make a series of daily self-management decisions and undertake some complex self-care activities. To help manage diabetes as a chronic disease, nurses should guide patients through DSME. DSME provides the basis to enable patients with diabetes to incorporate and navigate the treatment decisions as well as activities into their lives. Such is required to ensure that patients with diabetes live a quality life.

The role of the DNP prepared nurse is to ensure, based on EBP that patients were receiving the right care that would produce a positive outcome. In this primary care office where the DNP project took place, there were insufficient teaching for DM2 disease patients, this created a gap in practice. At the end of the teaching modules, nurses were able to provide patients with the support necessary for implementing and sustaining their coping skills and behaviors to continually self-manage in DM2.

### Section 3: Collection and Analysis of Evidence

#### **Introduction**

DM2 is a chronic disease that requires education and support to effectively manage the disease. The healthcare workers at the primary care practice site for my DNP project provided that initial education; however, attention to self-care education on DM2 was not overseen at every visit. At this clinic, the DM2 patients needed further teaching and regular follow up about their disease and the management thereof. A lack of understanding about how to manage the disease has led to chronic hyperglycemia. According to Rochfort et al., (2018) teaching and instruction by health experts have been shown to be correlated with better uptake, application, and success of self-management programs. In this DNP project, the nurses were educated on strategies to use when teaching these patients about their disease in a way that improved compliance and reduced hyperglycemia.

#### **Practice-Focused Question**

DM2 patients at this primary care practice did not have the required knowledge about their disease to be able to manage it themselves. The healthcare workers at the practice did provide that initial education, but self-care education on DM2 was not an ongoing process. The meaningful gap in practice was the lack of follow-up, as well as the lack of provision of tools and resources needed by these DM2 patients. DM2 patients need more than an initial patient education session to better control and prevent chronic hyperglycemia. With available teaching and understanding of the disease, other tools



such as the use of technology may play a role that can affect the patient's response and compliance with DSME.

The practice-focused question for this DNP project wants to find out to what extent an educational program provided to primary care staff will help DM2 patients prevent chronic hyperglycemia. The Powers et al (2016) shared that nurses must understand everything about DM2 to adequately teach these patients. The healthcare workers at this practice received the education from the application of this DNP project so that they can in turn pass it on to the patients during their initial visits, follow-up phone calls, and consecutive follow-up appointments.

### **Sources of Evidence**

#### **Published Outcomes and Research**

The databases for this project included Medline with full text, CINAHL with full text, ProQuest nursing, and allied health source, Pubmed.gov using the Walden library and Google Scholar for evidenced-based practice information. My search also included recommendations from the CDC, WHO, ADA, United States National Library of Medicine, National Institute of Health, and AADE. Refining my search by adding a word or removing or replacing some other word gave me more precise study materials for my project. Keywords used in this project included *diabetes*, *DM2*, *hyperglycemia*, and *DSME/S*.

#### **Evidence Generated for the Doctoral Project**

The current practice at the study site clinic was that patients received the initial teaching at the time of diagnosis and no further teaching was offered after that. This

represented a gap in care that affected the knowledge that patients needed for their disease management. The stakeholders at this primary care were presented with evidenced-based practice information that was used to support DM2 patients who depend on the teaching and resources from this healthcare setting. The information could be used as a guide for DM2 for DSME.

### ***Participants***

The DNP project was an education module that was presented to 11 health care workers who had experience and could validate the realistic use and application of the teaching. There were 11 staff participants: two LPNs, seven RNs, and two nurse NPs at the primary care center who participated in a role-specific educational process with coaching.

### ***Procedures***

An overview of the educational plan can be found in Appendix A. The staff had the opportunity to test their knowledge in a pre- and post-test in Appendix B. The coaching plan and qualitative analysis of the education's impact on patient outcomes can be found in Appendix C. Sample case studies for the didactic portion of the training are found in Appendix D. The coaching section in Appendix C took place after 2 weeks from the start of the project to follow up and conduct a case study review of de-identified DM2 patients that emerged from staff's experiences.

### ***Protections***

The DNP owner and staff of this primary care center gave me full opportunity and access to work with every staff member to improve patient care with DM2, specifically.

This was also one of the clinics that I used for my practicum learning experience. However, the principles of privacy and confidentiality are governed by the principles of Walden educational project manual. The site had no IRB, therefore, the Walden IRB approved reference number 01-21-21-0662263 served as the IRB of record.

### **Analysis and Synthesis**

At the completion of the educational module, information was gathered and analyzed, and the average score was determined using the 5-point Likert multiple choice questions. Additionally, the pre- and post-tests were compared to see if there was an improvement in the knowledge acquired before and after the educational module. Finally, the coaching sections further addressed the solutions to case studies to support staff teaching and patient compliance.

### **Summary**

DM2 is a chronic disease that requires education and support to effectively manage the disease. The study site's primary care center only supported the patients initially when they were first diagnosed. However, a lack of understanding about how to manage the disease has led to chronic hyperglycemia. Rochfort et al. (2018) shared that teaching and instruction by health experts have been shown in the literature to be correlated with better uptake, application, and success of self-management programs. In this DNP project, the nurses were educated on strategies to use when teaching these patients about their disease in a way that can improve compliance and reduce hyperglycemia. Even if patients receive the teaching, some factors could reduce the

effectiveness of the teaching. Thus, DSME and DSMS are crucial to ensuring that patients follow-up as they should with the right resources.

#### Section 4: Findings and Recommendations

The DM2 patients at the project site's primary care center received initial diabetes teaching but were not educated on a regular basis. For this reason, they lacked the knowledge to manage their disease. According to Powers et al. (2016), DSMS is the support that is necessary for using and adopting coping methods and behaviors required to self-manage DM2 daily. The practice-focused question asked the following: To what extent will an educational program provide the primary care staff with the knowledge and skills needed to help DM2 patients prevent hyperglycemia?

My search included keywords like *diabetes, diabetes mellitus type 2, diabetes educators, hyperglycemia, HAIC, peripheral vascular disease, compliance, nonadherence, methods for successful teaching, teach-back process, cultural competence, empowerment, and self-care management*. I used databases like Medline with full text, CINAHL with full text, and ProQuest nursing with full text. My resources also included the CDC, the WHO, the ADA, the United States National Library of Medicine, the National Institute of Health, and the AADE and the diabetic selfcare management education and resources. I used the Boolean method to limit my quest to the last five years and used the terms *or, and, and not* in certain cases to narrow my search.

#### **Findings and Implications**

The pretest was given to 11 staff (two LPNs, seven RNs and two NPs). At the end of the training program, the posttest revealed that the nurses with higher education achievements received higher scores than those with a lower nursing degree. The Wilcoxon Signed Ranks Test, a nonparametric test that applies ranks to determine the

difference in the mean was used to pair the pretest with the posttest in this project. The average score at the pretest was 80, and the average score at posttest was higher, at 93.18, suggesting that the 11 staff members who participated in the education did improve in their knowledge of DM2. The skewness and kurtosis revealed that the data were not normally distributed due to the small dataset. However, the use of the nonparametric test can show if the change is statistically significant. The Wilcoxon Signed Ranks Test uses ranks to determine whether the average score represents a change or whether it is due to chance. The result of the pretest and posttest was significant ( $Z = -3.020, p = .003$ ). The  $p$  value here was very low, a conclusive result that indicates that if this test were repeated with a different sample after the education, the outcome would be similar.

In the qualitative component of my project, one of my teaching tools to staff participants was to encourage DM2 patients to journal their activities and blood sugar reading using technology such as a smart phone, or, for those patients who prefer, the use of their notebook and pen, to remind them to bring the information to all doctor visits and appointments. During our bi-weekly meetings, I shared case studies with the staff and encouraged them to share their experience and challenges when teaching adult patients. We discussed the scenarios from the case studies and went over the challenges they faced while addressing the issues with DM2 patients. These meetings also involved coaching sections. The feedback from staff was encouraging. They said many of the DM2 patients were pleased that their health was being considered. Some said that they felt that I cared so much about the patients that I supported the staff without judging. The barriers reported by staff were related to the fear of the current pandemic, where it became

challenging to have DM2 patients come in for a physical teaching and have a return demonstration to ascertain understanding. Using telehealth was not complete in this regard. Another barrier was that some patients not being teachable. Some patients believed that they did not need further teaching and when asked to show what they knew about the disease, they were not cooperative. This project can create social change ending in a positive outcome and improved quality of lives of DM2 patients and the staff at this clinic.

### **Recommendations**

The primary care center continues to use the project tools. The project will continue to provide guidance for the current and future health care staff at this primary care center as the tools remain on site. The education tool and manual were provided to the clinic to use as a resource for checks and balances. It is the recommended protocol to guide care and treatment for DM2 patients. To keep abreast with competency, the staff may review the information in the manual on a yearly mandatory basis. The clinician will keep track of the improvement in DM2 each patient's A1C levels by performing a quality improvement assessment in 6 months. The result can help them decide whether to continue with the project tools or revise to meet the everchanging needs of patients and staff.

### **Strengths and Limitations of the Project**

There were more strengths than limitations in this project. The first strength was the overwhelming support I received throughout this project. The staff and providers at the clinic were very cooperative and supportive despite the current COVID pandemic.

Another added strength was that the owner/provider at the study site is a nurse practitioner with a DNP in nursing. She was very supportive of the practice change and was pleased that I chose her clinic. The next strength was completing the project and providing the clinic with the blueprint and tools to teach and support DM2 patients.

One limitation was that I used one location for my project. Another limitation was doing a project during a pandemic. It was often challenging to work with all 11 staff at the same time. I had to make multiple trips when they were finally in the office. Moreover, the sample size was limited to one site, and it was very small, and so this represents an additional limitation. This notwithstanding, the project could easily be replicated at other sites.



## Section 5: Dissemination Plan

The purpose of this project was to provide the healthcare providers at the study site clinic with the required educational strategies to teach DM2 patients. DM2 is a disease that is challenging to manage. These educational tools can help bridge that gap. The project can be duplicated and applied in many healthcare settings. For more patients to receive the right teaching strategies, this project, when completed, will be submitted for publication in the Nurse Practitioner Journal to disseminate to a broader audience outside of the primary care clinic that served as the project site. I will also present the finished project at the American Association of Nurse Practitioners, where I am a member. Additionally, being a member of the advanced practice council at my place of work will enable me to share my project.

### **Analysis of Self**

As a practitioner, I understand the challenges of balancing patients with various chronic diseases and complaints. This project has enabled me to apply this education strategy as a basis for finding proven evidence in other chronic diseases. This way, I can help create social change that leads to positive outcomes and an improved quality of life. When there is a positive change in behavior, there is a reduced economic spending in that area, diverting the money to those who need it the most. It is satisfying to help improve lives of this population and as well as the economy.

As a scholar, I found that applying evidence to real life issues is fulfilling. Understanding what is at stake and finding evidenced-based practice to resolve real

problems, in a way to reduce the burden on the health of individuals and the economy is a worthwhile endeavor.

The pandemic in various part of the world complicated the project implementation. I needed to wear a mask while conducting my project, educate nurses, and coach nurses. I was determined to throw myself into my project and complete it. I wanted this clinic to receive the educational tools it needed to succeed in the care and management of DM2. The ability to educate, coach, and manage the staff at this clinic was both challenging and rewarding.

### **Summary**

The DNP-prepared nurse should always seek ways to create positive social change in the lives of patients and staff in their communities. As part of this completion of my DNP program, I was required to present a research project, one that supports care and bring changes to nursing practice and to the patient's experience. I chose a project that can help reduce the incidences of hyperglycemia in DM2 patients. The DM2 patients at the primary care center where this project took place were given an initial diabetes education but not on an ongoing, regular basis. As a result, the patients lacked the tools and resources necessary to manage their disease. The issue is how well an educational program could provide primary care providers with the expertise and tools they need to help DM2 patients manage their condition. To bridge this gap in practice, I educated the healthcare workers at this primary care center. There was a pretest and a posttest after the application of the education, and there was a significant improvement between the pre- and post-test. The significance that the scores improved after the application indicated

that my educational workshop was successful. With the resultant  $p$  value at .003, if the project were to be replicated, the results would almost certainly be similar.

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## Appendix A: Teaching Plan

<p>Learning Outcome: Educating the staff at a primary care center about teaching strategies to support DM2 patient using the DSME toolkit.</p> <p>Nursing Professional Development: Primary care staff will have a better understanding of how to support DM2 patient in their DSME efforts.</p> <p>Patient Outcome: Patients will experience fewer long-term complications such as hyperglycemia. Patients at the primary care site will have lower A1C levels.</p> <p>Organizational Outcome: The practice will earn additional revenue through the CMS provider reward program (MIPS)</p>			
Topical Content Outline:	Time frame	References	Teaching method/learner engagement and Evaluation method
Educate staff about the use of diabetes self-management education and support	10''	Powers, M. A., Bardsley, J., Cypress, M., Duker, P., Funnell, M. M., Hess Fischl, A., Maryniuk, M. D., Siminerio, L., & Vivian, E. (2015). Diabetes Self-Management Education and Support in Type 2 Diabetes: <a href="https://doi-org.ezp.waldenulibrary.org/10.1016/j.jand.2015.05.012">https://doi-org.ezp.waldenulibrary.org/10.1016/j.jand.2015.05.012</a>	Evaluation to exist current knowledge and competency
Overview of the teach back method for DM2	20''	Ha Dinh, T. T., Bonner, A., Clark, R., Ramsbotham, J., & Hines, S. (2016). The effectiveness of the teach-back method on adherence and self-management in health education for people with chronic disease: a systematic review. <i>JBIR database of systematic reviews and implementation reports</i> , 14(1), 210–247. doi:10.11124/jbisrir-2016-2296	Physical and virtual chat
Overcoming barriers to referrals and treatment options for DM2 patients	10''	Center for disease control and prevention. (2018). Overcoming barriers to referrals and treatment. Retrieved from <a href="https://search.cdc.gov/search/index.html#advanced">https://search.cdc.gov/search/index.html#advanced</a> .	Physical and virtual chat
The use of technology: journaling using the Apps on the phone to chart BS reading, meals. Journaling can alternatively be done with a notebook and pen	20''	Mynetdairy (2020) Diabetic tracker for iPhone Retrieved from <a href="https://www.mynetdiary.com/diabetes-tracker-for-iPhone.html">https://www.mynetdiary.com/diabetes-tracker-for-iPhone.html</a> The Johns Hopkins (2020). Patient Guide to diabetes: glucose logs. Retrieved from <a href="https://hopkinsdiabetesinfo.org/glucose-logs/">https://hopkinsdiabetesinfo.org/glucose-logs/</a> .	Physical and virtual chat

<p>Coaching: Coaching questions Appendix C. Coaching section is to ensure that the health care workers at this primary care understand their role as educators about this chronic disease.</p> <p>Case studies Appendix D</p>	<p>30'' At the end of week 4</p>	<p>IHI What Matters to me? <a href="https://theconversationproject.org/wp-content/uploads/2020/09/ConversationProject-WhatMatterstoMe-Workbook-English.pdf">https://theconversationproject.org/wp-content/uploads/2020/09/ConversationProject-WhatMatterstoMe-Workbook-English.pdf</a></p>	<p>Physical and virtual chat Case studies Role play</p>
<p>Evaluation of diabetes education in primary care</p>		<p>Gucciardi, E., Xu, C., Vitale, M. et al. (2020). Evaluating the impact of on-site diabetes education teams in primary care on clinical outcomes. BMC Family Practice 21, 48. <a href="https://soo.org/10.1186/s1275-020-01111-2">https://soo.org/10.1186/s1275-020-01111-2</a></p>	<p>Physical and virtual chat Case studies Role play</p>

## Appendix B: Pre- and Post-test for Clinical Staff Educational Tool for DM2 patients

1. DM2 is different from DM1 because it
  - a. Does not make enough insulin.
  - b. Makes no insulin at all.
  - c. Makes more than enough insulin.
  - d. None of the above
  
2. The onset of DM2 is
  - a. Both adult and child
  - b. Adult
  - c. Child
  - d. Later in life
  
3. DM2 is the
  - a. Most common diabetes
  - b. The least common diabetes
  - c. The same as DM1
  - d. None of the above
  
4. DM2 patients may be managed by
  - a. Medicine only
  - b. Medicine and insulin
  - c. Insulin only
  - d. None of the above
  
5. Diet and exercise may be useful in
  - a. Controlling DM2
  - b. Complicating DM2
  - c. Eliminating DM2
  - d. All the above
  
6. A healthy lifestyle
  - a. Is a negative step in diabetes patient
  - b. Is a positive step for diabetes patient
  - c. Is neither a good nor bad for diabetes?
  - d. None of the above
  
7. Weight loss in overweight or obese DM2 patient will help
  - a. Control insulin needs
  - b. Increase insulin demand.
  - c. Lead to hypoglycemia
  - d. All the above

8. Monitoring blood sugar several times a day
  - a. Has a positive outcome for DM2 patients
  - b. Makes blood sugar higher
  - c. Reduces blood sugar
  - d. Has no effect on DM2 outcome
  
9. A very high blood sugar is called hyperglycemia
  - a. True b. False
  
10. Patients who take part in DSME will avoid chronic hyperglycemia
  - a. True b. False
  
11. Complications from hyperglycemia results in
  - a. Multiple organ damage
  - b. Loss of vision
  - c. Hemodialysis dependent
  - d. Lower extremity amputation
  - e. All the above
  
12. DM2 patients should be taught that DSME includes
  - a. A healthy lifestyle choice
  - b. Diet and exercise
  - c. Blood sugar management
  - d. All the above
  
13. DM2 patient who follow the DSME
  - a. End up with diabetes complications
  - b. Are informed about their disease
  - c. Do not have a clue about their disease
  - d. All the above
  
14. DM2 patients need to have a regular annual vision check
  - a. True b. False
  
15. It takes multidisciplinary departments to support the DM2 patient
  - a. True b. False

## Appendix C: Coaching Guide

This coaching section is to ensure that the health care workers at this primary care understand their role as educators about this chronic disease. It will be a time to discuss the challenges they face as they reach out to their patients. I will present case studies to the team and offer each person the opportunity to decide intervention. Staff will also be encouraged to bring their experiences with patients as case studies that can be used as a teaching opportunity in the coaching sections about directions and interventions when similar issues present.

They will be expected to answer to open ended questions below:

1. How do you think this teaching helped you to support the DM2 patients better?
2. What made this teaching challenging?
3. How do you think the teaching process can be improved?
4. What challenges did the patients face?
5. How did the patients receive the teaching?
6. Discuss one or two diabetic patients who you saw in the last week, where the evidence of the training was helpful.
7. What would you like to add to this teaching?
8. What changes have you observed in the FBS of your patients.

## Appendix D: Case Studies

1. A 44-year-old male patient with DM2 for 3 years. He is married and has 2 teenage children. The family is supportive. He keeps a journal and maintains his recommended diabetic diet using technology diabetes app on his phone. He takes 1000 mg metformin tablets twice a day and has lost about 25lbs of his 50 lbs goal in 16 months. He walks 2 miles three times a week. He routinely monitors his blood sugar three times a day. His A1C is less than 7. He reports a blood sugar spike in 24 hours ranging from 215 to 238 to 250 respectively in three different testing after attending a ceremony with his family where he decided was going to be his cheat day.

Q. What resources does this patient need?

2. A 61-year-old female patient with DM2 for about 16 months lives alone. She began journaling early on when she was first diagnosed manually, using a notebook. She stopped journaling after 5 months. Her A1C level is 7.5. She gets her meals through meals on wheels and drinks about 3 to 4 12 oz cans of regular carbonated drinks a day. She often has upwards spikes in her blood sugar reading and covers with insulin pen. She is depressed about her diagnosis. She falls into the category of patients that partially compliant due to the demands of the disease.

Q. What type of teaching and support does this patient need?

3. A newly diagnosed DM2 52-year-old female patient lives with her adult son. She gets the initial teaching about her diabetes from her health care provider. Despite what she is taught, she gives herself a long-acting insulin before bedtime but reports that she does not bother checking her blood sugar because she cannot bear the pain of the lancet. She keeps a manual journal, recording her meals, and activities. She is due to have her A1C checked on the day she reports to the clinic.

Q. What do you think her A1C levels will be? And why? What can you do to support her? What are her learning needs?

4. A 60-year-old Caucasian female with DM2 lives with family. When she was diagnosed, she asked and received all she should know to be DSME compliant. She has maintained a blood sugar level of between 115 and 130 by following her dietician's recommended diet. She manually logs in activities in a notebook. She gets adequate hydration and sleep. She is motivated and committed to take her health seriously. Her A1C 6.0. She sees her eye doctor, endocrinologist, and primary care provider regularly. She monitors for changes on her feet and has a podiatrist consult number for when she needs it. She also maintains a healthy weight.

- Q. What are her learning and support needs? How often should she visit the PCP?
5. A 39-year-old African American male diagnosed a year ago with DM2 is aware of his disease and is a technology savvy. He logs in his diet and activities on his phone using a diabetes app. He also logs in his meals to make sure he is not eating too much carbohydrate. He follows a weight management program online. His A1C is 6.5. He is overweight and is presently using the app for fitness weight reduction. He is compliant with managing DM2 and DSME.
- Q. What are his learning and support needs? How often should he visit the PCP?