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Decreasing Acute Diabetes Complications Through Self-Management Education

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This is to certify that the doctoral study by

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has been found to be complete and satisfactory in all respects,
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Abstract

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MS, Walden University, 2005

BS, The University of the State of New York, 1993

Project Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Nursing Practice

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Abstract

Diabetes mellitus is a chronic disease that affects millions of people in the United States. The purpose of this project was to develop a guideline to help clinical staff provide clear and concise diabetes self-management instructions to patients in a community setting. Orem's self-care deficit theory (SCD) and health belief model (HBM) provided a platform to assess how patients' self-care deficit contributes to illness and the effect of patients' perception of illness. SCD theory and the HBM provided the framework for the development of the guideline to decrease diabetes acute complications through self-management education. The practice-focused question was whether the diabetes treatment guideline would decrease diabetes complication, improve the quality of care received by the diabetic patients, and if the facility would adopt the developed guideline. AGREE II Tool was used to assess the quality of the guideline and the staffs' desire for the adoption of the guideline. Data were collected from questionnaires given to staff members at the practice site in 2 rounds. Six medical staff were asked to critique the initial guideline, and 5 medical professionals were asked to assess the final guideline. Most of the participants' scores indicated strong agreement that full consideration was met. The score in all 6 AGREE II domains was above 90%, and 100% of the participants recommended the guideline to be adopted in the facility. Data analysis indicated the diabetes practice guideline is valid, will enhance the treatment of diabetes, and the practice site employees were eager to adopt the treatment guideline. Findings may be used to increase population health and reduce acute complications from diabetes mellitus.

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Dedication

I would like to dedicate my DNP to my family, and in memory of my father, Lazarus Okafor. Health care personnel, who spend a tremendous amount of time providing care to patients, positively impacting their quality of life, and promoting evidence-based practice, are my source of inspiration, courage, and strength.

Acknowledgments

I would like to thank Almighty God for giving me the courage and determination in my academic endeavor. Thank you, my wife, Adaku, and my children, Emeka, Amaka, and Chinomso, for having patience with me for missing quality family time. Special thanks to my professors who spent time providing guidance and advice. My preceptor, Dr. Amakiri, was on my side throughout this project providing mentorship. I appreciate my family friend, Dr. Stanley, for the encouragement and words of wisdom that kept me focused on my studies. Credit goes to all Walden University faculty members who in one way or another contributed to the success of my DNP project.

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Section 1: Nature of the Project

The clinic site for this project is a family medicine clinic located in a low-income neighborhood; the clinic sees 30-40 patients daily. Most residents who attend the clinic are fixed-income retirees who are Social Security beneficiaries, and the major sources of health insurance coverage are Medicare, Medicaid, and the Affordable Care Act, popularly known as Obamacare. Most children who attend the clinic are on the Texas Children Health Insurance Program. The practice site has many patients with the diagnosis of diabetes mellitus (DM). DM can be debilitating and can incapacitate when complications develop. The physiological effects of diabetes are related to the adverse health effects of hyperglycemia (Chrvala, Sherr, and Lipman, 2016). Many patients do not appreciate the health hazards that diabetes poses until late in the disease process, when complications have developed, and the disease has advanced to a point of causing organ failure.

Staff at the clinic do not have sufficient time to teach patients the desired skills because they are limited to 15-20 minutes per patient for health history, physical examination, diagnosis, and treatment; not enough time is devoted to teaching and demonstrating the skills that diabetes patients will need to manage their health care needs. Because of the infrequent teaching and insufficient reinforcement of diabetes management education, many patients have hyperglycemia. When the clinic staff conduct teaching, they do not follow the diabetes management protocol. The role of the health care provider in diabetes management should be to decrease the effects of diabetes on the patients. Diabetes self-care, when combined with individualized and group intervention, has been demonstrated to be effective in

decreasing diabetes complications (Chrvala et al., 2016). Deakin, McShane, Cade, and Williams (2005) conducted a meta-analysis of 11 studies with 1,532 participants and found that group-based training for self-management strategies in people with type 2 diabetes was effective at improving fasting blood glucose levels, glycosylated hemoglobin, and diabetes knowledge and in reducing systolic blood pressure, body weight, and the requirement for diabetes medication. The goal of this project was to develop an evidence-based guideline for diabetes management at the project site. The guideline is supported by diabetes self-management education to increase knowledge of the project site staff in managing diabetes and improving patients' behaviors to reduce diabetes-associated acute complications. This project will provide patients with the tools, skills, and knowledge to prevent or delay the development of diabetes complications.

The diabetes care standards developed by the American Diabetes Association (ADA, 2016a) specify multifactor care with risk reduction strategies that go beyond monitoring serum glucose values. The ADA (2016a) states that ongoing patient-oriented self-management education and supportive care are critical to preventing acute complications and reducing the risk of long-term complications. When a diabetes self-management program is instituted early in the management of diabetes, complications are kept at bay, and in some cases diabetes and its associated complications can be reversed when combined with dietary modification (Power, Bardsley, Cypress, Duker, and Funnell, 2015). Diabetes self-management guidelines provide the opportunity for patients, clinicians, community members, and researchers to engage in frank discussions about treatment options, establish treatment goals, and

evaluate outcomes. Diabetes self-management education is a tool to improve diabetes and its associated complications, but it does not preclude clinical judgment; diabetes patients' preferences, cultural inclinations, and family dynamics must be factored into treatment plans and applied in the best available clinical care. Patients' preferences, inclinations, and educational capacities must be considered to ensure compliance with treatment plans. The guideline I developed for this study included consideration of the demographics of the diabetes patients who attend the practice site.

Problem Statement

The social and economic impacts of DM are considerable. Nearly 30 million Americans have diabetes, and 1 in 3 Medicare dollars is spent caring for people with diabetes and that result to diabetes and prediabetes costing Americans $322 billion per year, and 1 in 5 health care dollars is spent caring for people with diabetes (ADA, 2016b). The long-term economic and social impacts of the intervention for this study will manifest as fewer limb amputations, fewer diabetes complications such as retinopathy and associated blindness, and fewer instances of end-stage renal disease, which is responsible for high rates of dialysis. Brown et al. (2013) concluded that most diabetes-related medical costs stem from complications and comorbidities; Brown et al. indicated that preventing end-stage renal disease could save 300% to 500% through avoidance of kidney transplant. Savings from cardiovascular events such as coronary heart disease and congestive heart failure, as well as hemiplegia and limb amputations, would be 70% to 150% (Brown et al., 2013). Herman (2012) stated that 360% savings could be derived from preventing stroke, myocardial infarction, and revascularization procedures. The short-term impact of the intervention for this

study will be to increase diabetes patient self-management and decrease hyperglycemia and acute kidney disease. The long-term goal of diabetes management is to decrease the prevalence of diabetes and its associated complications and lower the social cost of managing diabetes complications (Chrvala et al., 2016).

The local need to address the complications of DM arose from the fact that large segments of the population who attend the clinic that was the site for this study have one or multiple diabetes complications that could have been prevented. Most patients who attend the clinic are elderly and do not have the basic education to comprehend the medical implications of not taking control of their health issues. Not adequately controlling diabetes could escalate to serious medical conditions that could result in considerable socioeconomic burden to patients and the community. Because diabetes complications can be prevented, it is prudent to institute a diabetes self-management program at the practice site. A review of practice site patients' medical records from 2012 to the present revealed that 75% of patients have a diagnosis of diabetes and have one or more diagnoses of chronic diseases such as hyperlipidemia, hypertension, and chronic kidney disease associated with diabetes. The more comorbidities the patients have, the more complicated the task of controlling their diabetes. About 15% of the patients have prediabetes.

The significance of establishing an evidence-based diabetes guideline is that the treatment at the practice site will be channeled toward an effective and standardized health care management protocol that would alleviate the burden of diabetes complications. There is no current treatment protocol for diabetes management at the practice site; each provider treats patients with any treatment that

suits his or her preferences. This treatment pattern often leads to patients having uncontrolled HgA1C and fasting glucose serum levels, while other patients may experience hypoglycemia because of overmedication with sulfonylurea, insulin, and other hypoglycemia drugs such as metformin. In some cases, patients are not being treated at the initial manifestation of diabetes; instead the providers wait to see if the patients' glucose levels will return to normal. This approach works sometimes, but other times patients proceed to a symptomatic state and develop profound and uncontrolled hyperglycemia, dehydration due to polyuria, stage III chronic kidney disease, decreased vision, and foot ulcers. Establishing a diabetes treatment protocol at the practice site may improve the diabetes management at the clinic.

The ADA supports diabetes management protocols that emphasize self-management education aimed at preventing complications; the ADA recommended that diabetes self-management education be incorporated in diabetes treatment. The National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK, 2014) supports this and also recommends that diabetes patients maintain glucose levels within the normal range of HgA1c of 5.7% to 6.4%, which could be achieved with a diabetes self-management education protocol. Haas et al. (2012) noted that self-management is a critical element of care for people with diabetes and is necessary to prevent or delay complications. Other researchers have also supported diabetes management (Chen, Creedy, Lin, & Wollin, 2012; Sieber, Newsome, & Lillie, 2012; Tsiananga et al., 2012). In order for the practice site to manage diabetes patients' glucose levels and reduce diabetes complications, a comprehensive diabetes self-management protocol is necessary.

Purpose

The primary purpose of this project was to develop a diabetes guideline to improve diabetes patient self-management through education of staff and patients in the practice setting, a clinic in Texas. The secondary purpose was to raise awareness of the importance of adopting the diabetes self-management protocol. Diabetes management skills may decrease the prevalence of diabetes complications by enabling staff to initiate diabetes treatment in accordance with the protocol and equipping patients with knowledge to take ownership of their health care needs and follow their treatment plans. The gap in practice that I addressed with this evidence-based project was the lack of a uniform diabetes guideline to control fasting serum levels, normalize HgA1C, and prevent diabetes complications. The at-risk population, 25- to 80-year-old diabetes patients, receives routine care at the clinic based on the discretion of the staff's treatment style, but the care is not based on an established guideline. A consistent approach was needed to reduce complications, improve patients' health status, and allow patients to live normal lives. The practice-focused questions for establishing a guideline for diabetes self-management education at the practice site were the following:

- Will implementing a diabetes guideline based on the concept of diabetes self-management education result in improved fasting serum and Hga1c levels among diabetes patients?
- Will a diabetes guideline increase the staff's awareness of the effective means of treating diabetes?

- Will the staff adhere to a diabetes guideline to maintain consistency of care for diabetes patients?
- Will a diabetes guideline improve patients' self-management of their diabetes?
- Will a diabetes guideline based on diabetes self-management education prevent diabetes complications?

Developing an evidence-based clinical practice guideline for teaching patients the essential skills for managing their diabetes care needs requires dedication from the patients as well as from the providers; it is a collaborative effort that requires patients to show commitment to the treatment plan. The providers also need to motivate patients to comply; staff efforts to motivate patients to follow the treatment plan may include encouraging patients to perform serum glucose checks at least once a day before eating, record their glucose levels for review at the office visit, make lifestyle changes, modify their diets, and take their medications as instructed. Diabetes self-management skills may improve patients' ability to control their serum glucose levels and may improve their self-image, physical agility, and emotional well-being. The gap in routine diabetes care practice that accounts for the high prevalence of diabetes complications at the practice site can be bridged by developing and implementing an evidence-based diabetes self-management program to educate patients and enhance their ability to control their diabetes and avoid complications.

Nature of the Doctoral Project

The sources of evidence to satisfy the purpose of the doctoral project included peer-reviewed journals; the primary databases were CINAHL, MEDLINE, and

Cochrane. Other sources of evidence were websites of the Centers for Disease Control and Prevention (CDC), the ADA, the NIDDK, and the American Academy of Nutrition and Dietetics. Most of the sources were found in the Walden University library. Sources included empirical studies, meta-analyses, and expert opinions on the subject.

It was also necessary to evaluate the staff's knowledge of diabetes guidelines even though guidelines are not used at the project site. The Appraisal of Guideline for Research & Evaluation (AGREE II) instrument was used to validate the guideline. The AGREE II instrument has been used in developing guidelines to improve patients' health outcomes, and it assisted in developing the evidence-based guideline for this study, ensuring that the guideline met the criterion of improving patients' health outcomes at the practice site. The data highlighted the gap in practice and affirmed the need to establish a guideline for treating diabetes patients based on diabetes self-management education (Browers, Mellissa, and Kerkvliet, 2016).

Significance of the Project

DM is a chronic and debilitating disease that has the potential to overwhelm patients when complications develop. Jack, Liburd, Tucker, and Cockrell (2014) noted that managing diabetes requires collaborative care between the patient and the primary care provider. Diabetes treatment guidelines that encourage health care providers to implement a collaborative approach may enhance patient cooperation and give the patient much-needed support. The stakeholders who should be involved are primary care providers, consultants, diabetes organizations such as the ADA and the Academy of Nutrition and Dietetics, support groups, patients' family members

and friends, local health care facilities, and community entrepreneurs. Each of the stakeholders has a role to play in diabetes management and funding programs aimed at decreasing the prevalence of diabetes and its associated complications. Well-known organizations such as the ADA and the Academy of Nutrition and Dietetics that advocate for effective diabetes programs play an active role in communities to increase awareness of diabetes and its associated complications. Local diabetes support groups are stakeholders who provide emotional support to relieve stress and inform patients that they are not alone in the fight against diabetes. Patients' friends and family members are also valuable sources of support and encouragement. A team approach to diabetes management includes comprehensive assessment and plans to address patients' values and circumstances (ADA, 2016a).

In 2015, American Academy of Nutrition and Dietetics noted that Dietary modification is an essential component of managing diabetes. Incorporating the diet recommendations of the ADA will enhance the effectiveness of diabetes self-management education and training. Guidelines from the American Academy of Nutrition and Dietetics (2015) focus on nutrition assessment, nutrition interventions, and nutrition monitoring and evaluation to promote positive clinical outcomes for patients with type 1 and type 2 diabetes. The input of stakeholders such as local organizations, educational institutions, and business leaders should be sought to address diabetes in the community.

Consistent education about diabetes self-management and the complications associated with uncontrolled serum glucose levels may help to increase patients' abilities to manage their diabetes and follow their treatment protocols. Studies have

shown that patients who are compliant with diabetes self-management education show dramatically fewer diabetes complications (Shrivastana, Shrivastana, & Ramasamy, 2013). Patients' knowledge and active participation in their care is a key ingredient in being compliant with medical treatment. Appold (2016) suggested that health care providers who maintain cordial professional relationships with patients facilitate compliance. A diabetes practice guideline should contain recommendations on removing patients' barriers to adherence to treatment plans. Programs designed to decrease the prevalence of diabetes should increase awareness among community members regarding the adverse effects of diabetes and the types of assistance community members could provide to support the program.

Establishing a diabetes guideline at the project site for this study was the first step in decreasing diabetes complications among patients who attend the clinic. Implications for positive change in diabetes self-management include decreasing patients' economic burden, increasing patients' productivity, improving patients' quality of life, and decreasing hospitalizations. In 2014, 14.2 million emergency department visits were reported with diabetes as a listed diagnosis among adults aged 18 years or older, and 7.2 million hospital discharges were reported with diabetes-related outcomes that included limb amputation, renal failure, stroke, and ischemic heart disease (CDC, 2017). Patients with DM may have short life spans due to complications when serum glucose levels are uncontrolled. Maintaining a controlled glycemic index requires primary care providers' assistance and patients' commitment to treatment protocols. Consistent patient education and training regarding diabetes self-management may result in more effective diabetes management and fewer

complications such as hyperglycemia, acute and chronic renal failure, and chronic urinary tract infections.

Summary

DM is a chronic disease that leads to complications such as renal disease, but diabetes self-management education may decrease diabetes complications; early complications could be reversed with effective treatment plans. Developing a guideline that providers at the project site will use in treating diabetes patients was an appropriate step in managing diabetes and decreasing complications. Diabetes self-management education involves empowering patients to take ownership of their health and encouraging compliance with treatment protocols. Compliance with treatment plans could be enhanced if health care providers establish cordial professional relationships with patients and encourage them to be active participants in their health care needs. Stakeholder involvement in diabetes self-management has a positive impact on the health of diabetes patients. A diabetes self-management guideline may improve the care rendered to diabetes patients who seek medical treatment at the project site.

Section 2: Background and Context

The prevalence of DM continues to increase and has triggered an urgent need to manage the disease and its associated complications (National center for Chronic Disease Prevention and Health Promotion, 2017). Health care facilities are in unique positions to reduce the incidence of diabetes, but efforts will require adopting evidence-based treatment guidelines. An important component of the guideline developed for this study is diabetes self-management education. It is important for health care facilities to adopt the most current guidelines rather than using outdated ones for there are many standards-of-care practices for treating diabetes, but many of these practices have not yielded encouraging results because of the inherent deficiencies (Standiford, Vijan, Harrison, Richardson, and Wyckoff, 2017). Facilities that do not have a diabetes care guideline empower staff to perform every aspect of diabetes care at the provider's discretion, and patients have no responsibility for their health care needs; this approach only creates dependency and lack of patient ownership of the disease. Because patients are not empowered to be proactive, diabetes complications may continue unabated. The National Center for Chronic Disease Prevention and Health Promotion (2017) noted that adults with diabetes and hypertension or both have a higher risk of developing chronic kidney disease than do those without the disease, and one in three adults with diabetes might have chronic kidney disease, and approximately 30 million (15%) U.S. adults are estimated to have chronic kidney disease (CKD), 48% of those with severely reduced kidney function but not on dialysis are not aware of having CKD, and most (96%) people with kidney damage or mildly reduced kidney function are not aware of having CKD; every 24

hours, more than 130 people with diabetes begin treatment for kidney failure. Studies have shown that patients who are overweight and have DM type 2 can prevent or delay the disease by losing 5-7% of their body weight, or 10 to 14 pounds for a 200-pound person (National Center for Chronic Disease Prevention and Health Promotion, 2017).

Diabetes complications are not limited to chronic kidney disease; many body organs are affected. Diabetes has been linked to the development of hypertension, urinary tract infection, hyperlipidemia, and hyperglycemia (ADA, 2016b). The relative risk of cardiovascular disease for persons with diabetes is at least double that of persons without diabetes (Colosia, Palencia, & Khan 2013). The purpose of this project was to develop a guideline to improve diabetes self-management knowledge through education among patients at a clinic practice site to decrease diabetes complications. The site staff will teach patients the necessary skills to prevent diabetes complications, thus empowering them. Diabetes self-management education is an evidence-based clinical practice that, when put into effect, decreases and delays diabetes complications (Standiford et al., 2017). The chronic nature of diabetes presents a formidable health care challenge to patients and health care providers, and the lack of an evidence-based guideline with emphasis on diabetes self-management education at the practice site may account for the increases in diabetes complications due to intrinsic and extrinsic factors which affects diabetes management (Rodriguez, 2013).

This DNP project included the concepts, models, and theories that guide the decision-making of providers in educating patients on diabetes self-management; the

models and theories are relevant to the practice of nursing. The model involves explaining the factors that lead to self-care deficit, designing the best approach to promoting diabetes self-management, and tailoring the approach to specific individuals or groups. The project included descriptions of how nurses should teach patients the skills of managing diabetes to prevent or delay complications.

Concepts, Model, and Theories

This project entailed using a dual-theory approach to explain how self-care deficit could contribute to disease complications, how the patient's perception of threat from the disease could lead to the patient's desire to seek treatment, and the benefits of instituting the desired intervention by health care professionals. When patients perceive that their health is deteriorating, they may decide to seek treatment. Unfortunately, complications that set in may not be reversed easily when patients seek treatment for their chronic disease. Health care facilities and providers could equip patients with the necessary tools at the early stage of their disease. Understanding the concepts and models of patients' behavior may help providers in implementing effective programs that could enhance patients' quality of lives.

Self-Care Deficit Model

Appropriate models for a diabetes self-management skills program aimed at curbing diabetes complications are the self-care deficit model and the health belief model (HBM). The self-care deficit theory proposed by Orem is a combination of three theories consisting of the theory of self-care, the theory of self-care deficit, and the theory of nursing systems (Nursing Theories, 2011). Self-care refers to the activities patients carry out to maintain their health, and self-care deficit refers to

activities patients are unable to carry out due to factors such as age, infirmity, and disability. Nursing systems are interventions performed on behalf of patients.

Self-care deficit theory explains why DM complications could develop rapidly in some patients, and the HBM explains how patients' perceptions of their disease may influence their decisions to be proactive in managing their diabetes. Love and Pinkowitz (2013) noted that it is important to focus on the strengths of the person living with the chronic disease rather than on diminished or lost abilities and capabilities. The main concept of the self-care deficit model is that due to certain therapeutic factors, patients may lack the knowledge or the skills to maintain optimum health or may be unable to provide self-care needed to sustain health. Health care professionals should step in to fulfill those roles patients are unable to perform. Therapeutic self-care theory includes the role nurses should play in meeting patients' self-care needs when patients cannot do so effectively themselves.

When personalized care is given to patients with self-care deficits, such as elderly patients with diabetes, patient satisfaction improves (Brunisholz, Briot, Hamilton, Joy, Lomax, and Barton, 2014). Not all patients with diabetes have the same ability to provide therapeutic self-care. The nurse evaluates the patient and determines whether he or she can administer his or her treatment plan. If patients have health care maintenance challenges, the nurse will facilitate family members' involvement in patient care. When family members are not available, a third party may be needed; third parties may include friends, home health agencies, or assisted living facilities. A key concept in the theory is individualized patient-centered care. Complications associated with DM can have devastating consequences for patients'

quality of life, but these complications can be delayed or prevented if the disease is controlled and managed (Brunisholz et al. 2014).

The self-care deficit could occur in several ways, such as lack of understanding of DM pathophysiology, lack of knowledge of the effects of uncontrolled DM, lack of interest in diabetes management, or inability to afford treatment. Illiteracy and poverty can also result in self-care deficits, and in some cases, patients may develop complacency and treatment fatigue, which can be categorized as self-care deficit. Self-care deficits can also manifest differently by age, making it imperative to develop diabetes treatment guidelines that are tailored by age. Self-care deficit model could be used to teach diabetic patients to take ownership of their disease and participate actively in their health care needs, thereby improve the quality of life (Borji, Otaghi, and Kazembeigi, 2017).

An advantage of being aware of the self-care deficit model is that it enables providers to identify patients' needs, and when needs are identified, nurses provide the needed care. The theory of self-care deficits suggests that medical providers—particularly nurses—should implement measures that assist patients to optimize their health care and that nurses should directly intervene and provide care to patients with self-care deficits. When self-care deficit theory is applied to the care of patients with DM, the outcomes are favorable in terms of providing care that DM patients cannot provide themselves and avoiding complications. Orem's self-care model is shown in Figure 1.

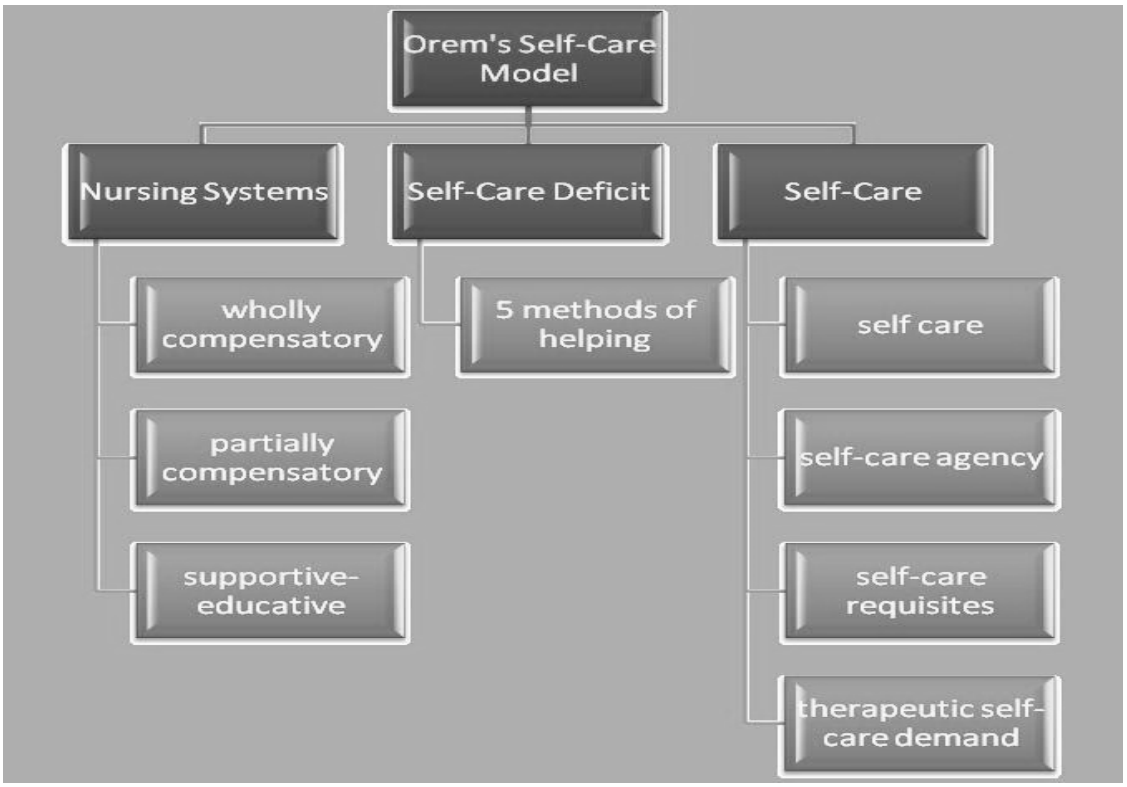

Figure 1. Orem's self-care model.

Health Belief Model

The HBM is the social psychology model that is most often applied to clinical settings. The HBM consists of five concepts: perceived susceptibility, perceived severity, perceived benefits, perceived barriers, and self-efficacy (Shabibi, Zavareh, Sayehmiri, and Omid (2017). There are also factors that lead patients to seek treatment. Patients' perceptions of susceptibility to ill health and disease, of the potential severity of the disease, and of the benefit of treatment are the strongest motivations for seeking treatment. Patients need to overcome barriers to seeking medical treatment, such as financial hardship and lack of health insurance, lack of transportation, and complacency about their health. Another barrier to seeking medical treatment is lack of knowledge and fears of the unknown. However, patients

are likely to adhere to their treatment plans if they think they are getting answers to their questions, having their treatment options explained, and receiving assurances that medical intervention will cure or control their disease. The development of self-efficacy entails self-confidence in decision-making. Health education through the HBM promotes self-care behaviors (Shabibi, 2017).

A patient with diabetes who believes that the disease has no serious consequences and does not understand the susceptibility to avoidable complications such as limb amputation, blindness, and chronic renal disease may not comply with treatment plans. However, the HBM could be used to change patients' behavior; the model is based on illness prevention. By defining health as a positive state of wellness, nurses can assist patients in attaining healthy lifestyles (Hendricks, 2016).

The HBM and self-care deficit theories are complementary, and the combination of both theories could be synergistic to clinical practice theory and enhance care in a holistic manner. Although the HBM (Figure 2) is a social psychology model, it has relevance in nursing practice and forms the framework for much nursing research. The model focuses on the motivations for patients to seek treatment but does not consider factors that may affect patients' behavior.

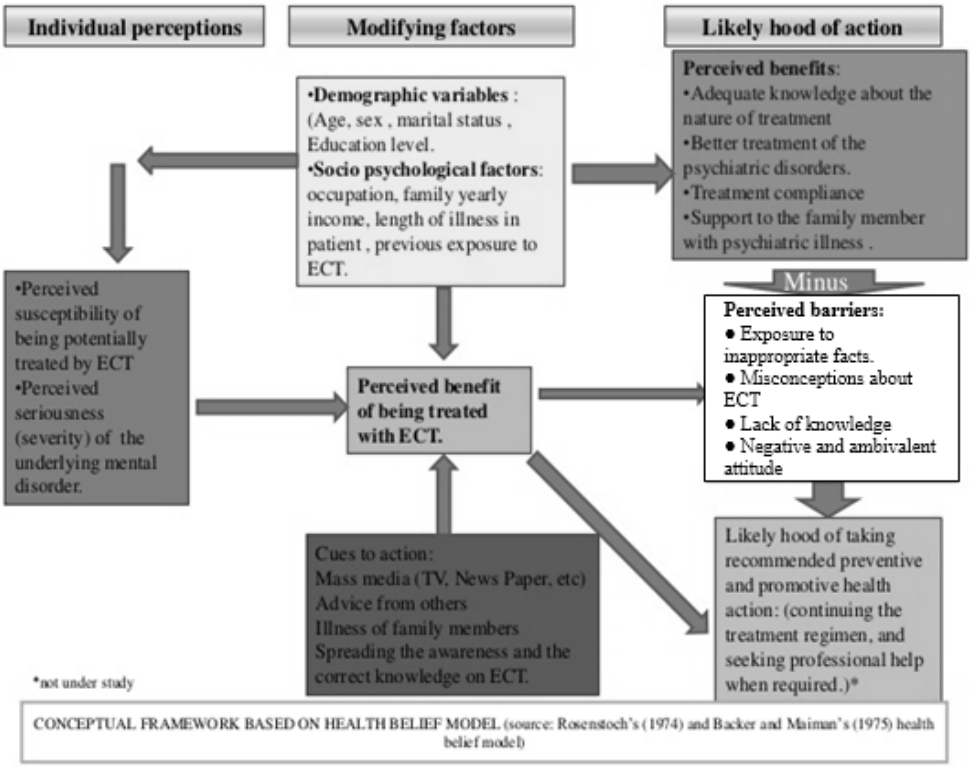

Figure 2. Health belief model. Retrieved from https://www.google.com/search?safe=active&biw=1920&bih=949&tbm

Relevance to Nursing Practice

Nurses are at the forefront of primary care and therefore are in frequent contact with patients with diabetes; nurses at all levels of care for these patients. It is a duty for advanced practice nurses to apply evidence-based research findings to clinical settings, and diabetes self-care education has been proven to prevent or delay the emergence of diabetes complications. A key aspect of diabetes self-management education is to motivate patients to take charge of their health care needs, and one of the purposes of this study is to highlight the effect of motivating patients to be active in their health care. Adding motivational therapy to diabetes self-management skills

as a means of encouraging and motivating patients to participate actively in their care is helpful. A recent study conducted by Chen et al. (2012) provided important evidence concerning the positive effect of motivational interventions in diabetes self-management education and glycemic outcomes. The authors randomly allocated 250 patients with diabetes to either a motivational interview group or the usual care group from baseline to three-month follow-up. The patients in the motivational self-management education group achieved greater control of their diabetes than did the patients who received usual diabetes care by maintaining HgA1c levels below 7.0.

Another dimension to diabetes self-management is for nurses to collaborate with other health care professionals in managing the disease. The goal is to maintain recommended serum glucose levels between 70 mg/dl to 126 mg/dl and HgA1C below 7.0 (ADA, 2016a). Collaboration among providers was an integral component of the diabetes-self management education program reported on here; for this study, I explored the synergistic effects of collaborative care to diabetes self-management education. Sieber et al. (2012) examined the efficacy of collaborative approaches in the self-management of patients with diabetes, noting that traditional diabetes education tends to suffer from low patient participation rates and is often not coordinated among health care team members.

Diabetes self-management should expand beyond the traditional approach to include coaching patients with diabetes on a variety of health behaviors and using clinic based-staff who are trained to reach out to patients proactively to initiate self-management behaviors by promoting shared decision-making. Shared decision-making entails health care providers' actively involving patients in their diabetes

management, allowing patients to take ownership of their learning processes and take the initiative to manage their health care needs. The role of the provider is to support, guide, and coach the patients in the diabetes self-management education and skills.

The standard practices that have been used previously to address the gap in practice at the clinic site for this study included the health care providers' monitoring patients' glucose at the practice site rather than giving the patients logbooks so they can record and review fasting glucose levels. Other missing pieces of diabetes management are not reinforcing lifestyle changes or encouraging exercise or dietary modification. Patients were not taught to periodically calibrate their glucometers, conducting teaching physical self-examination skills was ignored, and staff decreased their efforts at encouraging patients to join support groups. Evidence-based diabetes self-management incorporates several aspects of care, and it has been shown to be effective in decreasing diabetes complications. Tshiananga et al. (2012) conducted a meta-analysis of 34 randomized controlled trials (RCTs) with a combined cohort size of 5,993 patients with mean age 52.8 years. The authors found that nurse-led diabetes self-management education was associated with improved glycemic control; the program was also most effective among seniors and with a follow-up period of one to six months. The mean change in HgA1c was reduced by 0.70% for the nurse-led diabetes self-management education group compared with 0.21% in the group that received usual care; cardiovascular risk factors also improved. The diabetes guideline with self-management education, if implemented at the practice site, will go far in decreasing diabetes complications among the patients.

Local Background and Context

The practice site is a family medicine clinic located in a low-income neighborhood that is proximal to the downtown of a city in Texas and has been active in administering health care to the residents for over 15 years; most of the patients live within a 30-mile miles radius of the clinic. Most patients are beneficiaries of Medicare, Medical, and VA health insurance called Tricare. Most children who attend the clinic are on the Texas Children Health Insurance Program. The practice site staff consists of a physician, two nurse practitioners, a physician assistant, three medical assistants, front desk staff, one secretary, an office manager, an administrative director, IT staff, a volunteer retired registered nurse, and contract billing staff. The predominant ethnic group at the practice site is Latino; 90% of patients are Hispanic, 6% are African American, 3% are Caucasian, and 1% are Asian American; most patients speak English but prefer Spanish. Because some patients who are not proficient in English feel shy to speak English, the practice site has proficient bilingual staff for translation. The clinic is a family medicine practice, and as such, the clinical staff members treat patients of all ages. DM is prevalent among the clinic's patients; however, the target population is male and female patients with diabetes from age 30 to age 90. The practice site has no diabetes guideline, and the providers decide on patient treatments. My guideline with diabetes self-management education will ultimately help the practitioners treat patients and reduce diabetes complications.

Applying evidence-based diabetes self-management education will ultimately decrease diabetes-associated complications. At the project practice site, most patients

are Hispanic, although a sizeable number are African American. Office of Minority Health (2016) statistics indicate that Hispanics are 1.7 times as likely as non-Hispanic Whites to be diagnosed with diabetes and are 40% more likely to die from diabetes than non-Hispanic Whites. Latinos also have higher rates of end-stage renal disease caused by diabetes. In 2010, Hispanics were three times more likely to start treatment for diabetes-related end-stage renal disease than were non-Hispanic Whites. In 2010, Hispanic women were 1.5 times as likely as non-Hispanic White women to die from diabetes.

Many Latino dishes feature staple foods like beans, rice, and tortillas, all of which are high in carbohydrates (Olga, 2017). In addition, many Latino, including African American, foods are prepared using cooking methods that add unhealthy amounts of fat and salt. Many Hispanic meals could be prepared in nutritious ways without losing the flavor or the cultural composition. Food choices should be discussed during dietary counseling with patients. Specifically, care staff should be encouraging patients to make food substitutions such as substituting lean poultry for beef, brown rice for white, and wheat bread for white; eating larger portions of vegetables and fewer carbohydrates; and increasing their water intake. Patients tend to comply with treatment when they see its benefits in terms of fewer diabetes complications.

There is no physical activity designed specifically for patients with diabetes patients, especially elderly patients; however, physical activity has been shown to improve glycemic index and prevent diabetes complications. Physical activity does not necessarily mean training for a marathon; simple brisk walking or jogging around

the park or around the neighborhood may be sufficient to keep diabetes under control. Patients with a physical disability should be encouraged to engage in kinesthetic exercise as tolerated, weight lifting, and body building are also acceptable physical activities that diabetes patients should be encouraged to perform. There are community parks and recreational centers around the clinic project site, but few clinic patients that take advantage of these amenities. The care providers at the site do not encourage the patients to be physically active, and diabetes support group membership is low because providers do not refer the patients to the support group and the patients are not motivated to join the diabetes support group.

There are no known national, regional, or community laws that mandate health care practitioners to test diabetes patients' glucose levels, and there are clearly no laws that mandate practitioners to educate patients on how to manage their diabetes. At the clinic site for this study, care providers follow their own individual care models. Practice guidelines are not laws, but it is prudent for clinicians to follow evidence-based guidelines in providing care to patients.

Role of the DNP Student

Nursing as a profession requires the input of students, health care providers such as nurse practitioners and physicians, and allied health care staff in designing, implementing, and evaluating programs aimed at keeping patients healthy and safe. DNP students can expand the scientific basis for patient care (Association of American Colleges of Nursing, AACN, 2006); they could be agents of change by staying current with the latest research findings and determining how best to apply the findings in clinical settings. Nursing students can integrate nursing science with

knowledge from various disciplines to enhance and improve health care outcomes for patients. A DNP student may take the initiative to teach and coach patients on aspects of diabetes self-management that decrease, delay, or prevent the emergence of diabetes complications, although even after complications occur, steps can be taken to reverse or stabilize the condition.

The AACN (2006) stipulates that DNP students should focus not only on direct patient care but also on the needs of panels of patients, target populations, and broad communities. DNP students should also contribute their knowledge in improving nursing practice by demonstrating competence in quality improvement strategies and addressing the practice problems in view of new discoveries in nursing practice (AACN, 2006). DNP students can assess the risk to patients of unconventional nursing practices, identify system-based issues that need rectification, and discourage practices that do not facilitate safe care delivery.

A DNP student is a patient advocate; the advocacy role include advocacy for the nursing profession within the policy and health care communities and educating others, including policymakers at all levels, regarding nursing, health policy, and patient care outcomes (AACN, 2006). Nursing students teach patients basic skills of health maintenance; as it relates to diabetes and preventing complications, this role entails advocating diabetes self-management education because diabetes self-management is an evidence-based program that decreases or prevents diabetes complications. DNP graduates should be teaching patients skills such as glucometer calibration, how and when to check serum fasting glucose levels, administering medications including insulin, side effects of medications, conducting self-

examinations, modifying diet and lifestyle, increasing physical activity, and joining support groups. The DNP graduate's role could be summed as providing clinical leadership by designing and implementing practice guidelines, mentoring personnel, and educating patients.

Role of the Project Team

Effective teamwork is an essential component for the delivery of high-quality patient care in increasingly complex medical environments, and effective practice teams depend on improving teamwork, increasing organizational care processes, and decreasing risk of care staff burnout (Deneckere, Euwema, Lodewijckx, Panella, Mutsvari, Sermeus, and Vanhaecht, 2013). Creating an interdisciplinary team with the right professional skills is vital for the successful execution of the diabetes self-management developed for this study. The team members assumed specific roles based on their skills, and the team's collaborative duties were divided into small units for efficiency and accountability. The team comprised me as the team leader, a nurse educator, an administrator, the secretary, the information technologist, and the medical director for purposes of reviewing the guideline that will be developed. The team met two to three days a week on Monday, Wednesday, and Friday evenings at the end of the regular duties so as not to disrupt clinic operations. Regular meetings afforded us opportunities to share expertise knowledge, deliberate on evidence findings, and give input on the project. The team members' duties were as follows:

- As a project team leader, I led, directed, and approved team activities. The activities included initiating the diabetes self-management education in the practice setting but also analyzing the most research findings, case studies,

and expert opinions on the diabetes self-management program education as well as assessing the impacts on patients from the program. Other team activities involved writing the diabetes self-management guideline as well as developing the implementation strategy including how to present the guideline to the stakeholders. I developed the curriculum for orienting the clinic's allied health care staff setting and the teaching methodology for improving patients' skills at self-management of their diabetes. I established evaluation criteria that assessed the planning, implementation, outcome, and effectiveness of the program.

- The nurse educator's duty, once the guideline is approved, will be to educate and train the staff on the diabetes self-management education process and supervise the self-management education. The goal is to teach patients the skills needed to prevent or reverse acute diabetes complications.
- The office administrator sent out the meeting schedules to the team members and organized the meetings. The office administrator also participated in the project team's decision-making process and invited interested stakeholders to attend the meetings as observers.
- The secretary typed the project team's documents and keep track of the team's memos.
- The IT staff member provided computer troubleshooting and will prepare the PowerPoint presentation for the stakeholders. This role also includes maintaining the patients' electronic medical records and the database that

will contain the evidence-based guideline, protocol, and the project team's administrative strategy.

- The medical director is a physician who acted as a consultant to the design and implementation of the diabetes self-management education program. The medical director was responsible for validating the medical information and provided valuable medical information to the project. The medical director also participated in the project evaluation process.

Summary

The clinic practice site for this DNP project does not have guidelines on how to treat diabetes patients including decreasing the prevalence of diabetes complications, and because there are no guidelines, providers choose their own treatment methods. The increasing prevalence of DM complications has necessitated a need to develop and implement a diabetes guideline that includes diabetes self-management education at the practice site. Diabetes self-care management education has proved to be effective in managing diabetes and reducing the associated complications. The self-care deficit model may explain factors that contribute to diabetes complications, and the HBM explores patients' motivations to seek treatment. DNP students have a unique role to play in the maintenance of diabetes patients' health, including teaching patients needed self-management skills to improve their health.

Section 3: Collection and Analysis of Evidence

The purpose of this evidence-based project was to develop a guideline to improve patients' diabetes self-management knowledge at the practice site; providing care to patients using an evidence-based guideline that improves patients' health outcomes. To conform to the advanced standard of practice, the practice site needs to have a guideline that ensures that patients with diabetes are getting the best available treatment (Barcelo, Muzamil, and Qiang (2017). Increasing providers' and diabetes patients' awareness of evidence-based diabetes management may prevent or delay complications, and for patients who are already experiencing complications, an evidence-based diabetes self-management program at the project site may delay the progression of these complications and may possibly reverse them (Chrvala, Sherr, and Lipman, 2016).

The practice site has many patients with diabetes complications that resulted from the clinic's lack of a diabetes treatment protocol and from not encouraging patients to take ownership of their health care needs. The treatment failure at the practice site is evident, with 75% of diabetes patients having HgA1C above 7.0 and manifesting macrovascular and microvascular complications. A treatment protocol grounded in sound nursing theory, tested by research, and supported by evidence is needed to close the gap in practice at the project site and alleviate the frequent diabetes complications that affect patients. Researchers have conducted many studies on diabetes self-management, and the findings have supported that diabetes self-management reduces complications and empowers patients to take charge of their health care needs (Chen, Creedy, Lin, & Wollin, 2012; Sieber, Newsome, & Lillie,

2012; Tsiananga et al., 2012). I provide here an extensive literature review in Section 3; I present sources of evidence for this doctoral project, practice-focused questions, and analysis and synthesis of the data. Successful implementation of the diabetes self-management program to decrease complications at the project site may motivate other clinics in the community to adopt a similar program.

Practice-Focused Questions

The project site has no defined protocol or guideline for treating diabetes; instead, the providers at the facility use their own discretion in instituting the treatments they deem appropriate. When complications arise, the providers scramble to find solutions. For example, there is no treatment plan for patients with chronic kidney disease stage 3 with estimated glomerular filtration rate (eGFR) of 30 until the patients develop stage 4 disease with eGFR below 30 and end-stage renal disease. The providers are supposed to institute a treatment plan at stage 1 of the kidney disease to try to stop the disease progression.

An established standard of diabetes care through a diabetes self-management program is important to prevent diabetes complications. The first step in this endeavor is to teach patients how to maintain a tight glycemic index, adopt dietary modifications, and implement lifestyle changes. The practice-focused questions that guided the study were the following:

- Will diabetes complications decrease with a treatment guideline that contains diabetes self-management education?
- Will a diabetes guideline enable the health care providers at the clinic to provide efficient care to diabetes patients?

- Will the providers and the patients implement their respective recommendations?
- Will the practice site adopt the essential components of diabetes self-management education contained in the guideline?
- Will a diabetes guideline with self-management education improve patients' health outcome?

The purpose of this project was to decrease diabetes complications using a diabetes guideline that includes self-management skills at a community clinic. Developing a diabetes guideline for the clinic may result in conformity of practice and more consistent care. The overall goal is to improve control of patients' serum glucose values and reduce diabetes complications. Giving patients control over their health care by training them on diabetes self-management may motivate them to be proactive and adhere to their treatment plans.

Operational Definitions

Below I define the following terms for this project:

Cardiomyopathy. A chronic disease of the heart muscle in which the muscle is abnormally enlarged, thickened, and/or stiffened (Kumar, Abbas, Aster, 2015).

Diabetes guideline. A policy or procedure to determine how diabetes is managed and treated (Stedman, 2013).

Diabetes mellitus. A health condition in which the body's ability to produce insulin or respond to produce insulin is impaired (Kumar et al., 2015).

Evidence-based practice. Conscientious use of current best evidence in making treatment decisions (Stedman, 2013).

Glycemic index. How quickly foods break down into sugar in the bloodstream (Hall, 2015).

Health care outcome. The health status results for patients from health care services or interventions (Stedman, 2013).

Health care provider. A health care professional authorized to practice by the state and perform within the scope of his or her practice as defined by local, state, and federal laws (Stedman, 2015).

Hyperglycemia. Elevated glucose levels usually due to prediabetes, diabetes, or another metabolic syndrome (Kumar et al., 2015).

Macrovascular complication: Disease complication of any large blood vessel that may include the coronary arteries, aorta, and lower limb vessels (Hall, 2015).

Microvascular complication: Disease complication that affects small vessels such as the retina, kidneys, and nerves (Hall, 2015).

Protocol: A precise and detailed plan for the study and treatment of a disease (Stedman, 2013).

Renal failure: Kidney function that is below the expected parameters, which usually occurs in chronic diseases (Kumar et al., 2015).

Self-management education. Education on the knowledge, skills, and abilities patients need for diabetes self-care (Stedman, 2013).

Sources of Evidence

The Walden library databases were the primary sources of peer-reviewed articles, expert opinions, and case studies to inform my development of a diabetes

guideline that addresses diabetes self-management education and aims to prevent diabetes complications. Other sources of evidence included the CDC, ScienceDirect, the NIDDK, the ADA, the Association of Nutrition and Dietetics, and the U.S. Department of Health and Human Services. My search for the literature review centered on such sites as CINAHL, MEDLINE, Cochrane, SAGE, PubMed, and ProQuest. I also occasionally used Google Scholar to search for articles related to diabetes self-management programs.

I identified diabetes self-management studies and related studies about preventing diabetes complications. The key terms I used were *diabetes*, *diabetes guidelines*, *diabetes self-management*, *treatment of diabetes*, and *prevention of diabetes* complications. The search was limited to 2012 to 2017 to obtain five years of findings from peer-reviewed articles, professional journals, and case studies. The research yielded 2,504 articles related to diabetes self-management. The number of available articles decreased to 83 after I added diabetes complications to the second search and to 12 when I added prevention.

Published Outcomes and Research

Kent, Stuart, McKoy, Urbanski, Boren, and Lipman (2013) conducted a meta-analysis and found that complications associated with diabetes decreased with a diabetes self-management program. In the systematic review of risk reduction among patients in diabetes self-management, the authors reported that outcomes had improved by 79% immediately after the intervention but had reduced to 40% for long-term outcomes. The chronic nature of diabetes underscores the need to educate patients on diabetes management and provide services that support patients' efforts.

In another study conducted by the author, it was noted that preventive eye care for patients with diabetes decreased to 75% among residents in economically disadvantaged areas with fewer facilities that provide eye care. Diabetes is a leading cause of blindness among individuals aged 20-74 and the leading cause of kidney failure. Diabetes also confers a two to four times higher risk of stroke and rate of mortality from heart disease.

A team approach to minimizing diabetes complications is advised. This approach involves integrating patients' self-management behaviors with health care professionals' preventive care services. An effective self-management intervention was shown to decrease diabetic foot complications through patients' behaviors. Similarly, a multicomponent diabetes self-management training that included smoking cessation, eye care, and behavioral modification was shown to improve outcomes among patients with diabetes. The study supports patient empowerment in self-management education and the collaborative efforts of a multidisciplinary team.

Van Vugt, De Wit, Cleijne, and Snoek (2013) conducted 13 RCTs on eight diabetes self-management interventions for type 2 diabetes. The trials involved 306 articles. The combined total patient sample size was 3,813. By gender, 54.8% of the participants were female, and the average age was 57.2 years (SD 7.20); the average program completion rate in the study was 81.7% (SD 15.2%). Most of the participants were recruited from primary and secondary health care facilities. The inclusion criteria were diagnosis of diabetes for longer than a year, 18 years or older, fluency in English, and concern with web-based diabetes self-management programs. The exclusion criteria were control trials that were not related to diabetes, did not target a

diabetes self-management behavior, or only included type 1 diabetes. In the RCTs, five studies included patients with type 1 diabetes, and one study included patients who received interventions for chronic heart disease and chronic lung disease. The average duration of the studies was 6.69 months (SD 4.92). The assessment tools were patients' Center for Epidemiologic Studies Depression Scale scores; their fasting blood sugar (FBS), HbA1C, COPD, CHF, and renal dysfunction; and type 1 or 2 diabetes. The study authors found significant decreases in all the parameters and complications associated with diabetes when they combined diabetes self-management intervention with behavioral changes; 77% of patients had improved depression, 82% had improved HbA1c values, and 45% had significant improvement in self-care. The intervention group experienced 82% significant improvement in fatigue, pain, shortness of breath, reduction in disability, and renal and cardiac comorbidities. Notable differences of 79% were observed between the intervention and the control groups in the areas of physical and diet modification. Diabetes self-management programs when used in conjunction with behavioral change techniques improve the overall health outcomes and reduce the complications associated with DM. The limitation of this study was that there were only 13 randomized clinical trials.

Tang, Sinco, Piatt, Palmisano, Spencer, and Heisler (2014) conducted a randomized clinical study that compared a diabetes self-management education program led by a peer leader with one led by a community health worker to improve HbA1C. The research lasted for 12 months; 116 Latino adults with type 2 diabetes were recruited from health care centers and were randomized into two groups. Both

groups participated in a six-month diabetes self-management program followed by 12 months of monthly outreach delivered by the peer leader or the community health worker. Patients were assessed at 6-, 12-, and 18-month intervals. The study findings showed that the peer leader group achieved a reduction in mean HbA1C (8.2 to 7.5% or 66-58 mmol/mol), and the reduction in HgA1C was sustained at 18 months (-0.6%) from the baseline. The community health worker group also showed reduced HbA1c (7.8 vs. 7.3%) including at 12 months after the intervention (-0.3%). Tang et al. concluded that patients in both diabetes self-management programs, led by the peer leader and by the community worker, maintained improved diabetes outcomes and fewer complications.

Ricci-Cabello, Ruiz-Pérez, I., Rojas-García, Pastor, Rodríguez-Barranco, and Gonçalves (2014) showed the effectiveness of a diabetes self-management program in reducing diabetes complications in another meta-analysis. The researchers concentrated exclusively on African Americans and Hispanics in the United States. The authors studied 20 RCTs involving 3,094 patients and compared clinical outcomes for standard diabetes care with those from diabetes self-management behaviors. The findings of the study indicated that diabetes self-management reduced HbA1C by -0.31% (95% Cl -0.448% to -0.14%). The authors concluded that diabetes self-management education targeted at racial or ethnic minority patients did produce a positive effect on diabetes knowledge and on self-management behavior, ultimately improving glycemic control and thereby reducing diabetes complications.

Hernandez-Tejada, Campbell, Walker, Smalls, Davis, and Egede (2012) collected data on 378 adults with type 2 diabetes who were recruited from two

primary clinics in the southeastern United States. The authors evaluated the effect of diabetes empowerment (a form of diabetes self-management education) on patients' medication adherence and self-care behaviors. The authors conducted multiple linear regressions to assess the independent effects of diabetes empowerment for relevant covariates. The subjects were 83% non-Hispanic Blacks and 69% women, 22% were over 65 years or older, and 68% were not married. The authors determined that the diabetes empowerment had significant correlations with medication adherence and blood sugar testing, and the patients had overall success in managing their diet and reducing diabetes complications. Hernandez-Tejada et al. concluded that diabetes self-management was related to better knowledge, medication adherence, and improved self-care behavior. The authors further indicated that empowerment is an important factor in addressing diabetes to prevent complications.

Brunisholz et al. (2014) conducted a retrospective analysis of adults with type 2 diabetes who received diabetes self-management education. The purpose of the study was to determine the impact of diabetes self-management education in improving diabetes outcomes. The authors reviewed the records and data of 1,920 type 2 diabetes patients age 18 to 75 between the years 2011 and 2012 at an ADA-certified center in the Intermountain Healthcare facility in Utah. Three hundred eighty-four subjects received diabetes self-management training, and there were 1,536 patients in the control group who did not receive the diabetes education; most of the participants in both groups were Caucasian. Brunisholz et al. confirmed the impact of diabetes self-management education on improving HbA1C at an ADA center and demonstrated that patients who received the education were 1.5 times

more likely to improve their five-part diabetes criteria bundle scores within six months. Subjects who received the self-management education achieved an overall 1.36% decline in HbA1C compared with the 0.81% decline in HbA1C in the control group. A one percent decrease in HbA1c reduces cardiovascular disease risk by 15%, which is significant (Brunisholz et al., 2014).

The findings from the above studies suggest that the diabetes self-management education that I intend to incorporate into a clinic diabetes guideline will decrease diabetes complications; diabetes self-management education as part of treatment protocols leads to improved fasting serum glucose, HgA1c, and patient health. There are many variants of diabetes education, so I tailored the recommendations for my clinic guideline considering the demographics of the target patient population, such as education levels and cultural factors.

Archival and Operational Data

In order to know the extent of the practice site's challenges in managing diabetes patients, I collected site data and found that over 75% of patients with diabetes had consistently high serum glucose and HgA1c above the controlled limit. The clinic does not keep statistical data on the patients; I was able to calculate the number of patients with uncontrolled glucose levels from observation and from reading the levels in their records from the last six months. Of 200 patients whose files I reviewed, 190 had fasting serum glucose levels above 150mg/dl and HgA1C values above 7.0%. Of those 190 patients with uncontrolled diabetes, 70% had stage II or III chronic renal failure, hyperglycemia, and hypertension. The site leaders granted me approval to search the clinic database and collect data, which enabled me

to calculate a fair estimate of the number of patients who will benefit from a diabetes practice guideline. There is the limitation in the data collection that the sample of patients' charts that I pulled for analysis may not accurately reflect the percentage of patients with diabetes at the practice site.

Evidence Generated for the Doctoral Project

Participants. The six clinic staff members who were included in the initial review of the guideline were an employed veteran physician, one nurse practitioner, a physician assistant, two medical assistants with bachelor's degrees in the health care field, and a nonpracticing foreign medical graduate who works for the facility as a case manager. Five clinic staff who were included in the follow-up group are diabetes counselor whom patients are occasionally referred to, an endocrinologist who has his own clinic and who is not a practice site employee, and a physician assistant who has the diagnosis of DM type II; the others were the medical director, a nurse practitioner, and medical assistants with advanced degrees. I excluded four clinic staff members because they have minimal roles in diabetes management. I used the questionnaire to obtain the participants' feedback on the appropriateness of the recommended guideline. A total of 14 questionnaires were mailed to the project participants.

Procedures. I used the AGREE II instrument to collect the evidence-based data. The validity and the reliability of the AGREE II are well-known to be reproducible in research. After I developed the initial guideline for the clinic's diabetes treatment plan including self-management education, I distributed copies to the initial review group along with the project overview, coursework outline, instructions, and time frame to complete the questionnaires. Following discussion and

revisions based on the review group's feedback, I distributed a revised guideline to a final review group of 15 members.

Protections. The first step in the project execution was contacting potential participants and securing consent from those who met the inclusion criteria. I obtained written consent from the group participants indicating that they had voluntarily agreed to participate in appraising the guideline and offering their recommendations and evaluation under no coercion or force. To ensure that the participants' identities were protected, I have secured all documents in a locked cabinet located in a secured private area in the manager's office; the locks are coded and are accessible only to the team members. I strictly adhered to the Health Insurance Portability and Accountability Act, including using only the last four digits of participants' social security numbers instead of their names and addresses. I will instruct the other team members to keep participants' information confidential and not share it or discuss it, and not to access participants' files unless necessary. Additionally, any published data and findings will not contain identifiers. The project site computers, as well as the privately owned computers that will be used for the project, have firewall, antivirus, and malware protection, and the computers are also password protected.

Analysis and Synthesis

Walden University IRB approval was required before I could execute the project; when I received approval, I began the project. The Walden University issued IRB number is 06-01-18-0435161. The data analysis followed a two-step process, collecting the initial feedback from the first review and collecting the subsequent

feedback on the revised guideline. AGREE II is a tool that was developed to address the variability in guideline quality and to assess the methodological rigor and transparency with which guidelines are developed, including what information will be presented in guidelines and how (AGREE Consortium, 2017). The AGREE II instrument comprises 23 items and 6 quality domains: (a) scope and purpose, (b) stakeholder's involvement, (c) rigor of development, (d) clarity of presentation, (e) applicability, and (f) and editorial independence. I used AGREE II to develop the diabetes treatment guideline for the project practice site.

Summary

The goal of this evidence-based project is to introduce diabetes self-management as a standard of care in one clinic setting in a low-income community with the aim of decreasing acute diabetes complications at the clinic. Authors of several studies have demonstrated that diabetes self-management education does decrease associated complications. It is imperative that I convince the project site stakeholders to support the guideline because the clinic does not currently have any comprehensive diabetes treatment protocol. As a result of this lack, the clinic sees high prevalence of diabetes and diabetes-related complications. I developed a draft of a self-management education guideline, reviewed it with an initial clinic team, made revisions, and reviewed a revised version with a follow-up clinic staff team. In the next section, I discuss my findings from the two rounds of review of the diabetes self-management education I aim to see adopted as the standard of care in the facility.

Section 4: Findings and Recommendations

Diabetes patients need effective management of their chronic disease. At one health care facility with many providers who have varied levels of competence, I developed a systematic guideline with the intention of promoting consistent care for patients with diabetes. Before I developed the guideline, there was no protocol at the clinic, and providers implemented whatever practice they preferred; as a result, care was fragmented, inefficient, and ineffective. This lack of a diabetes treatment guideline could have been leading to treating diabetes patients in fragmented ways; patients' glucose levels were not being controlled, and many patients have developed diabetes complications.

Again, the purpose of this project was to develop a diabetes guideline that included diabetes self-management education to improve the clinic's diabetes treatment and reduce acute complications among clinic patients. Evidence-based guidelines are essential in managing patients with chronic diseases; gaps in care occur when treatments for chronic diseases—such as diabetes—do not follow effective protocols (Kristensen, Nymann, and Konradsen ,2016). I conducted this project to remedy the lack of an evidence-based diabetes treatment guideline that would close the gaps in diabetes care at the clinic and improve clinic practices. Once the clinic leaders adopt the guideline, patients will see improved quality of life through controlled serum glucose levels and will be empowered to take ownership of their disease through diabetes self-management education.

I obtained the evidence to support this project from the CINALH, Medline, and Cochrane databases as well as Google Scholar using the key words *diabetes*,

diabetes complications, *diabetes guidelines*, and *diabetes self-management education*. In several studies, diabetes self-management education was crucial in controlling patients' glucose levels and preventing or delaying diabetes complications. When implemented, the diabetes guideline will establish a consistent diabetes treatment protocol to improve patients' health outcomes and decrease diabetes complications at the practice site.

Findings and Implications

Analysis and synthesis of the evidence indicated that practice site employees were eager to adopt the treatment guideline. Eight clinic employees received a questionnaire to evaluate the proposed guideline: a veteran physician, two nurse practitioners, one physician assistant, three medical assistants, and a nonpracticing foreign medical graduate student who works as a case manager. I did not receive the physician's response in time, and one medical assistant did not respond at all; I thus received six responses. The medical assistant said that she had not had time to complete the questionnaire. The questionnaire I distributed to both the initial and final groups consisted of 14 questions, which are listed in Table 1. Table 2 contains the tabulated responses from the initial group, and Table 3 shows the responses from the expanded revision group. I received five responses from the latter group. Those five responses came from the medical doctor, a physician assistant, a nurse practitioner, a medical assistant, and a diabetes counselor.

Table 1

Initial and Follow-Up Group Questionnaire

Question	Details and Recommendations
#1	Are the scope, purpose, and overall objective of the diabetes guideline clearly defined in the recommendation? If not, please provide details on how to improve the scope, purpose, and the objective of the recommendations on how to improve diabetes treatment and monitoring.
#2	Are the patients' health problems specifically described and addressed clearly and concisely regarding diabetes treatment and monitoring instructions? If the statements are confusing, please suggest how to amend each statement to make it better.
#3	Did the guideline describe the target users and the population of patients, those with and without complications, whom the guideline is intended to address? Should prediabetic patients and high-risk patients be included in the guideline?
#4	Does any segment of the recommendation need more clarification? If needed, your suggestion on how to make the guideline unambiguous and specific will be welcomed.
#5	Does the guideline clearly present multiple options for diabetes management? Is there any evidence-based option you would like to include in the guideline?
#6	Are the key recommendations in the guideline easily identifiable to all the staff who would be using the guideline to treat and mentor patients? Which recommendations should be prioritized over others?
#7	Did the guideline contain instructions on how the treatment, mentoring, and monitoring of diabetes should be put into practice if approved by the clinic stakeholders? If not, what instructions would you like to be included?
#8	Have the potential barriers such as tools, educational materials, and time been discussed? State how such barriers could be minimized.
#9	Did the guideline consider potential costs to patients and the clinic of applying the recommendations? If not, how could cost savings be incorporated into the guideline?
#10	Did the guideline incorporate concern for the health benefits, side effects, and risks for patients in following the guideline? If not, what are the implications for the patient's health?

(*table continues*)

Question	Details and Recommendations
#11	Were the views and preferences of the health care providers, allied health care workers, and stakeholders such as the medical director sought in the development of the guideline?
#12	Are there key review criteria for evaluating how the goals set in the guideline can be achieved? If not, what are the parameters you would like to use to monitor the success of diabetes control?
#13	Does the guideline provide for updating the recommendations to stay relevant and continuously improving diabetes treatment practice to improve patient outcomes? Send your suggestion if needed.
#14	Are there conflicts of interest in the guideline for those who developed the guideline? How could such conflicts of interest be resolved?
	Overall Guideline Assessment
A.	Rate the overall quality of this guideline. 1, 2, 3, 4, 5, 6, 7
B.	I would recommend this guideline for use at the clinic.
Yes	
No	
Recommendations	

Table 2

Initial Group Questionnaire Responses

Question	Details and Recommendations
#1	Are the scope, purpose, and overall objective of the diabetes guideline clearly defined in the recommendation? If not, please provide details on how to improve the scope, purpose, and the objective of the recommendations on how to improve diabetes treatment and monitoring.
Responses	5 participants gave a rating of 7. 1 participant gave a rating of 6 but did not give any recommendation. 2 participants did not respond.

(*table continues*)

Question	Details and Recommendations
#2	Are the patients' health problems specifically described and addressed clearly and concisely regarding diabetes treatment and monitoring instructions? If the statements are confusing, please suggest how to amend each statement to make it better.
Responses	4 participants gave a rating of 7. 2 participants gave a rating of 6. The participant requested the etiology of the development of diabetes complications to be explained. 2 participants did not respond.
#3	Did the guideline describe the target users and the population of patients, those with and without complications, whom the guideline is intended to address? Should prediabetic patients and high-risk patients be included in the guideline?
Responses	4 participants gave a rating of 7. 2 participants gave a rating of 6. The three participants want prediabetic patients to be included in the guideline. The reason given is that prediabetes is a precursor to the development of full diabetes. 2 participants did not respond.
#4	Does any segment of the recommendation need more clarification? If needed, your suggestion on how to make the guideline unambiguous and specific will be welcomed.
Responses	5 participants gave a rating of 7. 1 participant gave a rating of 5. The participants are medical assistants and did not comprehend the medication regimen and the classifications of the diabetes medications as contained in the guideline. The participant requested clarification of the medication classification and administration. 2 participants did not respond.
#5	Does the guideline clearly present multiple options for diabetes management? Is there any evidence-based option you would like to include in the guideline?
Responses	3 participants gave a rating of 7. 3 participants gave a rating of 6. The participant wanted to include in the guideline food potions to eat, which high-calorie food to avoid, and whether it is advisable to skip a meal a day as a measure of weight loss. 2 participants did not respond.

(*table continues*)

Question	Details and Recommendations
#6	Are the key recommendations in the guideline easily identifiable to all the staff who would be using the guideline to treat and mentor patients? Which recommendations should be prioritized over others?
Responses	4 participants gave a rating of 7. 1 participant gave a rating of 6. The participants did not give a rationale for not scoring this section a perfect score of 7. 1 participant gave a rating of 5. The participant wanted to know at what glucose level the patients should be switched from oral medication to insulin injectable medication. 2 participants did not respond.
#7	Did the guideline contain instructions on how the treatment, mentoring, and monitoring of diabetes should be put into practice if approved by the clinic stakeholders? If not, what instructions would you like to be included?
Responses	4 participants gave a rating of 7. 2 participants gave a rating of 6. The participants expressed concern that the guideline did not include implementation techniques. 2 participants did not respond.
#8	Have the potential barriers such as tools, educational materials, and time been discussed? State how such barriers could be minimized.
Responses	5 participants gave a rating of 7. 1 participant gave a rating of 6. This participant indicated that not enough time is available to teach patients all the recommendations contained in the guideline. 1 participant gave a rating of 5. This participant stated that the clinic does not have enough personnel to implement the guideline. 2 participants did not respond.
#9	Did the guideline consider potential costs to patients and the clinic of applying the recommendations? If not, how could cost savings be incorporated into the guideline?
Responses	4 participants gave a rating of 7. 2 participants gave a rating of 6. The participants suggested that stores with the cheapest cost of supplies and equipment should be included in the guideline. 2 participants did not respond.

(*table continues*)

Question	Details and Recommendations
#10	Did the guideline incorporate concern for the health benefits, side effects, and risks for patients in following the guideline? If not, what are the implications for the patient's health?
Responses	6 Participants gave a rating of 7. There was no dissenting response. 2 participants did not respond.
#11	Were the views and preferences of the health care providers, allied health care workers, and stakeholders such as the medical director sought in the development of the guideline?
Responses	4 participants gave a rating of 7. These participants were aware of the development of the guideline and the process that was adopted. 1 participant gave a rating of 6. These participants wished that more staff should have been involved in the process of developing the guideline. 1 participant gave a rating of 5. The participant stated he was not aware of how staffs were consulted. 2 participants did not respond.
#12	Are there key review criteria for evaluating how the goals set in the guideline can be achieved? If not, what are the parameters you would like to use to monitor the success of diabetes control?
Responses	4 participants gave a rating of 7. 2 participants gave a rating of 6. The participants stated that the clinic should not be blamed if the key review criteria for evaluation of the success of the guideline if the patients are not compliant with the recommendations. The participants suggested that the key review criteria should be deleted from the guideline. 2 participants did not respond.
#13	Does the guideline provide for updating the recommendations to stay relevant and continuously improving diabetes treatment practice to improve patient outcomes? Send your suggestion if needed.
Responses	5 participants gave a rating of 7. 1 participant omitted this question. It may have been an error or oversight of the needed response. 2 participants did not respond.

(*table continues*)

Question	Details and Recommendations
#14	Are there conflicts of interest in the guideline for those who developed the guideline? How could such conflicts of interest be resolved?
Responses	6 participants gave a rating of 7. There were no dissenting participants. I believe that the participants knew that no conflict of interest exists in the guideline. 2 participants did not respond.
	Overall Guideline Assessment
A.	Rate the overall quality of this guideline. 1, 2, 3, 4, 5, 6, 7 Majority of the rating are 6 and 7
B.	I would recommend this guideline for use at the clinic.
Yes	Most participants would recommend the guideline
No	No negative response was received
Suggested Recommendations	Suggested recommendations are listed in the responses

Table 3

Follow-Up Group Questionnaire Responses

Question	Details and Recommendations
#1	Are the scope, purpose, and overall objective of the diabetes guideline clearly defined in the recommendation? If not, please provide details on how to improve the scope, purpose, and the objective of the recommendations on how to improve diabetes treatment and monitoring.
Responses	2 participants gave a rating of 7. 3 participants gave a rating of 6 but did not give any recommendation. 1 participant did not respond.
#2	Are the patients' health problems specifically described and addressed clearly and concisely regarding diabetes treatment and monitoring instructions? If the statements are confusing, please suggest how to amend each statement to make it better.

(*table continues*)

Question	Details and Recommendations
Responses	3 participants gave a rating of 7. 2 participants gave a rating of 6 but still suggested that diabetes readings and recording should be done on daily basis. 1 participant did not respond
Question #3	Did the guideline describe the target users and the population of patients, those with and without complications, whom the guideline is intended to address? Should prediabetic patients and high-risk patients be included in the guideline? Did the guideline describe the target users and the population of patients such as patients' diabetic patients with and without complications for whom the guideline is supposed to address? Should prediabetic patients and high-risk group patients be included in the guideline?
Responses	2 participants gave a rating of 7. 3 participants gave a rating of 6. The participants suggested that the scope of the guideline should be expanded to include prediabetic patients. 1 participant did not respond.
Question #4	Does any segment of the recommendation need more clarification? If needed, your suggestion on how to make the guideline unambiguous and specific will be welcomed. Does any segment of the recommendation need more clarification? If needed, your suggestion on how to make the guideline unambiguous and specific will be welcomed.
Responses	4 participants gave a rating of 7. 1 participant gave a rating of 5. The participant suggested that HgA1C needed an elaborate explanation of what it is for an educationally challenged patient to understand. 1 participant did not respond.
Question #5	Does the guideline clearly present multiple options for diabetes management? Is there any evidence-based option you would like to include in the guideline? Are various options for the management of diabetes contained in the guideline is clearly presented? Is there any evidence-based option you would like to include in the guideline?

(*table continues*)

Question	Details and Recommendations
Responses	4 participants gave a rating of 7. 1 participant gave a rating of 6. The participant requested the chart of the food pyramid to be included in the guideline. 1 participant did not respond.
Question #6	Are the key recommendations in the guideline easily identifiable to all the staff who would be using the guideline to treat and mentor patients? Which recommendations should be prioritized over others? Are the key recommendations in the guideline easily identifiable to all the staff that would be using the guideline to treat and mentor patients? Which recommendations should be prioritized over others?
Responses	4 participants gave a rating of 7. 1 participant gave a rating of 6. The participant wanted to know if a patient's glucose level remains below 130mg/dl and HgA1c above 6.0 should the patient start medication therapy. 1 participant did not respond.
#7	Did the guideline contain instructions on how the treatment, mentoring, and monitoring of diabetes should be put into practice if approved by the clinic stakeholders? If not, what instructions would you like to be included? Did the guideline contains instructions on how the treatment, mentoring and monitoring of diabetes be put into practice if approved by the clinic stakeholders? If not, what instructions would you like to be included?
Responses	2 participants gave a rating of 7. 2 participants gave a rating of 6. The participants expressed a desire for a robust mechanism to convince the stakeholders not to delay in adopting the recommendations. 1 participant gave a rating of 5. No explanation was given. Perhaps, the participant did not understand the concept of the question. 1 participant did not respond.
#8	Have the potential barriers such as tools, educational materials, and time been discussed? State how such barriers could be minimized.

(*table continues*)

Question	Details and Recommendations
Responses	2 participants gave a rating of 7. 3 participants gave a rating of 6 and suggested that all printed materials should be in Bilingual, which is English Language and Spanish language. 1 participant did not respond.
#9	Did the guideline took consideration of the patients and the clinic cost of applying the recommendations? If not, how could the cost savings be incorporated into the guideline?
Responses	4 participants gave a rating of 7. 1 participant gave a rating of 6. The participant suggested that patients who are unable to provide for their medical needs should be treated at zero cost in the clinic and be given pharmaceutical companies drug samples. 1 participant did not respond.
#10	Did the guideline incorporate concern for the health benefits, side effects, and risks for patients in following the guideline? If not, what are the implications for the patient's health?
Responses	2 Participants gave a rating of 7. 3 participants gave a rating of 6. The participants wanted to see the side effects of each medication listed in the guideline. 1 participant did not respond
#11	Were the views and preferences of the health care providers, allied health care workers, and stakeholders such as the medical director sought in the development of the guideline?
Responses	3 participants gave a rating of 7. 2 participants gave a rating of 6. These participants were not aware of the development of the guideline and the process that was adopted. They did not know that other primary health care providers (MD, PA, and NP) were involved in reviewing the guideline. 1 participant did not respond.
#12	Are there key review criteria for evaluating how the goals set in the guideline can be achieved? If not, what are the parameters you would like to use to monitor the success of diabetes control?

(*table continues*)

Question	Details and Recommendations
Responses	3 participants gave a rating of 7. 2 participants gave a rating of 6. The participants stated that the guideline did not address the monitoring and treatment of prediabetes, diabetes type 1, and gestational diabetes. 1 participant did not respond
#13	Does the guideline provide for updating the recommendations to stay relevant and continuously improving diabetes treatment practice to improve patient outcomes? Send your suggestion if needed.
Responses	2 participants gave a rating of 7. 3 participants gave a rating of 6. Without elaboration, the participant wants frequent research, studies, and discussions about diabetes and how to find a cure. 1 participant did not respond.
#14	Are there conflicts of interest in the guideline for those who developed the guideline? How could such conflicts of interest be resolved?
Responses	3 participants gave a rating of 7. 2 participants gave a rating of 6. The participants are aware that the clinic is not funding this study and that the focus of the study is about the patients' wellbeing. One participant wanted the names of the team members published and acknowledged in the guideline. 1 participant did not respond.
	Overall Guideline Assessment
A.	Rate the overall quality of this guideline. 1, 2, 3, 4, 5, 6, 7 Almost all the rating was 6 and 7
B.	I would recommend this guideline for use at the clinic.
Yes	All participants stated they will recommend the guideline to be adopted
No	There was no objection to adopting the recommendation
Suggested Recommendations	Suggested recommendations are contained in the participants' responses.

Data obtained from analyzing both the initial and follow-up groups' responses to the questionnaire were essentially positive. My goal was for the project team to rate the guideline as at least 90% effective. AGREE II does not recommend a cut-off

for the effectiveness of guidelines; the tool's authors stated that users can create their own thresholds but advocated that high-quality guidelines should have scores above 70% on each domain (AGREE II Consortium, 2017). Based on these scores, my proposed guideline is of high quality. The reviewers in both groups rated the guideline as meeting the criteria for implementation at the clinic and endorsed its adoption. Table 4 shows the questionnaire numbers, and Table 5 shows the domain scores as percentages.

Table 4

AGREE II Data Questionnaire Numbers

The Domain	Questionnaire Numbers	Corresponding Domain Item Numbers
Scope and Purpose	Questionnaire Number 1, 2, and 3	Item Number 1, 2, and 3.
Stakeholder Involvement	Questionnaire Number 7, 9 and 11	Item Number 4, 5, and 6.
Rigor of Development	Questionnaire Number 3, 4, 9, 10, 11,12, 13, and 14	Item Number 7, 8, 9, 10, 11, 12, 13, and 14.
Clarity of Presentation	Questionnaire Number 4, 5, and 6	Item Number 15, 16, and 17.
Application	Questionnaire Number 8, 9, 10 and 12	Item Number 18, 19, 20, and 21.
Editorial independence	Questionnaire Number 13 and 14	Item Number 22 and 23.
Overall Guideline Assessment	1 Questionnaire	Not Applicable
Recommend this Guideline for Use	1 Questionnaire	Not Applicable

Table 5 shows the percentage score from each domain to indicated how the AGREE II domain scores were calculated.

Table 5

Score on Each AGREE II Domain

The Domain	Score of the Domain
Scope and Purpose	91.11%
Stakeholder Involvement	92.22%
Rigor of Development	91.16%
Clarity of Presentation	95.55%
Application	92.50%
Editorial independence	91.67%
Overall Guideline Assessment	Positive
Recommend this Guideline for Use	100%

One unanticipated limitation in my analysis was that despite the enthusiasm of the clinic staff about the project, not all questionnaires were returned on time. Two participants in the initial group and one in the follow-up group did not return their questionnaires, and thus their data were excluded from my analysis. I faced strict time constraints that forced me to stop collecting data at a certain date, and data I could not incorporate might have changed the overall ratings. It is possible that staff members were complacent about completing their questionnaires or that they did not realize my time constraints or that missing data might affect my results. Staff members might also have felt actively or passively resistant to the idea of the guideline and thus been hesitant to participate.

The sample size of the project was small, and because some participants were excluded, the accuracy of my findings in terms of the project team's evaluation of the guideline might have been diminished. My analyses and conclusions might have been negatively affected by missing data from the diminished input of the excluded participants. Separately, I limited my guideline evaluators to clinic staff, whereas involving the broader group of stakeholders could stimulate the desire to implement the new guideline at the clinic.

The strength of the project is the thorough responses I did get from the six initial review group members who completed their questionnaires in time. Both the initial and the follow-up review groups comprised individuals who are professional health care staff and who have regular encounters with diabetes patients. The non-health care providers contributed knowledge from the layperson's point of view and gave suggestions on how to improve the wording and format of the diabetes self-management education curriculum and the design of the guideline. The initial group's responses assisted me in refining the guideline and contributed to the final version. I used the broader follow-up group's responses to appraise the guideline for quality and effectiveness.

The potential implications for positive social change from this project are that it will allow the clinic staff to provide efficient and effective diabetes treatment, reduce diabetes complications, and improve patients' health outcomes. Health care providers will be able to effectively control patients' serum glucose levels and HgA1C. The diabetes self-management education will also encourage patients to be proactive in their health care needs, empower them with skills needed to manage their

diabetes and decrease complications, and encourage patients to take ownership of their diabetes. The guideline will encourage the health care providers to be conscious of their diabetes treatment practices and concerned about the way they provide care to the patients. With the guideline, the providers will have guidance in teaching and monitoring clinic patients on the much-needed skills of diabetes management. Overall, the guideline will improve the treatment of diabetic patients at the clinic.

Recommendations

The rising prevalence of diabetes type II and the associated obesity pose a significant threat to the population of this clinic's community. In conjunction with genetic predisposition, economic and social factors act as substrates to enhance the likelihood of DM type II. Recommendations are aimed at the modifiable factors that contribute to diabetes onset among the patients at the practice site. Recommendations will be important for guiding the treatment of clinic patients with diabetes; the recommendations complement each other and are all important.

However, the first recommendation for any diabetes patient is weight control; there is compelling evidence that excessive carbohydrate intake has important influences on metabolic syndrome, obesity, and type 2 diabetes (Slyper, 2013). It is also well-known that diabetes type II is associated with obesity, and the factors that lead to obesity need to be addressed with each diabetes patient. Multiple approaches are needed to combat obesity, although the three most significant contributors are overconsumption of calories (especially carbohydrates), inactivity and sedentary lifestyles, and lack of exercise. Obesity is also linked to other diabetes complications such as cardiovascular diseases, hypertension, and hyperlipidemia.

Weight control has multiple effects on improving the health outcomes of diabetic patients; patients who lose weight often achieve improved serum glucose levels that could let them discontinue their diabetes medications, improved HgA1C, and decreased frequency of hyperglycemia. In the context of the guideline I developed for this study, the providers will discuss weight control measures for patients with body mass index above 25. Weight control measures include:

Dietary modifications. Patients should (a) decrease fat intake and decrease portion sizes; (b) use the plate method to guide food choices and portions through the day; (c) avoid fried foods or foods with excess saturated fat and cholesterol, (d) use less added fat, sugar, and salt; (e) use alcohol sparingly and only after discussing the effects with a care provider (this includes never drinking on an empty stomach because this can cause blood glucose to be too low); (f) drink adequate water or sugar-free beverages and avoid sugared drinks; (g) eat high-fiber foods such as vegetables, fruits, whole grains, and beans; and (h) try to distribute carbohydrate intake evenly throughout the day (Department of Veterans Affairs and Department of Defense, VA/DoD, 2017).

Exercise. Providers should discuss with the patients exercise regimens that include cardiovascular, weight-bearing, and aerobic exercise for 30 to 45 minutes at least three times a week; however, providers should caution patients not to exercise when their serum glucose is too high or too low to avoid a hypoglycemic episode. Brisk walking, flexibility, and kinesthetic exercises are alternatives to more vigorous exercises. In addition to weight control, other aspects of care are listed below.

Glucose monitoring and equipment calibration. Patients who are newly diagnosed with diabetes should be taught how to monitor their serum glucose with a glucometer at home. The ideal frequency for checking is before all meals, but the minimum frequency should be once a day before breakfast. Patients with long-term diabetes should receive periodic reinforcement of their self-care skills including being reminded to be proactive in their serum glucose monitoring. Patients should also be taught and encouraged to calibrate their glucometers to ensure accuracy in glucose measurement.

Recording serum glucose levels on a log sheet. All diabetes patients should receive one of the clinic's log sheets to record their serum glucose levels. The importance of recording the readings is that it provides the patients a visual means of tracking their glucose. Patients can identify trends and adjust their diets, exercise regimens, or medication regimens as needed. Patients should also bring their logs to each office visit for review with providers.

Medication therapy. The drug of first choice to treat all diabetes should be metformin, although metformin should not be initiated if a patient's eGFR is between 30 and 45, and it is contraindicated when eGFR is below 30. Depending on the patient's serum glucose level, the starting dose should be low, 500 mg daily; providers adjust the medication in accordance with the patient's serum glucose. When HgA1C is above 7.5% and premeal serum glucose levels are above 130 mg/dl after three months of monotherapy with metformin, dual therapy is necessary. Dual therapy should consist of metformin and a sulfonylurea such as Amaryl or Glucotrol (glipizide); alternatives to sulfonylureas are thiazolidinedione, DPP4, SGLT2, and

GLP-1 receptor agonist. Providers should initiate triple therapy after three months of dual therapy without any significant improvement in the patient's serum glucose or HgA1C. Triple therapy consists of metformin, the dual therapy medication, and insulin. Patients have the option of combination injectable insulin (long or short acting) with GLP-1 receptor agonist depending on their preference and their serum glucose data; short-acting insulin is added if the long-acting drug is not working. Providers can also begin insulin therapy with patients who have not maintained glycemic control even after months of double or triple oral hypoglycemic agents and with patients with FBS 250mg/dl, HgA1C above 10, or ketonuria (ADA, 2016).

Adjuvant medication therapy. Diabetes patients benefit from measures that protect other organ systems. A low dose of an ACE inhibitor such as lisinopril or an ARB such as losartan protects the kidneys from oxidative damage and provides renovascular protection. Low-dose statins such as simvastatin lower serum lipid levels and prevent atherosclerotic vascular disease in patients with diabetes and adding low-dose aspirin (81 mg daily) offers cardiovascular protection as long as there are no contraindications (ADA, 2016).

Collaboration. Patients' health status should be continuously evaluated. Providers should make referrals to allied health professionals and specialists when doing so is in the patient's best interest. Providers can make referrals to a diabetes counselor when, for instance, they are not able to teach patients the necessary self-care skills, and annual referrals to specialists may be warranted for patients with eGFR below 30 (CKD stage 3). Annual referrals to ophthalmologists are also necessary to evaluate patients for diabetic retinopathy and to administer early

treatment before it advances. Care providers should also examine patients' feet at the office and refer patients to a podiatrist if there are any foot abnormalities. Cardiologists should also be part of the referral team if a patient has any associated cardiac pathology.

Coping skills. Providers should evaluate patients' coping skills at every patient-provider encounter. For elderly patients with limited skills, providers should encourage family members or other trusted people to participate in patients' care with their consent. Providers should also encourage patients to participate in community support groups, although this should not be mandated. In the clinic vicinity, support groups are available at the local ADA chapter and other health care facilities.

Keeping follow-up appointments. Providers should ask patients if they face any barriers to coming to the clinic or otherwise participating in their care, such as transportation and affordability. Providers should explore available resources in the community that could offer patients the needed assistance, including giving patients medication coupons and samples.

Diabetes self-management education. The key to patients' managing their diabetes is educating them frequently on self-management skills; even when patients know the skills, it is beneficial to reinforce them, particularly when new evidence or materials are available. Mentoring and teaching are the foundations of effective diabetes self-management. As noted above, providers should encourage patients to monitor their own serum glucose and HgA1C values and ensure that they are aware of the values and ranges that are considered controlled versus uncontrolled.

Patients also need to know about medication side effects such as hypoglycemia. They should be taught to eat immediately when they start to feel the signs of hypoglycemia such as excessive sweating, fainting sensation, and trembling. Providers should also advise patients to eat when their serum glucose is less than 60mg/dl and to call their primary care providers if serum glucose is more than 250 mg/dl. Diabetic ketoacidosis rarely develops when FBS is less than 250 mg/dl (VA/DoD, 2017). Patients should also seek medical treatment if they are feeling the signs of hyperglycemia such as excessive thirst, frequent urination, and malaise.

In addition to side effects specifically, patients should know when to take their diabetes medications. For example, sulfonylureas are better absorbed on an empty stomach and should be taken 30 minutes before meals, whereas short-acting insulin should be administered at the time of meal consumption to avoid hypoglycemia. Patients should receive guidance on insulin administration and injection sites, including knowing to rotate injection sites to avoid scar tissue formation that could decrease insulin absorption. Patients should know how to examine themselves and be aware that they should report any wounds especially to the lower extremities; lower limb amputation is a frequent complication of diabetes.

Involve patients in all aspects of their care. Involving patients in their care ensures compliance and encourages patients to take ownership of their disease and be proactive in meeting their health care needs. Displaying information visually such as with charts, graphs, and posters solidifies patients' knowledge and reinforces their involvement in their care. Providers should request feedback and ask patients to demonstrate their skills to ensure effective treatment, and it is also important to

address patients' emotional needs and provide support and encouragement for their involvement in their diabetes care.

Providers should also avoid confusing medical jargon and instead use simple, understandable language. For instance, patients may not understand what HgA1C stands for or recognize what levels are too high. Providers could, for example, tell a patient that her three-month blood sugar values are above the control of 6.4 rather than just telling her that her HgA1C is 7.0.

Use translators to communicate with patients when necessary. For patients who are not fluent in English, providers should attempt to communicate the guideline in the patient's primary language. Providers should not hesitate to use interpreters to communicate effectively with patients. Although this should be avoided, if there is no interpreter, Google Translate and similar applications are available.

Cost control measures. Providers and allied health staff should recommend to patients that they buy supplies such as alcohol pads, glucometers, strips, and lancets at stores that offer low prices and/or discounts; patients should also receive samples from the clinic when they are available. Staff can also help low-income patients by helping them enroll in subsidy programs. Additionally, if patients cannot afford HgA1C monitoring every three months, they could monitor every six months.

Establish control parameters. Patients with HgA1c above 6.5 and/or FBS above 126 mg/dl should be considered diabetic, although HgA1C between 6.5 to 7.0 is considered controlled diabetes. Providers should initiate medication therapy for HgA1C above 7.0, which indicates uncontrolled diabetes. Patients with lifetime expectancy of 5 to 10 years of HgA1C ranging from 7.0 to 8.0 and patients with

expectancy of less than 5 years of HgA1C from 8.0 to 9.0 could be used establish controlled parameter (VA/DoD, 2017).

Updating the guideline. The guideline I developed for this project will be reviewed periodically and is subject to change. Changes will be made in accordance with new credible, evidence-based findings from experts such as the ADA and the American Association of Clinical Endocrinologists.

Proposed Secondary Products

I propose a food pyramid chart (Appendix C) to supplement the primary diabetes care guideline. The chart will help patients with measuring appropriate portions of the correct foods and choices of food combinations. I also propose a picture of insulin injection sites (Appendix D) because many patients may not know the appropriate sites. Providers should also teach patients how to administer insulin and also to rotate their injection sites. A visual aid (Appendix E) will be educational and will reinforce the verbal instructions patients receive. It is also important to ensure that patients understand the pathophysiology of the pancreas and the etiology of diabetes mellitus, also with a visual representation of the pancreas (Appendix F).

Recommended Implementation and Evaluation Procedures

The diabetes guideline will need a system of implementation and evaluation at the practice site; the best way to implement the guideline is to educate the clinic staff members, beginning with an in-house seminar with the staff about the content of the guideline, what it is intended to achieve, and its expected impact on the patients' health. The second step is to conduct simulation tests to supervise different staff members' hands-on training with the diabetes patients such as teaching self-

management skills. Implementation is usually challenging when new practice standards are introduced.

The recommended implementation will be to train the practice site medical assistants on mentoring on how to conduct glucometer quality control checks and how to record their glucose levels in the log book, as well as to cordially remind patients about the frequency of diabetes home monitoring. The clinic's health care providers should be responsible for the bulk of the implementation. I will recommend that the providers assess patients' diabetes knowledge and correct any misinformation. Patient education is the key to successful implementation of the diabetes guideline.

I will also recommend that the clinic providers follow the evidence-based medication regimen that I discussed in the recommendations section earlier in this study and that I will include in the diabetes guideline. Providers should also review patients' medication administration along with covering adverse effects; medication review will let the providers know if patients are compliant with the medication regimen. Also, as part of the guideline's implementation, providers should emphasize physical exercise and dietary modification equally, including providing patients with the locations of community recreation centers and encouraging them to exercise regularly, at least three times per week. Providers should also administer preventive health check-ups such as annual eye examinations, podiatry care, and diabetes education, along with making timely referrals to specialists such as nephrologists, cardiologists, wound care specialists, neurologists, and ophthalmologists at any indication of early diabetes complications.

Evaluation. Evaluating the guideline will require determining the impact of the project. Evaluation will entail collecting patient feedback about the program along with specialists' reports, checking patients' glucose logs, and assessing their serum glucose and HgA1C levels; one way to evaluate the effectiveness of the diabetes guideline will be is to monitor patients' HgA1c every three months and compare the values over time. Frequent health assessment (twice annually) will enable the clinic providers to evaluate patients' health and collect data.

Separately, patients should receive satisfaction surveys every year or two years to rate their experiences and treatments at the clinic practice site. The guideline will be considered effective if most of the patients show recommended HgA1c values of 5.8 to below 7.0 and maintain fasting serum glucose between 60 mg/dl to 126 mg/dl, if fewer patients develop diabetes complications, and if most patients' surveys indicate significant improvement in their health status.

Individual staff performance should be evaluated to determine if the clinic staff personnel are meeting the implementation targets such as controlled serum glucose and HgA1c levels. There should be monthly peer reviews to ascertain if the staff are complying with the established diabetes treatment criteria. Staff members should also evaluate the guideline itself periodically to determine if updates are needed; among other areas, any evaluations of the diabetes guideline I have developed should include incorporating any new evidence-based findings regarding diabetes treatment. The primary goal of the evaluation is to inform the practice site stakeholders on the effectiveness of the diabetes guideline.

Contributions of the Project Team

The project team consists of the team leader, a nurse educator, an office administrator, a secretary, an information technologist, one health care medical assistant, a nurse practitioner, and the medical director. The team's work on the project to refine the diabetes guideline I developed was dynamic. The team met on Mondays, Wednesdays, and Fridays shortly after the last patients had left. As the team leader, I prepared the agendas and introduced the progress. Each member deliberated on the agenda and contributed his or her expert opinion to resolve any oversight issues.

The two teams held detailed discussions on the questionnaires, including their feedback and suggested amendments; members deliberated on the proposed changes to the diabetes practice guideline recommendations based on supportive evidence such as research, studies, and expert opinion. Among the issues that came up during deliberations were the following:

- Which recommendations would take priority?
- Would the clinic staff have sufficient time to teach patients the basic diabetes management skills?
- How often should HgA1c be ordered? What is the ideal frequency of patients' follow-up visits?
- What would be the costs to the patients and the clinic if the clinic adopted the diabetes self-management education guideline?

The team resolved by joint decision-making that the providers should prioritize lifestyle changes, diet modification, and educating patients on basic self-

management skills. Every effort should be made to refer patients to diabetes educators when the clinic providers do not have the time to teach patients what they need to know. Another resolution the team reached was to measure HgA1c every three months for patients with uncontrolled diabetes and every six months for patients with controlled serum glucose and HgA1c levels. Follow-up care should be scheduled for two to three weeks after laboratory tests are taken and every time a medication changes. Health care needs should be individualized, particular for self-pay patients in order to decrease health care costs. Meanwhile, the clinic's costs of implementing the diabetes treatment guideline will be offset by improved treatment practice and patient health outcomes.

Team Members' Responsibilities

I as the team leader organized the project, communicated the project objectives, and designed the project. Specifically, I developed the diabetes guideline, the recommendations, and the questionnaire. I presented the recommendations to the team members and reviewed the responses and the feedback. The nurse educator emphasized the crucial role of educators in teaching and mentoring patients as well as serving as resources for both the patients and the health care providers. The nurse educator reviewed the diabetes guideline and ensured that the guideline contained an adequate teaching component. The office administrator scheduled all the team members' meetings, typed the guideline and all memos, and helped arrange the sequence of information. The IT specialist made computers and other electronic media available for the team members, the medical assistant recommended that patients' serum glucose levels be checked at every office visit, and the health care

provider contributed to the medication administration regimen, ordered laboratory tests, and determined the frequency of follow-up care. The medical director did not participate often due to his busy schedule, but when he did, he expressed support for the project and validated the importance of the diabetes treatment guideline.

Developing Final Recommendations

Initial group. The project team members reviewed the responses from the 8-member initial guideline review group. I distributed eight questionnaires to evaluate the diabetes guideline, but two of the members did not return theirs; the physician indicated that he mailed had the questionnaire but then took an impromptu leave of absence to visit his ailing mother out of state, and one of the medical assistants said the content of the questionnaire was too complex. A total of six responses were received from the initial group.

The questionnaire allowed respondents write in their responses in addition to responding yes or no to some items. I collected the data over 14 days, and I gave each group member my residence address, phone numbers, and email addresses in case there were any questions or concerns. The team made one minor revision to the guideline based on feedback before I sent the revised guideline to the follow-up group.

Follow-up group. Five of the six follow-up review group team members reviewed the revised questionnaire. As with the initial group, this group had several methods to contact the project team members with questions and concerns. I collected the data from the five respondents during this round of guideline development over 10 days; I conducted the total data collection over three weeks from both groups.

Project team. The project team members reviewed the responses from both the initial and follow-up groups and considered the concerns of both. The project team used the AGREE II instrument to score the overall quality of the developed diabetes treatment guideline. The project team reviewed the revised guideline over five days, and the medical director reviewed and approved the recommendations. The project team as a whole worked collaboratively, addressed concerns, reviewed responses, and made revisions in order to ensure a high-quality guideline.

Plans to Extend the Project

A study that is not disseminated does not serve a useful purpose. Disseminating my project will increase the awareness and the benefits of having a diabetes treatment guideline at the clinic. It is accepted within health care that clinicians and managers should base their practice and decision-making on evidence (Neta et al., 2015). Because this is an evidence-based DNP project, the next step in extending the project beyond the doctoral level is to convince the clinic leaders to adopt this guideline. If I communicate the initiatives in the diabetes management guideline to the clinic stakeholders, it is possible that there will be less resistance to adopting the guideline. Addressing the internal and external challenges that could impede guideline implementation at the project site may alleviate stakeholder concerns about the project. Staff members at the practice site participated in different groups for the DNP project; hence, these staff members may play a crucial role in the project's implementation if the administrators decide to adopt the guideline. Once the clinic leaders successfully implement this diabetes treatment guideline, extending the

project further will entail disseminating the project findings to the surrounding clinics in the community that do not have an evidence-based diabetes guideline.

Strengths and Limitations of the Project

Strengths

There were no conflicts of interest; the clinic did not sponsor or finance the project and did not influence the project outcome. There were no financial transactions or gifts for the project team members and the clinic staff. Additionally, the staff members who assisted with the project were volunteers, and the evaluators acted professionally without bias. Site staff participated fully in the project and acted independently from any external influences. The project team utilized evidence-based recommendations from accredited organizations such as the ADA and the American Academy of Nutrition and Dietetics, and we also extracted some of the recommendations from the VA/DoD clinical practice DM guideline.

I used two separate groups to assess the validity of the recommended guideline; group members were health care providers and end users who will be implementing the guideline if the administrators adopt it. The AGREE II instrument provided a framework for assessing the quality of the guideline and its development and for evaluating the guideline's internal and external validity.

The responses from both review groups closely mirrored each other. When the two groups gave similar ratings, I could deduce that the content of the recommended guideline was valid, standardized, and substantive; the guideline is simple to understand, user-friendly, and evidence based. The members of the two review

groups rated the guideline highly on all AGREED II domains, thus giving credence to the project and the guideline's professionalism.

Recommendations for future projects that address similar topics using similar methods will be to replicate the project in a clinic with similar patient demographics; for instance, there may be clinics in the community that do not have diabetes practice guidelines. Every clinic is unique, and thus, if researchers at other clinics achieve similar results, then patient outcomes may spread throughout larger communities community. I recommend that researchers identify clinics with high numbers of diabetes patients, assess the clinics' diabetes treatment practices and their effectiveness, and develop effective diabetes treatment guidelines if the practice site guideline is deficient or not evidence-based.

Limitations

Certain assumptions were made without regard to staff comprehension of the recommendations in the developed guideline. Many clarifications and explanations were given to the medical assistants who participated in the guideline review groups; the issue was not reading English but understanding the content of the guideline. I did write the guideline in basic English, and the assistants' difficulties with the content raised the issue of whether the patients who are intended to be the end users will be able to comprehend the guideline, particularly given that some patients may have limited proficiency of even basic English.

The small sample size was also a limitation that might have affected the quality of this office; I had to exclude three participants because they did not return their questionnaires within the allotted period. Participant attrition can threaten the

internal validity of studies, potentially altering the data sufficiently to render the project invalid. Attrition is one of the major methodological problems in any study; it can deteriorate generalizability of findings if the participants who remain are significantly different from those who drop out (Gustavon, von Soest, Karevold, & Roysamb, 2012). Eleven participants evaluated the guideline that I developed for this project, and the opinions of small participant samples may not reflect those of broader populations.

I created a guideline for a diabetes self-management education regimen for a clinic located in a low-income neighborhood in an urban area of a city in Texas. The guideline may not be generalized to larger segments of the community or to other clinics because of the patient demographics at the project clinic, the small sample size for evaluating the guideline, and different staff characteristics at different clinics. As a final potential limitation, the stakeholders may not have the zeal to engage in further evaluation and implementation of the recommendations.

Summary

The clinic for this DNP project needs a diabetes treatment guideline to standardize the treatments being given to patients, and with this project, I aimed to develop such a guideline for the clinic. The social implication of instituting this diabetes treatment guideline is using evidence-based care and practices based on guidelines from accredited organizations to reduce diabetes complications, teach patients diabetes self-management skills, and empower patients to take ownership of their health care needs.

Section 5: Dissemination Plan

Disseminating this project is important for giving this and other clinics potential insights into managing diabetes for patients. The main purpose of dissemination will be to share ideas with the clinic staff members, raise their awareness, improve the existing diabetes management practices at the clinic, and implement the findings. The dissemination will include stressing the importance of having a standardized diabetes practice guideline rather than the clinic's current approach of each provider's choosing his or her own diabetes management practices, which often are not based on evidence. The dissemination will highlight the importance of preventing diabetes complications, implementing diabetes self-management education, and following the recommendations from the study. Sharing ideas also prevents redundant efforts through effective communication (Elium Team, 2016). One of the most consistent findings from clinical and health services projects is the failure to translate findings into practice and policy. Because of failure to implement findings in policy, patients are unable to benefit from advances in health care (Grimshaw, Eccles, Lavis, Hill, & Squires, 2012). Disseminating the findings will be an essential role for me as the DNP scholar-practitioner. Mentoring other health workers through the dissemination of findings establishes me as a leader in the nursing profession. According to the AACN (2006), DNP students should disseminate findings from evidence-based practice and research to improve health care outcomes.

To disseminate the findings of my project, I will use various methods. My plan is to use visual aids to complement the verbal presentation. The visual

presentation will include charts, posters, graphs, data, samples of the questionnaires, and publications that supported the study findings. The advantage of using a combination of verbal and visual means to disseminate the findings is that the audience will be able to associate the visual images with the verbal content. Visual images complement verbal presentations and add information to them. The advantage of a visual presentation is that they tend to be persuasive and convincing to the audience and visualization provides a powerful means of making sense of data (University of Minnesota, 2015). Disseminating these project findings may lead the clinic to adopt the diabetes guideline to decrease complications among patients, improve health outcomes, and improve the clinic's efficiency at treating diabetes patients.

The audience will be mostly practice site staff and stakeholders. Staff members will include the medical director, who is also the proprietor of the clinic; I will ask each staff member to attend the seminar that will be held at the practice site conference hall. The end users of diabetes guidelines, the health care providers and clinic administrators, will be invited to attend; with the permission of the medical director, I will invite members of the community as well. I may conduct an area survey of other clinics in the community that do not have a diabetes practice guideline or clinics with guidelines that are outdated or not based on evidence. To disseminate the project to the broader nursing profession, I intend to attend seminars, conferences, and symposia as a guest speaker. Publication of the project findings in local and national journals and magazines will be a viable option to reach wider audiences. My target audience includes diabetes patients, students, teachers, professors, clinic

stakeholders, health care managers, health care administrators, and members of professional organizations such as the ADA.

Analysis of Self

As a practitioner, I have a responsibility to advance the practice of nursing, provide the possible best treatment to patients, and improve patients' health. Patient care must be based on evidence-based treatment guidelines, educating patients on health maintenance skills, and empowering patients to assume ownership of their disease. My action is geared toward promoting strategies to address patients' health care needs. The nursing profession involves developing and promoting new approaches to nursing practice. My development of the diabetes practice guideline was inspired by the desire to meet current and future needs of diabetes patients who attend the practice site for medical treatment, to contribute to population safety, and to design evidence-based interventions.

An attribute of clinical scholarship is the use of analytical methods to assess an existing practice for efficiency, to determine the need to develop an evidence-based practice, to evaluate outcomes within a practice setting, and to disseminate findings from studies to improve health care outcomes. After observing a deficiency at the practice site, I employed my scholarly skills to find a solution to improve health outcomes for diabetes patients who attend the practice site. My scholarship motivates me to function collaboratively with other allied health professionals in the knowledge dissemination. I intend to continue applying relevant findings for the purposes of improving nursing practice and patients' health outcomes.

I functioned adequately as the project manager. My managerial skills helped me coordinate staff activities and plan project events. As a project manager, I held each staff member accountable for completing his or her section of the project. Staff members were commended and rewarded with praise for accomplishing tasks. I employed my project managerial and leadership skills with the interprofessional team to create a health care guideline that, if adopted and implemented at the practice site, may enhance the quality of life of diabetes patients by preventing or delaying diabetes complications.

A nurse practitioner's scholarly and managerial roles are interconnected. The skills learned from the current project of developing a practice guideline will have a positive impact on planning long-term health care policies. My experience with the current project will lead to a more comprehensive assessment of health issues in a complex health care institution. I will apply diverse methodologies to implement health care policies based on my current experience in developing a diabetes practice guideline.

One challenge I faced during the project development was delays in the meetings to review the guideline; meeting at the scheduled time was challenging because staff members were tired at the end of the day and not always able to focus on the task. The other challenge was that I did not receive all questionnaires in the allotted time, and I had to exclude these respondents' views from the data analysis.

Insights gained during and at the completion of the project were enriching. Most of the practice staff responded positively to the guideline. Any changes in policy often attract opposition, and two of the nursing assistants and a physician

assistant resented the diabetes practice guideline. However, they were not opposed to the guideline because the patients would not benefit from the practice changes but because the changes would lead to more work including more paperwork and because it would take more time to educate the patients on diabetes self-management skills; the staff members feel that they are already overwhelmed with the current workload. I am confident that all clinic staff will come to support and implement the new guideline when the clinic stakeholders decide to adopt it.

Summary

This doctoral project was aimed at developing a diabetes practice guideline for a clinic that that does not have one. The goal of the guideline is to decrease diabetes complications, improve patients' health outcomes, and educate the patients about the skills needed for diabetes self-management. The secondary goal is to improve diabetes management practice at the clinic. Dissemination of the study outcome is an important part of the project. Without dissemination, the project outcome may remain unknown and the knowledge gained will never be shared. Verbal dissemination of the study outcomes will be enhanced with visual aids. Hindrances encountered during the project were surmountable, and all team members participated actively. I remain optimistic that the diabetes practice guideline I developed for this DNP project will be adopted and implemented by the practice site.

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Appendix A: AGREE II Data Domain Calculation

Domain 1. Scope and purpose

Appraiser	Item 1	Item 2	Item 3	Total
MD	6	7	7	20
PA	7	6	6	19
NP	6	6	7	19
DM				
Counselor	6	7	6	19
MA	7	7	6	20
Total	32	33	32	97

Maximum possible score = 7 (strongly agree) × 3 (items) × 5 (appraisers) = 105
Minimum possible score = 1 (strongly disagree) × 3 (items) × 5 (appraisers) = 15
The scaled domain score will be:

$$\frac{Obtained\ score - Minimum\ possible\ score}{Maximum\ possible\ score - Minimum\ possible\ score} \times 100$$

$$\frac{97-15}{105-15} \times 100 = \frac{82}{90} \times 100 = .9111 \times 100 = 91.11\%$$

Domain 2. Stakeholder involvement

Appraiser	Item 4	Item 5	Item 6	Total
MD	6	7	6	19
PA	7	7	7	21
NP	7	7	6	20
DM				
Counselor	6	7	7	20
MA	5	6	7	18
Total	31	34	33	98

Maximum possible score = 7 (strongly agree) × 3 (items) × 5 (appraisers) = 105
Minimum possible score = 1 (strongly disagree) × 3 (items) × 5 (appraisers) = 15
The scaled domain score will be:

$$\frac{Obtained\ score - Minimum\ possible\ score}{Maximum\ possible\ score - Minimum\ possible\ score} \times 100$$

$$\frac{98-15}{105-15} \times 100 = \frac{83}{90} \times 100 = .9222 \times 100 = 92.22\%$$

Domain 3. Rigor of development

Appraiser	Item 7	Item 8	Item 9	Item 10	Item 11	Item 12	Item 13	Item 14	Total
MD	6	6	7	7	6	7	6	7	52
PA	7	7	7	6	7	6	7	6	53
NP	7	6	7	6	6	7	7	7	53
DM Counselor	6	7	7	7	7	6	6	6	52
MA	5	6	6	6	7	7	6	7	50
Total	31	32	34	32	33	33	32	33	260

Maximum possible score = 7 (strongly agree) × 8 (items) × 5 (appraisers) = 280
Minimum possible score = 1 (strongly disagree) × 8 (items) × 5 (appraisers) = 40
The scaled domain score will be:

$$\frac{Obtained\ score - Minimum\ possible\ score}{Maximum\ possible\ score - Minimum\ possible\ score} \times 100$$

$$\frac{260-40}{280-40} \times 100 = \frac{220}{240} \times 100 = .91666 \times 100 = 91.16\%$$

Domain 4. Clarity of presentation

Appraiser	Item 15	Item 16	Item 17	Total
MD	5	7	6	18
PA	7	7	7	21
NP	7	6	7	20
DM Counselor	7	7	7	21
MA	7	7	7	21
Total	33	34	34	101

Maximum possible score = 7 (strongly agree) × 3 (items) × 5 (appraisers) = 105
Minimum possible score = 1 (strongly disagree) × 3 (items) × 5 (appraisers) = 15
The scaled domain score will be:

$$\frac{Obtained\ score - Minimum\ possible\ score}{Maximum\ possible\ score - Minimum\ possible\ score} \times 100$$

$$\frac{101-15}{105-15} \times 100 = \frac{86}{90} \times 100 = .95555 \times 100 = 95.55\%$$

Domain 5. Application

Appraiser	Item 18	Item 19	Item 20	Item 21	Total
MD	6	7	7	6	26
PA	7	7	6	7	27
NP	6	7	6	6	25
DM Counselor	7	7	7	7	28
MA	6	6	6	7	25
Total	32	34	32	33	131

Maximum possible score = 7 (strongly agree) x 4 (items) x 5 (appraisers) = 140
Minimum possible score = 1 (strongly disagree) x 4 (items) x 5 (appraisers) = 20
The scaled domain score will be:

$$\frac{Obtained\ score - Minimum\ possible\ score}{Maximum\ possible\ score - Minimum\ possible\ score} \times 100$$

$$\frac{131-20}{140-20} \times 100 = \frac{111}{120} \times 100 = .9250 \times 100 = 92.50\%$$

Domain 6. Editorial independence

Appraiser	Item 22	Item 23	Total
MD	6	7	13
PA	7	6	13
NP	7	7	14
DM Counselor	6	6	12
MA	6	7	13
Total	32	33	65

Maximum possible score = 7 (strongly agree) x 2 (items) x 5 (appraisers) = 70
Minimum possible score = 1 (strongly disagree) x 2 (items) x 5 (appraisers) = 10
The scaled domain score will be:

$$\frac{Obtained\ score - Minimum\ possible\ score}{Maximum\ possible\ score - Minimum\ possible\ score} \times 100$$

$$\frac{65-10}{70-10} \times 100 = \frac{55}{60} \times 100 = .9166 \times 100 = 91.67\%$$

Appendix B: AGREE II Score Sheet

Domain		Item	AGREE II Rating 1 *Strongly Disagree*	2	3	4	5	6	7 *Strongly Agree*
Scope and purpose	1.	The overall objective(s) of the guideline is (are) specifically described.							
	2.	The health question(s) covered by the guideline is (are) specifically described.							
	3.	The population (patients, public, etc.) to whom the guideline is meant to apply is specifically described.							
Stakeholder involvement	4.	The guideline development group includes individuals from all the relevant professional groups.							
	5.	The views and preferences of the target population (patients, public, etc.) have been sought.							
	6.	The target users of the guideline are clearly defined.							
Rigor of development	7.	Systematic methods were used to search for evidence.							
	8.	The criteria for selecting the evidence are clearly described.							
	9.	The strengths and limitations of the body of evidence are clearly described.							
	10.	The methods for formulating the recommendations are clearly described.							
	11.	The health benefits, side effects and risks have been considered in formulating the recommendations.							
	12.	There is an explicit link between the recommendations and the supporting evidence.							

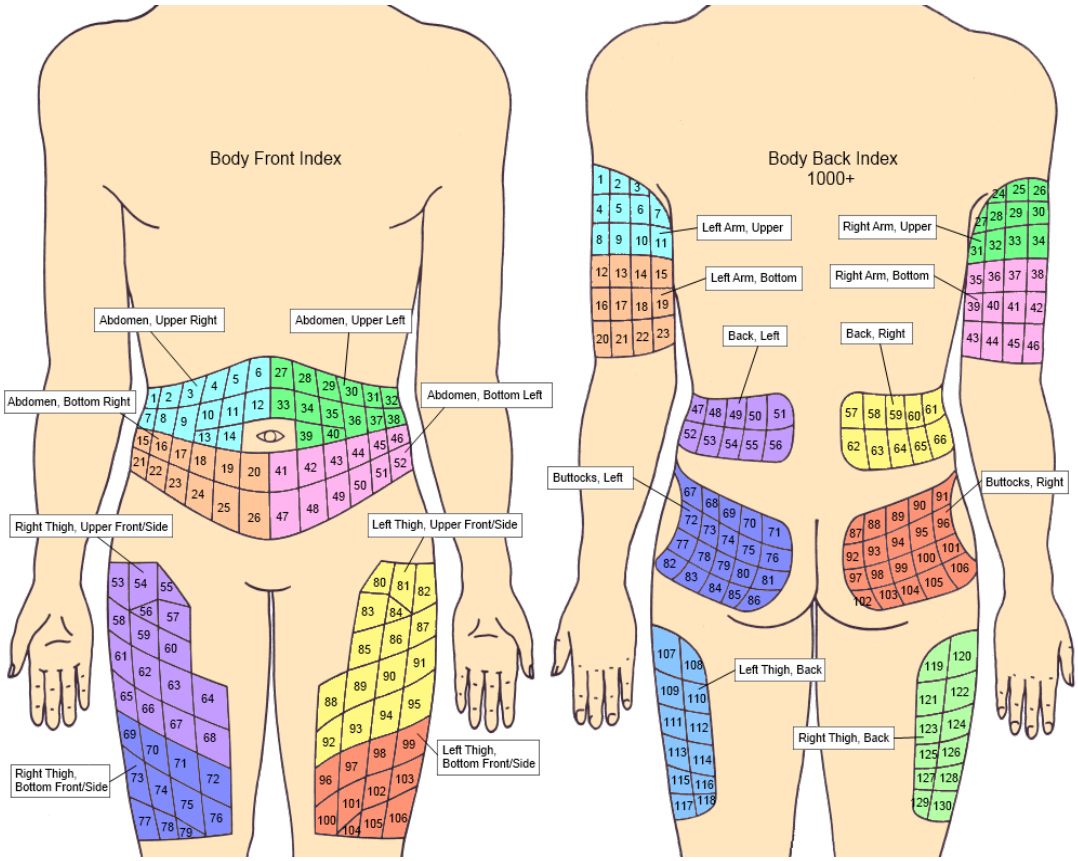
(*table continues*)

Domain	Item	1 *Strongly Disagree*	2	3	4	5	6	7 *Strongly Agree*
	13. The guideline has been externally reviewed by experts prior to its publication.							
	14. A procedure for updating the guideline is provided.							
Clarity of presentation	15. The recommendations are specific and unambiguous.							
	16. The different options for management of the condition or health issue are clearly presented.							
	17. Key recommendations are easily identifiable.							
Applicability	18. The guideline describes facilitators and barriers to its application.							
	19. The guideline provides advice and/or tools on how the recommendations can be put into practice.							
	20. The potential resource implications of applying the recommendations have been considered.							
	21. The guideline presents monitoring and/ or auditing criteria.							
Editorial independence	22. The views of the funding body have not influenced the content of the guideline.							
	23. Competing interests of guideline development group members have been recorded and addressed.							
Overall Guideline Assessment	1. Rate the overall quality of this guideline.	**1** *Lowest possible quality*	**2**	**3**	**4**	**5**	**6**	**7** *Highest possible quality*
	2. I would recommend this guideline for use.	*Yes*		*Yes, with modifications*				*No*

Appendix C: Food Pyramid

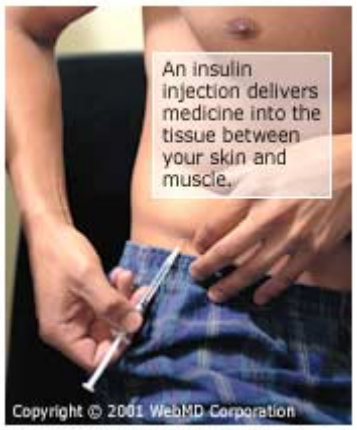
http://viralrang.com/wp-content/uploads/2016/11/Food-Pyramid.jpg

Appendix D: Insulin Injection Sites



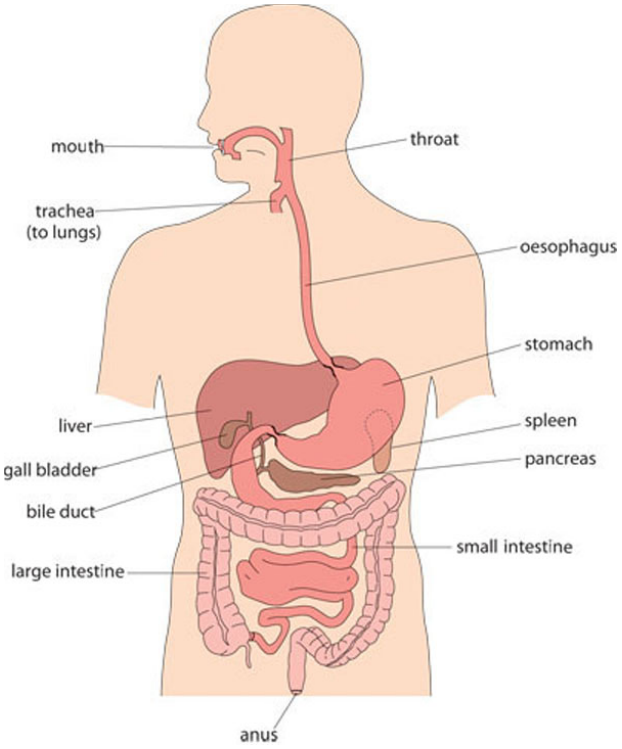
http://guide.diabetes-m.com/miscellaneous/injection-sites-index

Appendix E: How to Administer Insulin Injection



https://www.webmd.com/diabetes/give-yourself-insulin-shot#1

Appendix F: Pancreas Chart



http://www.open.edu/openlearncreate/mod/oucontent/view.php?id=288&extra=thumbnail_idp2917120