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Staff Education on Type 2 Diabetes Mellitus

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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,
and that any and all revisions required by
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Walden University
2020

Abstract

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MSN, Walden University, 2016

BSN, Excelsior College, 2012

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 major health concern that affects the physical and financial facets of communities. During the past 4 years, a multidisciplinary health care clinic in a northern state reported an increase in the number of type 2 diabetes (T2D) patients. Forty-three percent (43%) of adults with T2D had an elevated glycated hemoglobin A_{1c} of 7.5% or higher. Yet, the staff at the clinic lacked current knowledge of T2D, quality of care, and prevention strategies for patients with T2D. This resulted in increased serious health care issues, associated costs, and increased complications of the patients with T2D. The purpose of this project was to develop an education program guided by Orem's self-care model, Bandura's self-efficacy theory, and Knowles's adult learning theory to determine whether an education program on T2D would increase staff's knowledge of T2D. After a review of the literature an evidence-based education program was developed that covered the current standards of care for T2D. A standardized knowledge test was administered to 9 staff followed by the education program. A posttest was then administered to the same 9 staff to determine if knowledge increased. A paired samples *t*-test was used to determine if post scores had increased compared to the pretest scores and showed a significant improvement (M =1.22, p = .047). Positive social change may result when staff are knowledgeable of T2D care and management and can offer informed support to patients and family and in so doing enable patients to lead healthier lifestyles.

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Dedication

I am grateful to almighty God who granted me the knowledge, wisdom, understanding, and for guiding me throughout this program. In memory to my parents Hezekiah and Carmen Williams especially my mother who instilled in me the beauty of learning and education, and to my dear sister Jennifer (gone too soon), I know you would have been proud of me.

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To all my family members, brothers, sisters, nieces, nephews, and in-laws, who never gave up on me but believed and had faith that what I had started I will accomplish till the end. I appreciate and thank you for your love, support, inspiration and encouraging words. To all my friends who encouraged and cheered me on, I thank you.

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Section 1: Nature of the Project

Introduction

The prevalence of diabetes mellitus (DM) is growing significantly and constitutes a major health concern. It affects more than 20 million Americans and is one of the major causes of disease morbidity and mortality in the United States (Carpenter et al., 2017). There were 3.7 million deaths in the United States in 2012, of which 1.5 million were due to diabetes, and 2.2 million were from the comorbidities of diabetes leading to heart diseases, stroke, kidney disease, blindness, and nerve damage (Asif, 2014). According to Bahia et al. (2011), the annual cost of DM averages $2,108 per patient and was nearly twice that of patients without diabetes. Managing diabetes by educating patients places emphasis on the individual and is vital to curb the extent of the disease.

The International Diabetes Federation (IDF) estimated that the growing rates of diabetes is of considerable economic burden both for the patient and the health care system (L'Heveder & Nolan, 2013). It is significant both in terms of the direct costs of medical care, as well as indirect costs of reduced productivity linked to diabetes-related morbidity and mortality (American Diabetes Association [ADA], 2009). Diabetes is becoming increasingly prevalent, and the escalation is triggering increased economic burdens (Rowley, Bezold, Arikan, Byrne, & Krohe, 2017). Without a profound change in public or a private plan of action, this cost growth is expected to add a significant strain to an already overburdened health care system (Huang, Basu, O'Grady, & Capretta 2009).

The gap in practice in this doctoral project was the lack of adequate knowledge by staff on Type 2 diabetes (T2D), time constraints when engaging with patients, and the inability to provide the day-to-day support for patient with diabetes to allow for self-management. Being knowledgeable about diabetes would promote evidence-based strategies and provide better care outcome to patients. Developing an education program for staff introduced a level of currency in evidence-based experience and augmented staff knowledge on standardized self-management education.

In this doctoral project, I supported Walden University's mission for positive social change. Staff at the clinic were educated on effective ways and skills to use the application of evidence-based practice in caring for the patients with diabetes. In so doing, providers established awareness on effective measures on how to self-manage diabetes at the out-patient settings, community hospital, the nursing homes, and the community through standardized guidelines by the application of best practices. The benefits of using evidence-based practice at the clinic where I conducted the project was that it supported unique and effective care and, although it may be challenging, may improve patient care outcomes which, in turn, will decrease patient care costs (Spruce, 2015).

Problem Statement

My focus in this doctoral project was to develop an education program for staff on T2D. The clinic staff identified that self-care management of diabetes was a struggle for patients and noncompliance ranked high among patients with diabetes. Of the 350 adult patients in the clinic, 43% were diagnosed with T2D, which meant that they had an

elevated glycated hemoglobin A_{1c} of 7.5% to 8.0% or higher. These numbers were high despite staff's encouragement through patient education at the clinic and patients' scheduled clinic visits. This was higher than the stipulation outlined by the ADA that recommends an A_{1c} goal for adults of <6.5%. However, staff at the health care facility were not educated on diabetes or trained as diabetes educators (Chester, Stanely, & Geetha 2018).

Diabetes educators and care managers are the key originators that reshape services, which prevent, rather than just treat, patients' diabetes-related complications (Powers et al., 2017). Nevertheless, care management programs, working conditions, and diabetes education services have struggled with staffing shortages, limited funding, staff burnout, and competitive time demands (Salvagioni et al., 2017). Even under the best of circumstances, clinicians cannot provide the day-to-day support that people with diabetes need to proactively address self-management issues (Nowrouzi et al., 2015). Other significant barriers included lack of education on T2D, not keeping up to date on the latest in research and evidence-based practice, heavy workloads, and lack of incentives to be informed about diabetes-related knowledge and skills (Majid et al., 2011). Moreover, many nurses lack adequate knowledge of diabetes care and treatment to inform their practice and to support their patients (Ahmed, Jabbar, Zuberi, Islam, & Shamim 2012).

Diabetes requires continuing medical care and nurses should encourage and educate patients to self-manage their diabetes to prevent acute problems and to reduce the risk of long-term complications (ADA, 2017). In one study, a knowledge deficit about diabetes self-care was reported by patients aged 40 to70 years as one of the main reasons

for disease relapse and its complications (Zandiyeh et al., 2015). The authors also concluded that educational intervention by nurses was a vital component for patient with diabetes self-care. Important gaps in quality of care such as keeping up to date in evidence-based care, training, skills, and prevention strategies remain widespread despite their grave importance. Best practices in diabetes care require that nurses have an evidence-based understanding of disease management, and sufficient skills to deliver effective care to their patients (Burke, Sherr, & Lipman 2014).

Furthermore, there has been continued rise in the incidence of diabetes, which suggest that the numbers of affected persons and those with poor control of risk factors continue to grow (Ali et al., 2013). In this DNP project, I sought to answer: "How will an education program for staff on T2D compare to no education program regarding T2D?" The fundamental barriers that hindered their education on T2D were the lack of access to the latest in research and EBP, limited incentive for continuing diabetes education, and inadequate diabetes-related knowledge and skills. The development of an education program for staff on T2D was necessary to augment nurses' knowledge and skills to improve their performance using evidence-based guidelines. Because 43% of the patients at the health center have diabetes, it was only fitting that nurses have a higher knowledge of diabetes. The necessity to determine how knowledgeable staff were regarding diabetes cannot be overstated. Therefore, developing a plan of care using the ADA (2017), the diabetes self-management education (DSME, 2017), and the diabetes self-management and support (DSMS, 2017) guidelines, provided on-going knowledge and education with follow-ups for the patient with diabetes (Chester et al., 2018). In addition, the DSME is

the cornerstone in the treatment of diabetes, but the fundamental goal of DSME is to empower patients to be the responsible individuals in the management of their disease (Mohebi et al., 2013).

Purpose Statement

My purpose in this project was to develop an education program for staff and provide adequate knowledge and information using an evidence-based approach in treating diabetic patients with T2D at a health care clinic in southwest Michigan. This project improved staff's knowledge, skills, and attitudes on diabetes care and enabled them to use current evidence-based knowledge and focused their attention on prevention strategies and improvements in health care delivery for the patient with diabetes. Staff at the clinic used their knowledge and skills to educate patients on how to self-manage their diabetes. The gap in practice addressed by this doctoral project was the lack of adequate knowledge and education by staff on T2D.

The leading practice-focused question for this I used to guide this doctoral project was: "How will an education program for staff on T2D compare to no education program regarding T2D?" According to Greenwood, Gee, Fatkin, and Peeples (2017), clinical presentation and disease progression vary considerably for individuals with diabetes, and each client requires a different plan of care that is tailored to meet his/her individual needs. This education program incorporated specific evidence-based diabetes self-management intervention guidelines (Greenwood et al., 2017). Staff, at the clinic incorporated the DSME guidelines that assisted them in integrating evidence-based education and self-management support (Hass et al., 2012). My goal in this project was to

develop an education program for staff incorporating EBP guidelines for patients with T2D. Because the target audience was the clinic staff the application of current best practices and self-care strategies affected patients with diabetes in a positive manner in the control of their disease.

Nature of the Project

This project required thorough research on numerous scholarly literature such as the American Association of Diabetes Educators (2018), the National Health care Organizations, the ADA (2018), and Standards of Medical Care in Diabetes (2017). Research literature that I collected included search terms such as *education, self-management, T2D, nursing staff, health care costs, EBP guidelines,* and *self-care management.* Valid databases about diabetes included Medline with Full Text, Nursing and Health databases, PubMed, CINAHL Plus with Full Text for appropriate evidence-based policies and approaches.

This project warranted extensive synthesis of the research literature that objectively evaluated and explored the resources, effectively managed the project, and evaluated the quality standards set by national organizations. I sought evidence to develop this education program for a multidisciplinary health care facility. I used the ADA (2017) guidelines, the DSME and the DSMS standards as the basis of evidence. Other contributions came from internal and external resources, from internal medicine and other health care professionals related with the health care clinic.

To develop this education program, I collected standardized evidence-based material on T2D for an internal medicine health clinic used by staff in caring for patients

with T2D. This education program benefitted the health care professionals within the health care clinic as the basis for the management and implementation of evidence-based strategies for patient with diabetes.

Significance

T2D is one of the most common chronic disorders, and the financial and societal consequences are substantial and demand an urgent public health response (Reinehr, 2013). This project contributed to positive social change as clinic staff reviewed and changed their present approach on how to manage diabetic patients. Thus, it led to enhanced service to patient with diabetes, because they achieved a healthier and improved lifestyle. This is key for delivering essential health care as it may improve the health and general well-being and benefit communities (Hass et al., 2012). Because each patient with diabetes has unique needs, staff tailored the treatment plan to meet the needs of each client, which resulted in improved and better management of the disease. These approaches in care may result in an increase in patient's quality of life and decrease the rising cost of health care services (Kharroubi & Darwish, 2015). Providing diabetes education for staff equipped them with the tools to expand their current knowledge, attitudes, and skills, and focused their attention on prevention strategies for the patients with diabetes. According to Dorland and Liddy (2014), education programs represent basic elements that enhance diabetes management, and it is necessary to support patient education and self-management of diabetes.

For the diabetic patients, behavior and lifestyle changes are key to the successful management of diabetes with improved outcome of care. It is important at all levels of

diabetes prevention, that managing existing diabetes through prevention strategies or slowing the rate of diabetes requires continuous medical care beyond glycemic control (ADA, 2018). Ongoing patient self-management, education, and support are critical to prevent acute complications and reduce the risk of long-term complications. My general intent in this project was to develop an education program for staff so they would be more knowledgeable, well-equipped. and skilled to use EBP guidelines to deliver quality diabetes care to the patients. Adopting risk reduction behaviors and strategies geared toward the patients with diabetes may decrease the economic burden of diabetes, increase promotion of healthy behaviors, and improve the availability of evidence-based lifestyle programs (Geiss et al., 2010).

Summary

T2Dis a complex disease that affects more than 20 million Americans and is one of the major causes of disease morbidity and mortality in the United States (Carpenter et al., 2017). It is a debilitating and metabolic disease that can be prevented through lifestyle modification, structured diet, and weight control. Nurses play a pivotal role by becoming knowledgeable, skilled, and empowered by integrating EBP guidelines in their education and training. In addition, staff should be qualified to promote the components of diabetes care, general treatment goals, guidelines, and tools to evaluate quality of care by incorporating the ADA's (2017) current clinical practice guidelines. It is essential that staff encourage patient with diabetes to adhere to medication management, engage in self-management of their disease, seek help, ask questions, and comply with follow-up appointments. These are basic tools for improving patients' lives and will allow them to

stay healthy, while at the same time decrease health care costs associated with diabetes. Developing an education program for staff would increase their knowledge and skills and enable them to stay up to date on the latest trends in research and EBP. These goals may be accomplished by continuing education programs to further improve staff knowledge in diabetes and acquire in-service training at the health care facility. In Section 2, the theoretical models were described and used to guide this staff education on T2D.

Section 2: Background and Context

Introduction

T2D is of increasing concern in the medical field and at the community level given the growing number of cases (Dabelea, et al., 2014; ADA, 2014). It is vital for the nursing profession to remain current and knowledgeable about T2D to provide effective service to this growing demographic. There is evidence that the issue of adequacy about diabetes among nurses has been of concern for some time. Research, such as the Jayne and Rankin's (1993) study, dates more than 20 years, and this issue remains of concern today. It is imperative, therefore, that nurses equip themselves with diabetes knowledge so that they can impart the information and skills needed for the diabetic population. It is important also that an evidence-based approach be incorporated into their learning and knowledge (ADA, 2017; White, Dudley-Brown, & Terhaar, 2016). Only with this knowledgeable and well-equipped staff can the issues of T2D be effectively treated and managed.

The practice-focused question for this DNP project was: Will an education program on T2D increase staff's knowledge compared to no education regarding T2D? At the clinical practice site staff lacked education on how to effectively manage and treat patients with T2D. Through an education program staff will use their knowledge and skills to educate patients on how to self-manage their diabetes using evidence-based strategies. My purpose in this doctoral project was to ensure that staff had adequate knowledge and information regarding best practices and approach in treating and educating diabetic patients with T2D. In this section, I will present the theories, models,

and framework that I used to guide the project and will incorporate evidence-based concepts and strategies. In addition, in this DNP project, I will discuss the relevance to nursing practice, considering the local background and context, and I will include my role as the DNP student, the role of the project team, and the summary.

Concepts, Models, and Theories

Nursing theory provides the framework for understanding concepts or ideas and their relationships (Smith & Liehr, 2018). Alligood (2018) added that nursing theory has been a significant theme in nursing and was instrumental in promoting professional growth on a global scale. Further, nursing theoretical systems provide direction for practitioners, give an understanding of practice (Alligood, 2014) and provide direction for best care practice (Korukcu, Deliktas, Aydin, & Kabukcuoglu, 2017). Thus, any venture designed to improve patient outcomes must be founded on sound and appropriate theory.

The theories selected to guide this DNP project were the Orem (1991) self-care model (SCM) (Shah 2015; Berbiglia & Banfield, 2018), the Bandura (1977) self-efficacy theory, and the Knowles's (1968) adult learning theory. These theories and models contributed to different aspects of the project to create an ideal experience that promotes positive outcomes in the treatment of T2D.

The SCM (see Appendix A) provided the philosophical foundation of the project. Orem was a firm believer that people have a natural ability for self-care and nursing should focus on strengthening that ability (Orem 1991). This theory is both descriptive and prescriptive and will guide in achieving the goals of this staff education program as it

promotes a pattern of healthy behavior that in turn will elicit change (Mc Ewen & Wills, 2014). The SCM provides a guide to nurses practicing in various health care settings and with patients throughout their lifespan and at various stages of the health illness continuum (Simmons, 2009). Furthermore, the SCM was designed to guide practitioners to promote adherence and motivate patients through advanced skills that can inspire them to make behavioral changes (Baghbanian & Toll, 2012). The theory also proposed that the patient plays an active, responsible and involved role including diabetes self-care leading to improved outcomes, such as better quality of life and a longer lifespan (Zareban, Karimy, Niknami, Haidarnia, & Rakhshani, 2014). It was primarily the emphasis on promoting patient self-care that was foundational to this project. Given the significant association between self-care and quality of life and lifespan for patients with T2D (Babazadeh et al., 2017; Zareban et al., 2014; & Mohebi et al., 2013), the advanced practice nurse (APN) should be equipped to motivate and train patients with T2D for self-care. One means of equipping and motivating patients is through training.

A meta-analysis of 16 randomized controlled trials supported the belief that properly conducted self-management training and interventions improve health outcomes in patients with T2D (Cheng et al., 2016). Further, research indicated a positive correlation between health literacy and self-care among patients with T2D (Lee et al., 2016; Lee, Lee, & Moon, 2016) with health literacy having a direct positive correlation with self-care and further indirectly affecting self-care as mediated through self-efficacy (Lee, Lee, & Moon, 2016a). Consequently, APNs can foster increased patient self-care by improving patient self-efficacy and can help to promote this self-efficacy through the

implementation of health literacy measures (Lee et al., 2016b). Conversely, studies have suggested a lack of awareness by individuals about their disease resulting in noncompliance with their treatment (Miller, 2016). Similarly, there was indication with low self-efficacy rates among patients with T2D (Mohebi et al., 2013), which can hinder self-management (Richardson, Derouin, Vorderstrasse, Hipkens, & Thompson, 2014). Thus, to control this disease, it was important to identify the educational needs of the patients (Borji et al., 2017). Thus, health literacy was warranted.

As patients realize that the responsibility is theirs to engage in a lifestyle that allowed them to form healthy habits and to take responsibility for their own actions of care, and feel efficacious and empowered in doing so, positive health outcome resulted (Eller et al., 2018; Lee et al., 2016). It was clear, then, that efforts to provide health literacy and foster self-efficacy for patients with T2D were beneficial, warranted, and needed to be a primary consideration in clinical practice (Lee et al., 2016). Thus, using the SCM can regulate the effective factors on growth and patient's performance in relation to life, health, and well-being (Borji et al., 2017) and, given the associations discussed earlier, it was evident why for the purposes of this project, the SCM will be combined with the Bandura (1977) self-efficacy theory.

Bandura (1977) proposed that the strength of self-efficacy was a determinant of whether an individual would initiate a behavior. In other words, a person was more likely to initiate or engage in a behavior if he or she feels confident of his/her ability to do same. Therefore, a patient with T2D would be more willing to engage in self-care if he/she believed that he/she could conduct self-care effectively. Advanced practice nurses

should then be equipped to foster self-efficacy and promote health literacy among patients with T2D. Advanced care practitioners are becoming more critical in providing care for chronic diseases (Woo, Lee, & Tam, 2017) and they should have the knowledge and self-efficacy to perform effectively in their roles. Thus, it was important to assess the level of knowledge and competence of APNs and provide requisite training. The self-efficacy theory can be seen in Appendix B.

Assessment was necessary to determine the level of knowledge of APNs regarding the treatment of patients with T2D, and interventions were designed for these APNs when a deficit was discovered. It was in designing this intervention that the Knowles theory was applied (see Appendix C). This theory developed by Malcolm Knowles provides guidelines for andragogy (Knowles, 1968). The theory states that adult learners should be actively involved in designing their learning experiences and that learning activities should be relevant, problem-centered and based on the learners, experiences (Knowles, 1968). In other words, intervention training for staff needs interactivity and connection to the nurses' previous knowledge and experience to increase their learning and self-efficacy.

Consequently, the intervention designed for the staff included a diabetes knowledge test (DKT), which comprised a pretest, lecture/educational intervention followed by the posttest, and the nursing staff experiences for relevance. As noted by Palis and Quiros, (2014), lectures have been the main methods used when delivering knowledge in academic teaching. Additionally, it has been employed in a variety of situations to teach theoretical knowledge in health care ranging from classrooms for

nursing students and medical students to conferences and continuing medical education exercises (Palis & Quiros, 2014). Moreover, lectures have proved to be as effective as other teaching methods for delivering knowledge and information and are still among the cornerstones of academic teaching when appropriately combined with other strategies (Palis & Quiros, 2014). Lectures have also been familiar territory to the medical student and will be included in the lineup of strategies utilized in the intervention.

Relevance to Nursing Practice

Diabetes education is the main element in diabetes care because it may delay comorbidities and increase glycemic control in the patient with diabetes (ADA, 2017). Black et al. (2015) stressed the importance of knowledge and research in health care that have received significant attention and scholarship in recent years. Furthermore, the authors proposed that health care workers should participate in continuing education, be clinically competent and include current best practice to enhance the quality of nursing care they provide to their patients (Black et al., 2015). In addition, the National Institute of Nursing Research (NINR, 2013) at the National Institutes of Health (NIH, 2013) have promoted and supported evidence-based research and self-management science as core areas of investigation, to improve and manage symptoms of chronic illness such as T2D (Fukada, 2018).

The gap in practice for this DNP project was addressed based on applying standardized national diabetes guidelines to educate nursing staff and better equipped them to provide best practice to their diabetic patients and teach them how to effectively self-manage their diabetes for improved clinical outcome. Accordingly, nurses are

specially, knowledgeable to teach self-management strategies, include evidence-based protocol in the care plan for individuals and various people, whether they are treating a chronic condition or sustaining wellness by serving as the bridge from research to practice (Grady & Gough, 2014). The ADA (2017) proposed integrating sound diabetes education program that is patient-centered, culturally appropriate, tailored to meet the needs of each patient from all ethnicities especially those with different cultural, religious, social, and socioeconomic background

Local Background and Context

In the United States, approximately 30.3 million adults 18 years and older have diabetes of which 23.1 million are diagnosed (CDC, 2017). In Michigan alone, the prevalence of diabetes in adults 18 years and older was 11.2% and was ranked the seventh leading cause of death in Michigan (Michigan Department of Health & Human Services, [MDHHS], 2019). The data from the Michigan Behavioral Risk Factor Surveillance System (MiBRFSS, 2011-2016), indicated that the age adjusted incidence of diabetes among adults was comparable from 9.2% in 2011 to 9.8% in 2016 without any signs of change. Accordingly, the MDHHS (2019), showed that compared with females, males have a higher incidence to that of females combined (10.9% versus 9.7%) for the period 2011-2013.

In the non-Hispanic black adult population 18 to 44 years (4.8%) diabetes ranked nearly twice that of non-Hispanic white adults 18 to 44 years (2.7%) (CDC 2017, MiBRFSS, 2017). In 2006, Michigan’s age-adjusted diabetes death rates were 29.0 for white males, 21.3 for white females, 47.8 for black males, and 36.5 for black females.

Also, in Michigan 28.8% adults with diabetes have heart disease and stroke, 53.3% have high blood pressure, 55.9% have high cholesterol, 42% have been diagnosed with end stage renal disease (ESRD), and 20.1% have visual impairment (MiBRFSS, 2013; 2015). These data are disturbing because the incidence of diabetes continues to rise and has rapidly become one of the most prevalent and costly chronic diseases worldwide (Bommer et al., 2017).

This DNP project completed at an outpatient internal medicine facility in southwest Michigan served a patient population of approximately 350 or more adults 18 years and older. The patient population consisted primarily of persons of African-American descent and of the 350 patients, 150 (approximately 43%) were diagnosed with T2D and had a typical A_{1c} of 7.5% to 8.0% or higher. During the past year, staff at the clinic noticed that many patients who attended the clinic had elevations in their hemoglobin A_{1c}. Staff also identified that self-care management of diabetes was a struggle for some patients and noncompliance ranked high among diabetic patients. These numbers were high despite the clinic staff's encouragement through patient education at the clinic and patients scheduled clinic visits. The elevated results may have been lack of provider's knowledge to adequately address the patients' educational needs and concerns on how to care and self-manage their disease.

Providing self-care guidance may help to mitigate both the financial and personal burdens of T2D. Furthermore, on an individual level, patients with diabetes are at increased risk of associated clinical and serious complications of the disease if not managed properly (Leon et al., 2015; Ryder et al., 2013). Proper control and treatment of

diabetes is crucial as both the prevalence, economic, and individual burdens of the disease continue to prove critical (Leon et al., 2015). It was imperative that health care providers be educated on best practices on how to teach patients with diabetes how to care and self-manage their condition.

Role of the DNP Student

It was evident that T2D constitutes a major health problem for the adult population at the health care facility (Richardson et al., 2014). Evidence suggests that the role of the DNP nurse is to improve clinical outcomes for patients with T2D in primary care practices (Richardson et al., 2014). For example, such improvements can be initiated through the APNs capacity to foster change and improve adherence to treatment plans (Richardson et al., 2014), such as through health literacy and nurturing self-efficacy in patients. In addition, evidence-based nursing is recognized as an indicator of quality in nursing practice, a basis for accountability and the gold standard of professional nursing care (Varaei, Salsali, Cheraghi, Tehrani, & Heshmat, 2013).

Consequently, at the medical center where the staff education program was conducted, I promoted self-care approaches and presented effective strategies for teaching patient with diabetes. My role as a DNP nurse allowed me to use my skills, training, clinical knowledge and experience to facilitate increase patient management skills, and consequently achieve better patient outcomes. It is recognized that the APN is empowered, knowledgeable and well-equipped to operate semi-independently, in patient care and the DNP prepared nurse can provide care that is unique to suit each patient's

situation and implement effective health care using EBP guidelines (Richardson et al., 2014). It was these traits that I employed to conduct this DNP project.

Role of the Project Team

The project team consisted of eight health care providers, front desk staff, medical assistant, student nurse, nurse practitioners, office administrator, the medical doctor, phlebotomist, and medical records personnel. The team helped put together a patient list of those whose hemoglobin A_{1c} was higher than 7.5%, and uncontrolled. As the leader for this education program my role as a DNP student was to facilitate these therapies and preventative measures. I collaborated with the staff and medical doctor at the health care facility to ensure that the education program met the needs of the clinic. Staff at the health facility communicated areas of concern they had and that needed clarification throughout the education program.

Summary

T2D is a chronic debilitating disease that affects millions of people, but it can be controlled through medication, regular testing of blood glucose, and structured diet and exercise program (Gonzalez, Shreck, Psaros, & Safren, 2015; Mohebi et al., 2013). Consequently, patients should be educated about the nature and treatment of the condition and motivated to self-care to achieve positive health outcomes (Babazadeh et al., 2017; Lee et al., 2016). APNs should be equipped to provide this training and motivation.

The goal of this education program was to determine the level of knowledge of staff about T2D, patient self-care and their ability to provide effective care for patients

using evidence-based strategies and skills. In the project, I used a diabetes knowledge pretest and posttest as well as an intervention founded on three theories—the Orem SCM, the Bandura self-efficacy theory, and the Knowles adult learning theory. The SCM was foundational and established that patient have better outcome when they self-manage. The Bandura theory proposed that self-efficacy motivates action, and the Knowles theory provided a guide for designing the education intervention for clinic staff. In Section 3, I further discussed and evaluated the techniques used to improve the plan and applied the education program at the selected medical health care center.

Section 3: Collection and Analysis of Evidence

Introduction

My purpose in this project was to develop an education program for staff that provided adequate knowledge and information using current evidence-based approaches in treating diabetic patients with T2D. The goal of this education program was to determine the knowledge level of staff on T2D and their ability to provide effective care for patients using evidence-based strategies and skills. Staff at the clinic participated in an education program and a pretest and posttest assessment was performed to measure the knowledge levels and attitudes of the staff on T2D with special emphasis on patient self-care. The pretest and posttest were separated by an educational intervention that entailed pertinent information related to current EBP approaches to educate staff on T2D.

Implementing a solid plan in place allowed for staff to increase their knowledge about diabetes, and created the confidence and skills needed to address diabetes and its complications. The outcome of this project enabled staff to improve their knowledge on diabetes, its management and to incorporate EBP guidelines in caring for patients. This section will include the practice-focused question and the sources of evidence for the DNP project. It will further describe the analysis, synthesis, and reliability of the evidence that would be included in the project paper.

Practice-Focused Question

The gap in practice for this doctoral project was the lack of adequate knowledge by staff on T2D, time constraints when engaging with patients, and the inability to provide the day-to-day support for patient with diabetes to allow for self-management.

The clinical practice issues for this project was the lack of knowledge about T2D by staff at the clinic and how they may utilize their knowledge and skills to educate patients on how to self-manage their diabetes through an education program. The practice-focused question was: Will an education program for staff on T2D increase their knowledge skills, compared to no education program regarding T2D?

Sources of Evidence

This project retrieved information from two sources of evidence. The first was a literature review on knowledge and attitudes regarding diabetic outpatient management by nursing staff. The other source of evidence was an education program for staff that included a diabetes knowledge pretest and posttest where the results were compared. In order to accommodate the program, the office manager ensured that staff were provided scheduled time off. The education program included the diabetes knowledge pretest and posttest, the ADA (2017) guidelines, the DSME and the DSMS, standards for using current best practice in diabetes care.

This doctoral project incorporated the diabetes knowledge test (DKT) as the measuring instrument to determine and assess the level of diabetes knowledge among clinic staff. This tool was used in the past to evaluate and assess the knowledge of health care providers and patients' knowledge of diabetes. It was developed by the Michigan Diabetes Research Training Center (MDRTC), comprised of 23 multiple choice test questions, 14 general knowledge type diabetes questions, and nine questions that are insulin-based. For this project the administered pretest/posttest consisted of only the 14 general knowledge type diabetes questions, and the last three questions developed by the

project leader were used for evaluation of the project. Permission was given to use this tool, which proved to be reliable and valid in a study conducted by the MDRTC (MDRTC, 2015). (See Appendix D for permission to use the DKT.)

Preceding the education intervention, I gave the paper and pencil-formatted pretest that consisted of the 14 general knowledge diabetes type questions that assessed staffs' knowledge about diabetes. The pretest was collected followed by the educational intervention after which the same questions were distributed for the posttest. Staff was given the opportunity to ask questions and the project leader clarified any misunderstanding about T2D and best practices. The pretest and the posttest were counted and the numbers of questions which were answered correctly/incorrectly were recorded.

My purpose in this DNP project was well aligned with the evidence-based resources and supported by EBP guidelines for staff's education and training. By incorporating current clinical practice guidelines, staff was better able to promote the components of diabetes care and general treatment goals that allowed them to evaluate quality of care. Managing diabetes would also help keep it under control and prevent any long-term complications. However, for treatment to be effective standardized self-management treatment must be taught together with modification of lifestyle choices. Implementation of evidenced-based guidelines with regular follow-up would improve patient compliance and allow diabetes educators and other health care providers to deliver current standards of care and avert any long-term complications (Shrivastava et al., 2013).

Valid databases included Medline with Full Text, nursing and health databases, PubMed, the ADA, the CDC, and CINAHL Plus with Full Text about diabetes were utilized for appropriate evidence-based policies and approaches. The key search terms to retrieve the evidence included *nursing education, diabetes management, diabetes knowledge skills, current standards of diabetes care, evidence-based practice,* and *diabetes educators.* These were used together with the search engines to retrieve evidence from the literature. I used the diabetes knowledge pretest and posttest to measure the knowledge levels and attitudes of the staff on T2D with special emphasis on self-care.

Evidence Generated for the Doctoral Project

A source of data for the project was evidence gathered from extant research literature regarding nursing knowledge on diabetes and current evidence-based strategies for nursing practice with patients with diabetes. The other source of evidence was an education program for staff that included a diabetes knowledge pretest and posttest where the results were compared. To accommodate the program, the office manager ensured that staff was given scheduled time off. The questions from the pretest and posttest for the education program were obtained from the Michigan Diabetes Research Center (MDRC). The MDRC is an instrument for diabetes patients and health professionals and represents a test of general knowledge of diabetes.

The pretest and posttests were separated by an educational intervention that provided pertinent information related to EBP approaches to educate staff on T2D and patient self-care. As the leader, I conducted the education program for the staff, explained the dynamics on diabetes related research, and incorporated current EBP guidelines for

patients with diabetes. Furthermore, I explained the benefits on the usefulness of applying the information to determine what needed to be done to promote the health and well-being of patients with diabetes. I encouraged staff to participate in the education program by asking questions pertaining to the application of best practices to ensure the ongoing support for the diabetic patient.

Participants in this project included staff members at the out-patient clinic who were in daily contact with the patients. Staff were informed that the project would consider their current knowledge on T2D, how to apply current EBP measures for better management of diabetes, and patient outcome. They were asked to participate in the education program and their knowledge on diabetes were assessed by taking a pretest and posttest. The results were compared to the evidence-based literature about the success of applying evidence-based education on strategies to reduce any long-term complications related to diabetes. They were instructed on the use of best practices as evidenced by incorporating current EBP guidelines and strategies in caring for their patients. Additionally, it improved their knowledge and skills on how best patients can care for themselves to better manage their diabetes.

The target clinic was where the education program for staff was conducted and implemented upon approval by Walden University from the Institutional Review Board (IRB). The pretest and posttests questionnaires were available in paper form and were presented just before and after the education presentation. Also, staff were told that when they completed and returned the pretest and the posttest questionnaires that participation was regarded as consent to take part in the project. Clinic staff were instructed that their

involvement in this project was voluntary and that their choice to participate or not to participate in this exercise was respected. No further ethical problems were envisioned when the project commenced, and staff were provided the right to withdraw at any-time. I assured staff that their identities would remain anonymous, confidential, and private.

Analysis and Synthesis

To evaluate this study, I used a statistical review; therefore, a statistical package was required, and it was descriptive in nature. It included the number of study participants, and the scores from the pretest and posttest delivered in a question type format. The collection of data was analyzed using the paired *t*-test (see Table 1) to compare the clinic staff's knowledge on diabetes from the pretest and the posttest questionnaires. However, after the education intervention to assess change in staff knowledge the results from the pretest and the posttest were analyzed to establish any differences in the number of corrected answers given.

Summary

In this segment of the paper, I focused on the general approach that I used to carry out this project. I described the venue for the project, the clinic staff, the types of patients who visited the clinic, data analysis, and how I collected information. The potential benefits of this project were to increase staff's knowledge and skills about diabetes and implement evidence-based strategies to teach patients how to self-manage their diabetes. Section 4 includes findings and implication of the study, and I address recommendations for the project.

Section 4: Findings and Recommendations

Introduction

There are challenges faced by health care providers in the primary care setting, and these may include the lack of knowledge about T2D, failure to adequately provide support to allow patients to self-manage the disease and the skills to use current evidence-based strategies. Over the past year staff at the health clinic noticed an elevation in the patients' hemoglobin A_{1c} levels of 7.5% to 8.0% or higher in 43% of the clinic patients who had diabetes. The possible cause of this problem unearthed the gap in practice could be the lack of adequate knowledge by staff on T2D, time constraints when engaging with patients, and the inability to provide daily support for patient with diabetes to allow for self-management. These assumptions enabled the clinic staff to participate in an onsite T2D education program at the clinic to allow them to be more knowledgeable and to support and encourage patients how to self-manage their diabetes and be compliant based on their specific needs. The practice-focused question addressed in this project stated: *Will an education program for staff on T2D increase their knowledge skills, compared to no education program regarding T2D?*

The staff at the health clinic were the target group for this DNP project and consisted of eight health care providers, front desk staff, medical assistant, student nurse, nurse practitioners, office administrator, the medical doctor, phlebotomist, and medical records personnel. They volunteered to take part in this education program which incorporated the application of current EBP measures for effective management of diabetes and patient outcome. The purpose of this doctoral program was to ensure that

staff had proper knowledge and evidence regarding best practices and approach in treating and educating diabetic patients with T2D. Providing diabetes education material to patients would allow them to understand the disease process, enable them to self-manage their diabetes, be compliant with their medications, and have the conviction that the staff will be readily available to assist them when necessary. These increased patient benefits and education allowed for diabetic management of patients by clinic staff through efficient follow-up calls and between additional scheduled visits.

Sources of Evidence

For this project the sources of evidence included valid databases such as Medline with Full Text, Nursing and Health databases, PubMed, the ADA, and the Centers for Disease Control (CDC). The CINAHL Plus with Full Text database about diabetes were utilized for appropriate evidence-based policies and approaches. The key search terms used to retrieve the evidence included nursing education, diabetes management, diabetes knowledge skills, current standards of diabetes care, evidence-based practice, and diabetes educators. These were used together with the search engines to retrieve evidence from the literature. The project utilized pretest and posttest assessment to measure the knowledge levels and attitudes of the staff on T2D with special emphasis on self-care and management.

Findings

This educational program was successful and attained its goal in advancing the knowledge of T2D among staff at the health care facility. Accordingly, the pretest mean score was 10.78, and the posttest mean score was 12.00 which resulted in a mean increase

of 1.22 (see Table 1). Also, the differences in the scores from the pretest and posttest questions can be seen in Table 1. In addition, a paired samples t-test was performed which compared the staffs' posttest scores to the pretest scores. A significant difference was seen in the pretest scores (M = 10.78, SD = 1.641), and posttest scores (M =12.00, SD = 1.000), t (8) = - 2.345, P = 0.047. These results suggested that the educational intervention on T2D increased staffs' knowledge compared to the pretest knowledge scores. Moreover, as stated by the MDRTC (2015), the more correct answers attained, the more knowledgeable the participants. Hence, results from this project confirmed that there was improved knowledge of staff that received the education intervention onT2D (see Table 1).

Table 1

Paired t Test

Paired samples statistics

		M	*N*	*SD*	*SEM*
Pair 1	Test scores before education	10.78	9	1.641	.547
	Test scores after education	12.00	9	1.000	333

Paired samples correlations

			Correlation	*Sig.*
Pair 1	Test scores before	!	.381	.312

Paired samples test

		Paired Differences			
		M	*SD*	*SEM*	95% CI of the difference lower
Pair 1	Test scores Mean Difference of before education Test scores and after education	-1.222	1.563	.521	2.424

Paired samples test

		Paired Differences 95% Confidence Interval of the Difference Upper		*df*	Sig. (2-tailed)
Pair	Test scores before education Test scores after education	-.020	45	8	.047

Implications

Staff should be motivated to take exceptional care when attending and overseeing patient with diabetes, especially when it comes to educating them, and assisting them to self-manage their disease. Prevention is foremost in averting any long-term complications associated with T2D. Not to mention that diabetes places a financial strain to an already over-burdened health care system. However, despite the fact that preventative measures are crucial, the main goal was to decrease diabetes and its socio-economic burden it places on society and provide optimum care to existing diabetic cases. The task at hand, therefore, was to enhance the quality of life of persons diagnosed with diabetes and those who may be at risk for the disease (Healthy People 2020).

Results from this project were consistent with other studies that have suggested that through education and training about diabetes self-management and best practice, nurses acquire improved knowledge and skills that were necessary to teach patients how to care and self-manage their diabetes (Germossa, Sjetne, & Hellesø, 2018). These standardized diabetes instructions are intended to address patients' cultural beliefs, emotional and family concerns, financial needs and other factors. Accordingly, many of these interventions have also been shown to be cost-effective (Powers et al., 2017).

Moreover, these guidelines are the foundation in the treatment of diabetes and may be used to empower the patients to be responsible in the management and care of the disease. To the nursing staff for example, knowledge is power and the more they know about diabetes the more they may be able to employ the required skills to teach and inform patients on how they can self-manage or control their disease. To the patients, the

information that they receive from staff the better their chances may be in minimizing and preventing complications (Mohebi et al., 2013).

Additionally, patients may be encouraged to follow current clinical and evidence-based guidelines when engaging in their own care. This project has the capacity to provide positive social change as staff's knowledge about T2D increase and evidence-based strategies are incorporated into their plan of care. This may lead to healthier lifestyles for the diabetic patients as they manage their diabetes. Furthermore, when standardized diabetes guidelines are implemented such as the DSME, the DSMS, and the ADA, (2017) recommendations, these standards of care may also contribute to positive social change in the community as patients experience reduced health care costs.

Strengths and Limitations of the Doctoral Project

The strength of this DNP project was the cooperation and support of the medical director and staff in allowing the DNP student to conduct the staff education program. Although the clinic was very busy the medical director and staff engaged and collaborated with each other about the strategy for the education program. Based on the national standards of DSME, the purpose of seeking stakeholder input was to gather information and foster ideas that would improve the utilization, quality, measurable outcomes, and sustainability of the DSME services (Beck et al., 2018). An added strength to this project was the interest they showed with regards to learning and understanding the mechanism of management of this disease. Also, the teaching materials put together by the DNP student was clear, up-to-date, evidence-based and made for easy reading and understanding.

The limitations of this study could be attributed to the small sample of participants which may have excluded inference of the findings and may have created bias. As such, a bigger sample of participants would have included more variation in experience and knowledge and the results and analysis may have been quite different.

Recommendations

In order to enhance nurses' knowledge on diabetes, emphasis must be placed on further education, on-going training and the implementation of evidence-based strategies and skills. Ahmed et al., (2012) suggested that nurses play a pivotal role in the treatment of patient with diabetess and they should be well prepared to implement recommended standards of care. For example, the ADA (2015; 2017) recommended that DSME may be a worthwhile benefit as they have shown to improve hemoglobin A_{1c} in patients and can be cost-effective by decreasing hospital stay. As such, nurses who spend time with patients as diabetes educators promise better patient outcome. However, providing support for the patients may be accomplished through a range of public outreach programs that may benefit the patients and provide quality of care (ADA, 2015).

Staff at this health care facility benefitted from the educational intervention provided by the DNP student. Since there is no diabetes educator at this facility, the clinic may benefit from on-going diabetes education and training provided by health care professionals. Therefore, implementing current regular educational program may increase staff's knowledge about T2D, and allow them to incorporate evidence-based guidelines into their daily teaching schedules and enable patients to self-manage their diabetes. As proposed by Gerald et al., (2010), the structural educational base for nurses must be

supported through continuing training programs, proficiency, and keeping up to date with current best practices on T2D.

Summary

The aim of this DNP project was to educate staff on T2D, implement evidence-based strategies and skills so staff could teach patients how to self-manage their diabetes. Findings from this project showed that some clinic staff were responsive to learn and employed the educational resources and training they received. Based on the educational intervention and learning outcomes, the DNP leader is confident that the education program benefitted the staff, the health care clinic, and the patients. In order to create a knowledge base and support professionalism in nursing, the DNP student maintains that there should be continuous training, teaching, and management of diabetes education. However, more research on proficiency and practice are warranted for education and training programs for current and future use.

Section 5: Dissemination Plan

The venue for the dissemination plan was at the health care clinic. The project's aim was to guarantee that each person who participated in the education program understood their functions and exhibit adequate knowledge to educate their patients on current best practices of T2D. Those who participated in the education program consisted of front desk staff, medical assistant, student nurse, nurse practitioners, office administrator, the medical doctor, phlebotomist, and medical records personnel. Since staff were more knowledgeable about T2D the onus was for them to teach and support patients to maintain glycemic control of their $A_{1c.}$ Hence, education and early management of diabetes may help curb complications of the disease.

As the leader for this project, I ensured evidence-based guidelines and strategies were delivered via teaching methods to the staff. Therefore, based on the education that the staff received, the responsibility was theirs' to inspire and to encourage their patients to learn more about diabetes and how to manage it correctly. On the other hand, having a diabetes educator for ongoing diabetes education and evidence-based strategies would be vital to the staff and may benefit the patients.

This planned education program provided ample information and was simple enough for the staff to understand and was tailored to meet the needs of the clinic, the staff and the diabetic patients. The recommendations and guidelines issued by the ADA, DSME, and the DSMS planned programs are standardized practices aimed to assist the patient with diabetess. All the teaching materials were organized in a folder and given to staff for future review, and quick data retrieval. The feedback from the posttest and the

education program indicated that staff had a better understanding of diabetes related care for patients and evidence associated skills to provide better care and involve patients in the process. Staff were asked to evaluate and provide feedback on the quality of the in-service session. Accordingly, improvements of health care needs of the patients can only be enhanced by the dissemination of recommendations that are simple to find and familiar by both providers and patients alike (Schipper et al., 2016).

Analysis of Self

Throughout my nursing career I have cared for many patients with diabetes and although many of them were compliant with their care others were not. Becoming a nurse practitioner, I have also had to deal with many noncompliant patients as well. However, I am more knowledgeable now as I was able to incorporate evidence-based teaching strategies to the staff at the clinic. Additionally, when caring for patient with diabetess, it is essential that they are educated on best practices that will assist them in managing their diabetes. As stated by the ADA Standards of Care (2019) guidelines must always be interpreted for each patient and situations in mind, but the patients' values and feelings must be considered to allow for different treatment goals and strategies. This I hope to engage in as I forge ahead in my practice.

As a scholar, being knowledgeable to address issues on a wide range of educational activities are essential in order to fulfil that responsibility. Accordingly, the American Association Colleges of Nursing (AACN, 2006), outlined set guidelines to direct nurses as they transition from one area of their profession to another. For example, it allowed for collaboration and for improvement in patient and population health

outcomes. As such, these guidelines have helped me to conduct the in-service education at the health care clinic to teach and educate staff to be effective as they utilize standardize guidelines on T2D to teach and care for their patients.

As the project leader the various guidelines have provided avenues for communication, collaboration, and consulting with other health professionals (AACN, 2006), and staff on how to manage and coordinate care. As I continue to grow and to improve in my clinical experience, I am also increasing in my role as a DNP nurse to keep abreast with these ever-growing changes in health and technology. This clinical experience was very rewarding and challenging for me, and I am more informed now to make sound decisions in my practice and education. Also, I have learnt a lot from this doctoral project and will put my knowledge and skills into good practice while I establish myself in obtaining my DNP degree.

Summary

Knowledge about T2D is crucial when delivering care to diabetic patients. This doctoral project educated staff about T2D and how they may incorporate evidence-based strategies and skills in their practice to care for the patient with diabetes. Staff at the clinic lacked education on T2D and evidence-based guidelines, and as such, proper delivery of care was not met. However, an educational program was implemented, and the knowledge deficit was addressed. Based on the findings from the pretest/posttest, staff was more knowledgeable on T2D. This educational project was effective and simple to understand as expressed by one staff member who said she had a “better understanding of T2D diabetes” while another expressed “more confidence” in teaching patient with

diabetes. I believe this education may benefit the staff, the clinic and the patients for overall diabetes care in the future.

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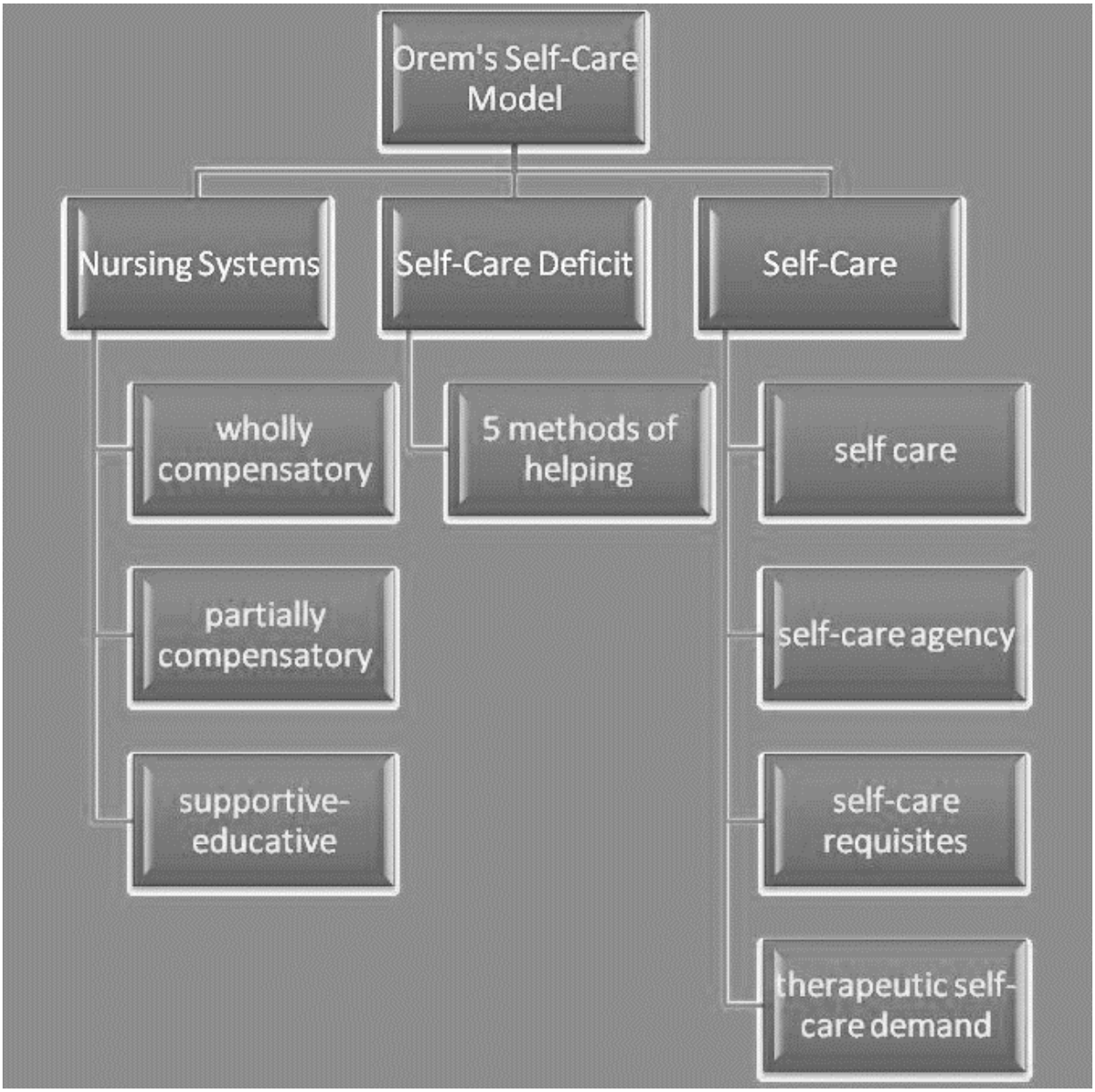
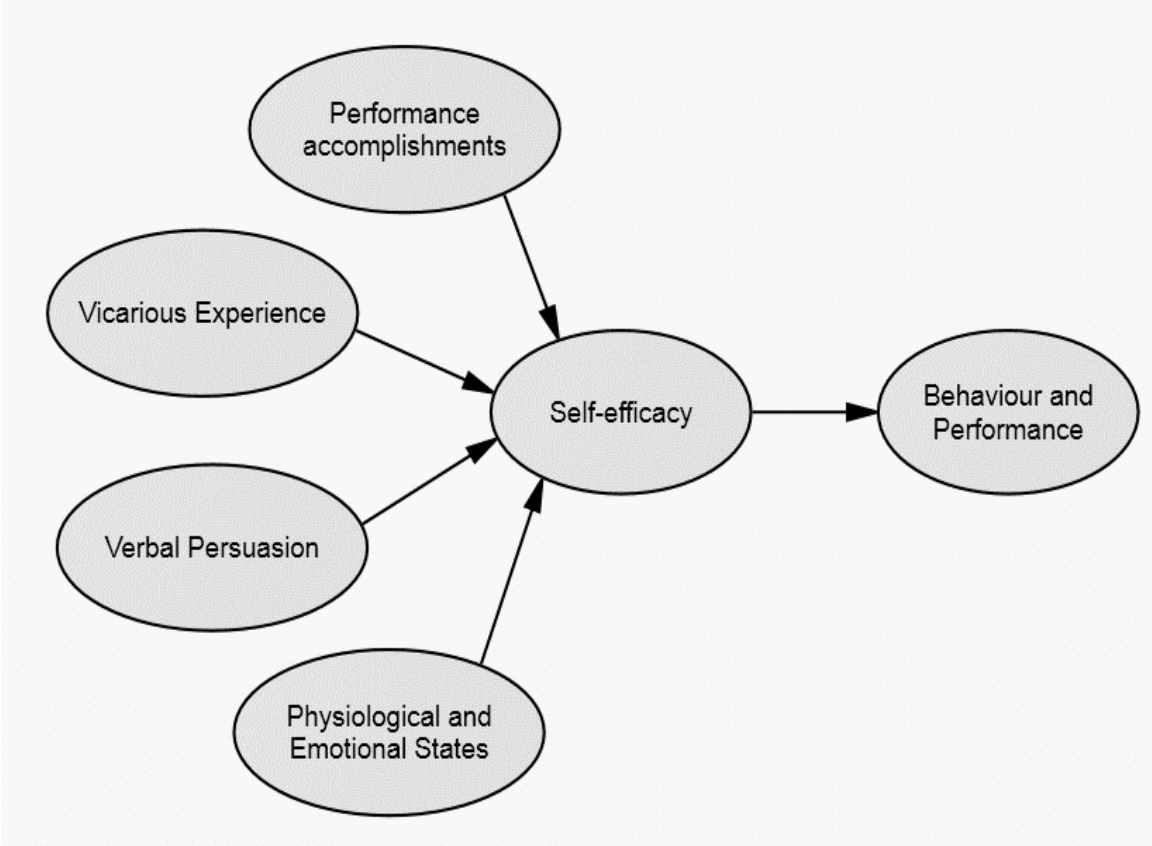
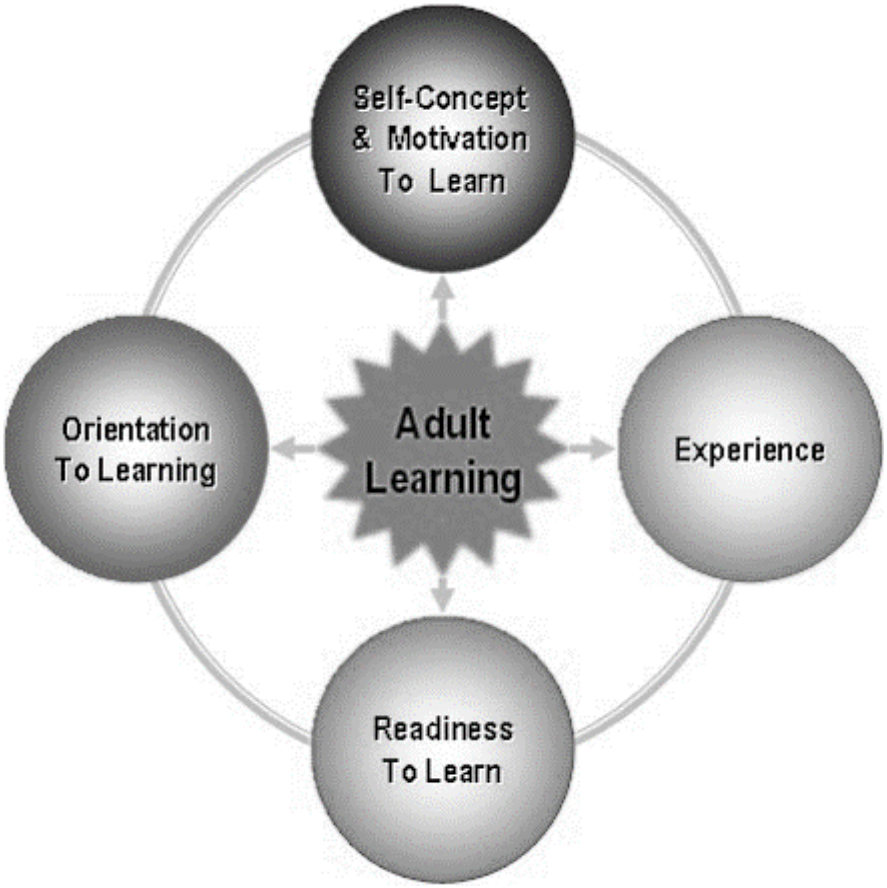
Appendix A: Orem's Self-Care Model



Appendix B: Bandura Self-Efficacy Model



Appendix C: Knowles's Adult Learning Theory



Appendix D: Permission Letter

Ms. Williams,

Mrs. Cudjoe,

You have my permission to use the test. We do have a revised version, the (DKT2, 2016); the test and the article describing the test are attached. If you have any questions, please contact me. Good luck with your study.

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Appendix E: Pretest

Please circle the correct answer

1. The diabetes diet is:
   a. the way most Australian people eat
   b. a healthy diet for most people
   c. too high in carbohydrate for most people
   d. too high in protein for most people

2. Which of the following is highest in carbohydrate?
   a. Baked chicken
   b. Swiss cheese
   c. Baked potato
   d. Peanut butter

3. Which of the following is highest in fat?
   a. Low fat milk
   b. Orange juice
   c. Corn
   d. Honey

4. "25%" reduced fat" means:
   a. The product is healthy
   b. The product is 25% lower in fat that the usual product
   c. There is 25g of total fat per 100g of the product
   d. Suitable for people with diabetes

5. Glycosylated hemoglobin (hemoglobin A1c) is a test that is a measure of your average blood glucose level for the past:
   a. day
   b. week
   c. 6-10 weeks
   d. 6 months

6. Which is the best method for testing blood glucose?
   a. Urine testing
   b. Blood testing
   c. Both are equally good

7. What effect does unsweetened fruit juice have on blood glucose?
   a. Lowers it
   b. Raises it
   c. Has no effect

8. Which should <u>not</u> be used to treat low blood glucose?
   a. 3 hard sweets or lollies
   b. 1/2 cup orange juice
   c. 1 cup diet soft drink
   d. 1 cup skim milk

9. For a person in good control, what effect does exercise have on blood glucose?
   a. Lowers it
   b. Raises it
   c. Has no effect

10. Infection is likely to cause:
   a. an increase in blood glucose
   b. a decrease in blood glucose
   c. no change in blood glucose

11. The best way to take care of your feet is to:
   a. look at and wash them each day
   b. massage them with alcohol each day
   c. soak them for one hour each day
   d. buy shoes a size larger than usual

12. Eating foods lower in fat decreases your risk for:
   a. nerve disease
   b. kidney disease
   c. heart disease
   d. eye disease

13. Numbness and tingling may be symptoms of:
   a. kidney disease
   b. nerve disease
   c. eye disease
   d. liver disease

14. Which of the following is usually <u>not</u> associated with diabetes:
   a. vision problems
   b. kidney problems
   c. nerve problems
   d. lung problems

15. What was most concerning to you when assessing diabetes?

16. Has this health facility prepared you enough to care for diabetic patients?

17. What are some of the challenges you faced when dealing with diabetes patients?

Appendix F: Posttest

Please circle the correct answer

1. The diabetes diet is:
   a. the way most Australian people eat
   b. a healthy diet for most people
   c. too high in carbohydrate for most people
   d. too high in protein for most people

2. Which of the following is highest in carbohydrate?
   a, Baked chicken
   b. Swiss cheese
   c. Baked potato
   d. Peanut butter

3. Which of the following is highest in fat?
   a. Low fat milk
   b. Orange juice
   c. Corn
   d. Honey

4. "25%" reduced fat" means:
   a. The product is healthy
   b. The product is 25% lower in fat that the usual product
   c. There is 25g of total fat per 100g of the product
   d. Suitable for people with diabetes

5. Glycosylated hemoglobin (hemoglobin A1c) is a test that is a measure of your average blood glucose level for the past:
   a. day
   b. week
   c. 6-10 weeks
   d. 6 months

6. Which is the best method for testing blood glucose?
   a. Urine testing
   b. Blood testing
   c. Both are equally good

7. What effect does unsweetened fruit juice have on blood glucose?
   a. Lowers it
   b. Raises it
   c. Has no effect

8. Which should **not** be used to treat low blood glucose?
   a. 3 hard sweets or lollies
   b. 1/2 cup orange juice
   c. 1 cup diet soft drink
   d. 1 cup skim milk

9. For a person in good control, what effect does exercise have on blood glucose?
   a. Lowers it
   b. Raises it
   c. Has no effect

10. Infection is likely to cause:
   a. an increase in blood glucose
   b. a decrease in blood glucose
   c. no change in blood glucose

11. The best way to take care of your feet is to:
   a. look at and wash them each day
   b. massage them with alcohol each day
   c. soak them for one hour each day
   d. buy shoes a size larger than usual

12. Eating foods lower in fat decreases your risk for:
   a. nerve disease
   b. kidney disease
   c. heart disease
   d. eye disease

13. Numbness and tingling may be symptoms of:
   a. kidney disease
   b. nerve disease
   c. eye disease
   d. liver disease

14. Which of the following is usually <u>not</u> associated with diabetes:
   a. vision problems
   b. kidney problems
   c. nerve problems
   d. lung problems

15. What was most concerning to you when assessing diabetes? Has it changed after this in-service?

16. Do you have more confidence now to handle diabetes patients after this education program? Will you incorporate best practices for optimal patient care?

17. Was this education program helpful to you? Are there other ways you will like it to be improved?

Adapted from the Michigan Diabetes Research & Training Center (2015)