

Type 2 Diabetes Prevention and Management Educational Toolkit

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Abstract

Diabetes is one of the chronic diseases that are challenging to prevent and manage.

Approximately 8.3% of the United States' population has type 2 diabetes. One of the primary challenges in managing the disease entails reducing the associated financial and human costs by preventing new cases and enacting social change. Prevention and management education programs using enhanced toolkit may have positive effects on type 2 diabetes patients, who start enjoying a good quality of life, as well as positive social change in their communities and families. The purpose of this project will be to develop and evaluate a type 2 diabetes prevention and management education toolkit. The project will be guided by the Chronic Care Model. The toolkit consists of evidence-based materials for type 2 diabetes prevention and management from the American Diabetes Association and it will be reviewed by 20 nurses for their feedback and suggestions for improvement. The toolkit may increase nursing knowledge and serve as a functional guide for nurses to prevent type 2 diabetes and manage care for this patient population. The implementation of this DNP project may lead to better education of nursing staff so they can help improve self-management behaviors among patients with type 2 diabetes; thereby reducing the diseases' burden in the society.

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Section 1: Nature of the Project

Introduction

Type 2 diabetes mellitus (T2DM) is a chronic disease associated with insulin resistance and hyperglycemia. The disease is also linked to different macrovascular and microvascular complications, low quality of life, as well as reduced life expectancy (Howells, Musaddaq, McKay, & Majeed, 2016). The global prevalence of diabetes has increased rapidly over the past four decades due to an increase in obesity and the elderly population, as well as changes in ethnic composition. In 2014, the global diabetes prevalence among adults was 8.5%, and an estimated 90% of the reported cases were T2DM (Howells et al., 2016). The prevalence rate is expected to increase to 9.9% by 2030. In 2012, diabetes was associated with 1.5 million deaths while an additional 2.2 million deaths were linked to hyperglycemia. In 2014, the global expenditure on the disease was 11% of the total health budget, and this expenditure is expected to increase due to elevated levels of disease burden (Howells et al., 2016).

Diabetes is managed through different interventions including educational, psychosocial, and behavioral interventions. Diabetes self-management education (DSME) involves empowering patients with the knowledge, skills, and ability required for diabetes self-care (Powers et al., 2015). Diabetes self-management support (DSMS) refers to the support necessary for adopting and sustaining behaviors and skills required for diabetes self-management. Health care professionals contribute to this process. As such, notes that it is crucial for the health care providers to have the necessary knowledge and resources to ensure that diabetic patients receive both DSME and DSMS consistently (Lin et al., 2018; Powers et al., 2015). DSME is particularly provided by health care professionals within a practice whereas DSMS programs focus patients' health beliefs, current knowledge, and culture needs among other factors that hinder their self-

management capabilities (Powers et al., 2015). With proper training, nurses can teach evidence-based, self-management practices to type 2 diabetes patients, which will reduce the cost of diabetes, improve documentation, and improve diabetes management.

Diabetes is a threat to most U.S citizens. The American Diabetes Association (ADA) and Centers for Disease Control and Prevention (CDC) have developed numerous educational materials and activities to reduce the prevalence and incidence of type 2 diabetes. Despite all the education available, diabetes remains a significant health problem and is the seventh-leading cause of death in the United States (U.S. Department of Health and Human Services, 2018). In 2013, there were 29.1 million people in the U.S. with diabetes of which, 21 million were diagnosed (with 8.1 million undiagnosed) and 28.9 million were 20 years of age or older. The age aggregated statistics show that 4.3 million patients were 20-44 years old, 13.4 million were 45-65 years old, and 11.2 million were 65 years or older (CDC, 2014). Additionally, 15.5 million people with diabetes were men and 13.4 million were women.

When data on diabetes prevalence from 2010 to 2012 were aggregated by race and ethnicity, 7.6% of the diabetic patients were European Americans, 9% were Asian Americans, 12% were Hispanic Americans, 13.2% were African Americans, and 15.9% were Native Americans. Among the Asian American population, the CDC reported the rate of diagnosis was 4.4% for Chinese Americans, 13.8% for Asian Indians, 11.3% for Filipino Americans, and 8.8% for other Asian American populations. The diagnosis rate for Alaskan Natives was 6.0%, while the American Indians in Southern Arizona had a rate of 24.1% (CDC, 2014). The increase in the number of diabetic patients from 2010 to 2012 is an indication that diabetes is a healthcare problem that requires attention.

The key challenge in managing diabetes entails reducing the human and financial costs associated with the disease. Diabetes is associated with 15-year reduction in life span (Lin et al., 2018). Besides, diabetic patients have a high risk of developing comorbidities such as blindness, kidney failure, heart disease, diabetic ulcers, strokes, and gangrene or amputation of a lower limb (CDC, 2014; Maryniuk, Mending, Imershein, Gregory, & Jackson, 2013). Additionally, the CDC reported that in 2012, the total cost of diabetes in the U.S. (direct and indirect) was \$245 billion and direct medical expenses associated with the disease amounted to \$176 billion in 2014 whereas the indirect cost arising from work loss, disability and death amounted to \$69 billion.

The correct projection of diabetes cost and healthcare burden is important for future planning of healthcare needs and costs. Lin et al. (2018) conducted a study projecting the costs of diabetes among U.S. adults up to the year 2060. The projected number and percentage of adults diagnosed with diabetes will increase from 22.3 million (9.1%) in 2014 to 39.7 million (13.9%) in 2030. The researchers predicted that the number will rise to 60.6 million (17.9%) in 2060. Notwithstanding, the number of people with diabetes aged 65 years and above will increase from 9.2 million in 2014 to 21.0 million in 2030, and to 35.2 million in 2060. The percent prevalence will increase across all race-sex groups, with black women and men continuing to have the highest diabetes percent prevalence, and black women and women of other races having the largest relative increases. Lin et al. (2018) concluded that that by 2016, the number of U.S. adults diagnosed with diabetes was projected to triple. Such projections are important as they indicate the significance of planning health services to cater for the growing diabetes burden and plan public health programs aimed at reducing it in the future.

Problem Statement

The increased prevalence of diabetes across the globe, and particularly in the U.S. indicates there is a need to empower health care professionals and patients on diabetes care (Howells et al., 2016). The disease is associated with morbidity and mortality, micro and macrovascular damage as well as psychosocial problems (Howells et al., 2016). Notably, patients should be educated on appropriate prevention and self-management measures by healthcare providers since poor control of the disease can lead to low quality of life.

Diabetes prevention and management education is one way of empowering the population at risk for type 2 diabetes and those who already have type 2 diabetes (Powers et al., 2016). Poor self-care is associated with non-adherence with lifestyle interventions recommended for managing the disease. Research has established that healthcare providers lack sufficient knowledge on diabetes management. Consequently, they are unable to educate or empower their patients with the necessary self-management knowledge and skills leading to failure to initiate appropriate diabetes self-care (Abduelkarem & El-Shareif, 2013; Yacoub et al., 2014).

Action has been taken by healthcare providers to educate diabetic adults about preventative healthcare. Nurses and certified diabetes nurse educators are trained to provide diabetes education to the population with diabetes or those at risk for diabetes. However, one-third to one-half of the population with diabetes or at risk for diabetes never had formal diabetes education from nurses (Maryniuk et al., 2013). Additionally, nurses may not be aware of the resources available for the effective prevention and management of type 2 diabetes. This project involves development of a toolkit for type 2 diabetes prevention and management kit.

Purpose Statement

The purpose of this project is to develop a nursing toolkit based on best practices in type 2 diabetes prevention. Further, the toolkit was evaluated by nurses. Health care providers must know best practices and interventions for diabetic patients that are aimed at changing unhealthy lifestyles so they can advise the patients on how to manage the disease effectively. A toolkit to educate nurses about prediabetes and type 2 diabetes management can potentially equip them with the appropriate self-management knowledge and skills (Lavoie et al., 2013).

Project Objectives

The first objective of the DNP project will involve the development of a toolkit on T2DM to guide and help the nurses in a medical clinic office to teach their patients about the disease and self-management strategies. The second objective will be to engage nurses in the evaluation of the toolkit.

Nature of Doctoral Project

This project entails the development of a toolkit to help medical clinic office nurses teach adult patients with type 2 diabetes and their families how to prevent and manage prediabetes and type 2 diabetes. The toolkit provides a blueprint and tools that nurses can use to advance their knowledge about type 2 diabetes and apply in their daily clinical practice with adult patients who have prediabetes and type 2 diabetes.

Nurses are encouraged to embrace lifelong learning by seeking opportunities to advance their qualifications and capabilities to provide care to diverse societies. Lifelong learning entails actively seeking for knowledge and understanding through formal and in-formal learning to meet one's professional needs (Qalehsari, Khaghanizadeh, & Ebadi, 2017). Through this project, nurses get an opportunity to enhance their diabetes prevention and management knowledge. The

DNP project will enhance nurses' knowledge and confidence levels regarding their role in diabetes care.

Significance

Healthy lifestyle practices could prevent 80 to 90% of type 2 diabetes cases (Kerrison et al., 2017). In high-risk populations, the risk of progressing to type 2 diabetes could be reduced by up to 60% with lifestyle interventions aimed at a healthy diet, moderate to vigorous physical activity, and weight loss or weight maintenance (Yates et al., 2012). According to Hamasaki (2016), physical exercise enhances glycemic control and minimizes the risk of cardiovascular disease as well as mortality among diabetic patients. The researcher established that walking for at least 30 minutes daily minimizes the risk of the T2D by 50%.

Nurses have significant opportunities to improve awareness of disease prevention and management for adult patients with type 2 diabetes. Staff nurses, nurse practitioners, and certified diabetes nurse educators can use the toolkit for patients' first visit and on each follow-up visit to assess and evaluate patients' and families' knowledge related to type 2 diabetes prevention and management. Nurses play a significant role in educating patients on the trajectory of diabetes and fostering self-management (Powers et al., 2015). The toolkit developed through this DNP project may enhance nurses' and patients' knowledge and allow nurses, patients, and family members to collaborate to make healthcare decisions for diabetes prevention and management. The toolkit may enhance nurses' knowledge and confidence levels regarding their role in diabetes care and supporting diabetic patients in self-management of the condition.

Practice-Focused Question

The question for the DNP project is: After the development of a toolkit, do the nurses in the field deem the toolkit as effective?

Implication for Social Change

The development of the diabetes toolkit may lead to better education of nursing staff so they can help improve self-management behaviors among patients with type 2 diabetes. These patients are at an increased risk of developing complications like cardiovascular disease, poor circulation, kidney failure, diabetic ulcers, blindness, pulmonary tuberculosis, and disorders of lipid metabolism (Chen et al., 2016). Lack of proper diabetes self-care increases the disease burden on the patients, their family members, as well as the society in general as it elevates the expenditure associated with the disease. The toolkit may help individuals with prediabetes to engage in lifestyle modification behavior, thus creating a healthier community. Healthier lifestyles in pre-diabetic and diabetic patients can create happier and healthier families and reduce the strain on medical facilities and care costs to communities.

Proper diabetes management enhances the quality of life and the patients' well-being (Powers et al., 2015). Lifestyle interventions for type 2 diabetes are designed with a focus on behavioral and diet modification such as diet and exercise. These interventions are associated with positive outcomes such as weight reduction, reduced diabetes risk, better sleep patterns, and lowered cardiovascular risk. Besides, the interventions result in a decrease in the severity of stress and depression (Hamasaki, 2016).

Summary

Diabetes is a major health problem in the U.S. with significant human and financial costs that could be mitigated through effective disease management and prevention education. Healthcare organizations are increasingly advocating the need to implement behavioral changes that are based on evidence-based practices that will improve disease prevention and management among adults with type 2 diabetes. Medical clinic care providers play a vital role in diabetes

management by motivating, educating, and providing feedback to individuals with the disease. The purpose of this project was to develop a toolkit for medical clinic nurses so they can better teach adult patients with type 2 diabetes about prevention and management and address lifestyle modifications to prevent and manage diabetes-related complications. The next section presents the literature review and evidence-based framework underlying the diabetes management content for the toolkit.

Section 2: Background and Context

Introduction

Diabetes and its complications can be significantly delayed or prevented through simple, cost-effective interventions. The purpose of this DNP project was to develop a toolkit based on best practices in type 2 diabetes prevention and have it evaluated by nurses. This section presents the evidence-based framework underlying the diabetes prevention and management program in the medical clinic setting and its relevance to nursing. The section also reviews literature on diabetes and diabetes management as well as education. A search of the literature on diabetes education and prevention strategies was conducted using the electronic databases such as CINAHL, Ovid Plus, ERIC, and PubMed databases in addition to the Cochrane Library, Google Scholar, and the ADA and CDC websites. The keywords used to query the databases included *type 2 diabetes, pre-diabetes, healthcare professionals, practice nurses, medical clinic office, diabetes prevention, diabetes knowledge, lifestyle modification, diabetes belief, adherence and compliance to lifestyle interventions, diabetic diet, and self-efficacy*. The articles selected specifically addressed the knowledge of healthcare experts regarding diabetes prevention and education, population beliefs about diabetes, lifestyle modification, and the burden of diabetes. The search was limited to articles published in English between 2015 and 2020. Evidence-based practice should be current hence, it was important to use sources published within the last five years. A total of 31 relevant articles were obtained for the review as indicated in the PRIMA diagram below.

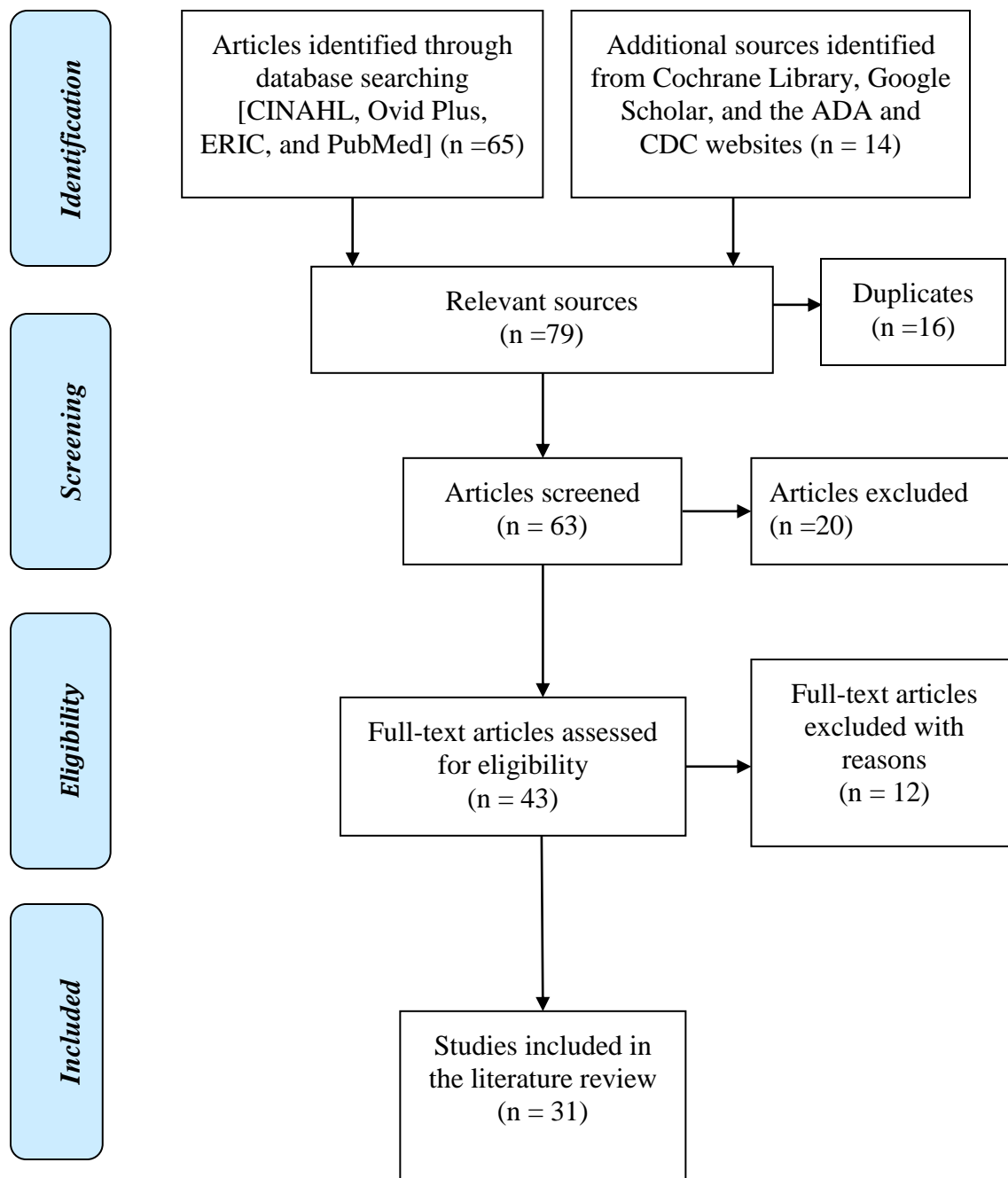


Figure 1. PRISMA diagram

The literature review focused on studies that support the benefits of diabetes education and monitoring labs using a toolkit for type 2 diabetes prevention and management in clinical settings. The literature review also addressed studies exploring the impact of diabetes education

and social support in education programs and interventions, the effectiveness of type 2 diabetes lifestyle interventions, and factors influencing patient adherence to medication and treatment regimens.

Review of Literature

Diabetes Education, Family, and Social Support

Diabetes self-management training and education plays a significant role in improving management of the disease. The training ensures that diabetic patients are aware of the nature, treatment, risk factors, and the complications associated with the disease and the measures for alleviating them. Diabetes self-management education does not only involve relaying information, but also encompass dynamic, holistic, and patient-centered approach (Kosti & Kanakari, 2012). Education promotes self-management as well as health-related behavioral modification. However, diabetes education should align with the patients' learning capabilities and psychosocial state, and should be enhanced to improve the patients' understanding of the importance of check-up and follow-up (Kosti & Kanakari, 2012).

Nazar et al. (2016) investigated the effectiveness of diabetes education in the United Kingdom. The researchers' key objective was to assess the role of knowledge and awareness of diabetes in combating the disease. Nazar et al. (2016) conducted a systematic review of available evidence on effectiveness of diabetes education. The findings indicated that there are various diabetes education programs in the UK such as Dose Adjustment for Normal Eating (DAFNE), Diabetes Education and Self-Management for Ongoing and Newly Diagnosed (DESMOND) and X-PERT Diabetes Program. The programs are developed to empower diabetic patients to manage their conditions. The findings further indicated that the education programs can

minimize the risk factors as well as the chances for developing diabetes complications leading to reduced morbidity and mortality.

Ehrmann et al. (2016) compared the effectiveness of diabetes education program for Type 1 Diabetes (PRIMAS) in a randomized controlled trial setting and routine care setting. The experimental group contained 75 patients whereas the control had 179 patients. The evaluation focused on improvement of HbA1c, hypoglycemia challenges, and diabetes-related distress at the baseline and 6-month follow-up. The findings indicated that the patients in the both groups had a significant longer diabetes duration (18.7 ± 12.3 vs. 13.8 ± 12.7 yrs., $p = .005$), lower self-efficacy scores (21.9 ± 4.7 vs. 23.7 ± 6.1 , $p = .02$) and more diabetes complications (0.8 ± 1.3 vs. 0.4 ± 0.9 , $p = .02$) (Ehrmann et al., 2016). PRIMAS led to considerable improvements in HbA1c ($-0.36\% \pm 1.1$ vs. -0.37 ± 1.2 ; $\Delta -0.01$, 95% CI -0.33 to 0.31) as well as hypoglycemia unawareness (-0.5 ± 1.4 vs. -0.3 ± 1.4 ; $\Delta 0.18$, 95% CI -0.21 to 0.57) (Ehrmann et al., 2016). The researchers concluded that diabetes education of PRIMAS was effective in both RCT and routine care settings.

Social support is defined as the exchange of valuable resources between family members, partners, friends, and nurses to provide a caring, loving, encouraging, motivating, and teaching environment for patients who need support in the medical clinic (Kirk et al., 2013). Wagner, Tennen, Feinn, and Osborn (2015) conducted a study to investigate whether self-reported racial discrimination was associated with continuous glucose levels and variability in individuals with diabetes, and whether diabetes distress mediated these associations. Seventy-four Black and White women with type 2 diabetes completed the Experience of Discrimination Scale, a measure of lifetime racial discrimination, and the problem areas in diabetes, a measure of diabetes distress. Participants wore a continuous glucose monitor for 24 h after 8 h of fasting, a

standard meal, and a 4-h run in period. Higher discrimination predicted higher continuous mean glucose and higher standard deviation of glucose. For both mean and standard deviation of glucose, race and discrimination interaction indicated a stronger relationship between discrimination and glucose for Whites than for Blacks. Diabetes distress mediated the discrimination–mean glucose relationship. Whites who report discrimination may be uniquely sensitive to distress. These preliminary findings suggest that racial discrimination adversely affects glucose control in women with diabetes, and does so indirectly through diabetes distress. Diabetes distress may be an important therapeutic target to reduce the ill effects of racial discrimination in persons with diabetes.

Lee, Piette, Heisler, and Rosland (2018) conducted a study to examine whether autonomy support (defined as social support for an individual’s personal agency) for diabetes management from informal health supporters (family/friends) reduces the detrimental effects of diabetes distress on glycemic control. In this study, three hundred and eight veterans with type 2 diabetes and one or more risk factors for diabetes complications completed a survey that included measures of diabetes distress and perceived autonomy support from their main informal health supporter. Hemoglobin A_{1c} (HbA_{1c}) data from 12 months before and after the survey were extracted from electronic medical records. Linear mixed modeling examined the main effects and interaction of autonomy support and diabetes distress on repeated measures of HbA_{1c} over the 12 months after the survey, controlling for mean prior 12-month HbA_{1c}, time, insulin use, age, and race/ethnicity. Lee et al. (2018) established that diabetes distress ($B = 0.12$ [SE 0.05]; $P = 0.023$) was associated with higher and autonomy support ($B = -0.16$ [SE 0.07]; $P = 0.032$), and lower subsequent HbA_{1c} levels. Autonomy support moderated the relationship between diabetes distress and HbA_{1c} ($B = -0.13$ [SE 0.06]; $P = 0.027$). Greater diabetes distress

was associated with higher HbA_{1c} at low ($B = 0.21$ [SE 0.07]; $P = 0.002$), but not high ($B = 0.01$ [SE 0.07]; $P = 0.890$) autonomy support. Lee et al. (2018) concluded that autonomy support from main health supporters may contribute to better glycemic control by ameliorating the effects of diabetes distress. Interventions that reduce diabetes distress and enhance the autonomy supportiveness of informal supporters may be effective approaches to improving glycemic control.

Vaccaro, Exebio, Zarini, and Huffman (2014) investigated how ethnicity, perceived family/friend social support (FSS), and health behaviors are associated with diabetes self-management (DSM) in minorities. The participants were recruited through community outreach methods and included 174 Cuban-Americans, 121 Haitian-Americans, and 110 African-Americans with type 2 diabetes. The results indicated that ethnicity and FSS were associated with DSM. Higher FSS scores were associated with higher DSM scores, independent of ethnicity. There were ethnic differences in several elements of FSS. DSM was highest in Haitian-Americans as compared to African-Americans; yet Haitian-Americans had poorer glycemic control. The findings suggested that FSS together with ethnicity may influence critical health practices. Based on these findings, there is a great need for more studies to further investigate the relationships among minorities with diabetes, their intimate network (family and friends) and the diabetes care process.

Effectiveness of Lifestyle Interventions

Lifestyle modification with weight control, moderate exercise, and dietary changes can decrease type 2 diabetes. Physical activity and nutrition for diabetes in Alberta (PANDA) menu plan is one of the lifestyle interventions that have been adopted to improve diabetes management among patients in Canada. The menu plan focuses on recipes and foods that are readily available

and acceptable (Asaad, Soria-Contreras, Bell, & Chan, 2016). Asaad et al. (2016) conducted a single-arm, pre-post intervention study to determine the effectiveness of the PANDA menu plan on blood glucose control and dietary adherence and quality among type 2 diabetes patients. The study was conducted among 73 patients who were taken through interactive education on Canadian Diabetes Association (CDA) nutrition therapy guidelines. Post-intervention follow-up was done after three and six months. The findings indicated positive changes in A1c (-0.7%), body mass index (BMI, -0.6kg/ m^2), and diastolic blood pressure (-4mmHg), as well as total cholesterol (-63 mg/dL) (Asaad et al., 2016). Additionally, positive changes were noted in HDL (+28 mg/dL) and LDL cholesterol (-89 mg/dL), health eating index (+2.1 score), as well as the perceived dietary adherence (+8.5 score) at 0.05 significance level (Asaad et al., 2016). These improvements were maintained at six months demonstrating the intervention's effectiveness in facilitating glycemic control and diet quality. The findings further indicated that dietary intervention including interactive education sessions is effective in improving diabetes management.

In another study, Ndwiga, MacMillan, McBride, and Simmons (2018) conducted a meta-analysis of available evidence to demonstrate that lifestyle interventions can be used to reduce diabetes incidence and complications among Polynesian people. The researchers reviewed eight studies: four RCTs and four pre-post studies with 1590 participants. The studies focused on health outcomes such as systolic blood pressure (SBP), body mass index, weight, waist circumference, and glycated hemoglobin. The meta-analysis showed that the lifestyle interventions led to statistically significant reductions in blood pressure. Additionally, the interventions led to reductions in weight and glycated hemoglobin though the changes were not

statistically significant. Ndwigwa et al. (2018) also noted that lifestyle interventions led to modest reductions in SBP among the patients.

Kerrison et al. (2017) adopted a systematic review approach to investigate the effectiveness of lifestyle adaptation on prevention of pre-diabetes among adults. The researchers focused on the effect of exercise and dietary intervention on glycemic control and incidence of type 2 diabetes mellitus (T2DM). The secondary outcomes in the study included body mass index, weight change, and physical exercise capacity after the intervention. Kerrison et al. (2017) identified a sample of 1,780 studies out of which nine met the inclusion criteria. The findings indicated that lifestyle adaptation minimizes the incidence of diabetes development. Additionally, the intervention enhanced glycemic control, improved physical exercise capacity, and amplified weight reduction.

In another study, Fianu et al. (2016) explored the effectiveness of a lifestyle intervention in preventing Type 2 diabetes in Reunion Island. The study focused on body weight and waist circumference among obese adults who were at high-risk of developing the disease. The experimental study was conducted among 445 adults categorized into the intervention and the control group. The intervention involved a healthy diet, physical exercise, as well as improved living conditions. The results indicated a significant reduction in adiposity, body weight loss, BMI reduction, and waist circumference reduction in the intervention group.

Howells et al. (2016) evaluated the clinical impact of lifestyle interventions adopted to prevent diabetes. The researchers assessed systematic reviews of studies conducted among adults at high risk of diabetes. The interventions adopted in the systematic reviews ranged from dietary and physical activity interventions and the primary measures included glycaemia, and diabetes incidence whereas the secondary measures were behavior change, adiposity, vascular disease,

and mortality. Howells et al. (2016) identified 19 reviews for inclusion in the study, most of which only focused on randomized control trials. The findings of most of the reviews indicated that lifestyle interventions were linked with a reduction in diabetes incidence as well as measures of glycaemia and adiposity. However, Howells et al. (2016) noted that the studies infrequently reported the effects of such interventions on behavior change, vascular disease, and mortality leading to minimal evidence for the secondary outcomes.

Lavoie et al. (2013) conducted interviews with 34 providers and 29 patients who were engaged in group medical appointment (GMAs). They used a cross-sectional design that included a sample of 29 adult patients who had type 2 diabetes. This study showed that the GMA approach is an alternative for diabetes care that reflects ideal patient-centered care. This study's main finding was that patients form voluntary relationships of care with their providers, which facilitate respect and enable autonomy, accountability, fidelity, and humanity.

Factors Influencing Medication/Treatment Regimen Adherence

Kassahun (2016) conducted a study to assess non-adherence and factors affecting adherence of diabetic patients to anti-diabetic medication in Assela General Hospital (AGH), Oromia Region, Ethiopia. Among the respondents, 149 (52.3%) and 136 (47.7%) were female and male, respectively. The majority of the study participants 189 (66.3%) were in the age group of 30–60 years. Two-hundred nineteen (76.8%) of respondents were married currently. The majority, 237 (83.2%) of respondents did not have blood glucose self-monitoring equipment (glucometer). A total of 196 (68.8%) respondents adhered to anti-diabetic medication. There was a significant association between adherence to the medication and side effects, level of education, monthly income, and presence of glucometer at home ($P < 0.05$). Kassahun et al. (2016) concluded that the participants in the area of study were moderately adherent to their anti-

diabetic medications with a non-adherence rate of 31.2%. Different factors of medication non-adherence were identified such as side effects and complexity of regimen, failure to remember, and socio-demographic factors such as educational level and monthly income.

Gonzalez, Tanenbaum, and Commissariat (2016) explored the psychosocial factors influencing medication adherence and diabetes self-management. The researchers emphasized that health behaviors including medication adherence, diet, physical activity, as well as blood glucose self-monitoring are crucial towards attaining optimal glycemic control. However, most patients experience challenges attaining recommended standards for diabetes management. Gonzalez et al. (2016) argued that diabetes self-management is influenced by factors in three broad domains including knowledge, beliefs, and related cognitive constructs, emotional distress and wellbeing, as well as behavioral skills and coping. Diabetes self-management requires robust health literacy skills and an understanding of the effects of the disease on the body, the treatment goals, and the impacts of different behaviors on glucose regulation. Self-management is influenced by factors relating to emotional distress and well-being such as depressive symptoms, fear of hypoglycemia, optimism, self-esteem, and sense of purpose (Gonzalez et al., 2016). Additionally, the researchers emphasized that family-context and social relationship factors also determine the effectiveness of self-management. The researchers recommend continued emphasis on research to improving psychosocial aspects of living with diabetes, with greater attention to the situational context in which the self-regulatory processes underlying self-management occur.

Sweileh et al. (2014) conducted a study that focused on the serious health problems associated with diabetes and medication non-adherence. The main goal of the study was to improve medication adherence among adult patients with type 2 diabetes. Sweileh et al. (2014)

interviewed 405 patients diagnosed with type 2 diabetes using the eight-item Morisky Medication Adherence Scale and found 42.7% of the participants were considered non-adherent to their medication regimen. As a result of the study, participants showed significant improvement in awareness about their medications and knowledge about their illness which was displayed as a positive change in their medication adherence.

To address the challenge and gap in the management of T2DM, stakeholders have, proposed, enacted, and evaluated a number of interventions. For instance, Chrvala, Sherr, and Lipman (2018) conducted a study to implement and evaluate the short-term effectiveness of a diabetes self-management education intervention on diabetes-related knowledge and accepted behavioral changes to decrease risk for complications. The education intervention was intended to enhance diabetes-related knowledge and self-management behaviors. A convenience sample of 15 patients with T2DM was used pre and post analysis was conducted to evaluate its effect. The findings showed that there was an increase in the patients' knowledge level increased.

Similarly, Emokidi (2020) undertook a study to identify patients' concerns related T2DM and to develop an education program for providers to address these concerns. The study involved five providers who conducted assessments during a primary care visit or 22 patients diagnosed with T2DM. The findings showed that there were concerns on diet, exercise, medication, taking shots, blood sugar checks, comprehending diabetes, follow-up appointments, depression, requiring a new insulin pump and the need for lifestyle change. Consequently, an education program was developed and delivered to the 5 providers to address the raised concerns. All practitioners agreed or strongly agreed that the education program provided information they could use to educate and support their T2DM patients.

Given the importance of staff in management of T2DM, Williams (2020) sought to develop staff Education on the same. After a review of the literature an evidence-based education program was developed that covered the current standards of care for T2DM. A posttest analysis showed that the staff education significantly increased staff knowledge. The knowledge led to effective management of positive social change may result when staff are knowledgeable of T2DM where staff can provide informed support to patients and family and in so doing enable patients to lead healthier lifestyles.

In their study Moura et al (2019) sought to evaluate the effect of educational intervention in the adherence to self-care activities and functional health literacy and numeracy in people with T2DM. The researchers conducted a quasi-experimental where the interventions were delivered in three weekly meetings lasting 60 minutes on average. The findings showed that educational interventions had a positive effect on adherence to self-care and functional literacy in health. Further Bene et al (2019) found that mobile health applications on self-management in patients T2DM. The mobile health applications efficiently deliver knowledge on healthy eating, blood sugar monitoring, physical activity, good problem-solving skills, risk-reduction behaviors, healthy coping skills and medication adherence.

Concepts, Models, and Theories

This evidence-based project will be guided by the Chronic Care Model (CCM) developed by Wagner in 2001. The model was developed as a means of introducing comprehensive strategies for managing chronic diseases and improving care delivery for such diseases (Davy et al., 2015). The model utilizes a systematic approach towards restricting medical care to establish partnerships between health systems and communities (Stellefson, Dipnarine, & Stopka, 2013). CCM has been designed to build on the inter-relationships between six evidence-based pillars

that lead to improved clinical quality and outcomes regarding disease management. It has also improved care in health systems at the community, organizational, primary care, practice, and patient levels (Wagner, Austin, Schaefer, & Bonomi, 2001).

The six pillars of CCM include first; healthcare system/organization, which creates a culture to promote safe, high quality of care. The second pillar is the delivery system design, which ensures efficient clinical care and self- management support. The third pillar is decision support, which fosters clinical care with consistent scientific evidence and patient preferences. The fourth pillar is clinical information systems, which facilitate access to patient and population data to cultivate improvement of efficient and effective patient care. The fifth pillar is community resources and policies, which activate various resources to meet patients' needs. The sixth pillar is self-management support, which is essential to empower patients with chronic disease to effectively manage their healthcare needs (Zhang, Van Leuven, & Neidlinger, 2012). CCM has been used for diabetes care in U.S. primary care settings with positive patient outcomes such as decreased HGB A1C levels (Stellefson et al., 2013). All six pillars of the CCM will be applied to this project to create a diabetic care toolkit for nursing staff.

Pillar One: Healthcare System and Organization

The healthcare system must identify methods that have been used to improve quality and access to care. The advanced practice nurse (APN) provides leadership and education on diabetes which builds patients' confidence in their understanding of the disease process. It is a priority for the APN to intervene with patients at risk for developing type 2 diabetes complications by providing education to improve clinical and behavioral outcomes. According to Stellefson et al. (2013), a systemic review indicated that healthcare systems in support of the CCM approach found positive benefits associated with improved foot care and HGB A1C reductions of at least

1% during a 12-month period. The researchers also found positive changes associated with improved blood pressure, cholesterol levels, weight reduction, and body mass index (BMI) reduction.

Pillar Two: Delivery System Design

A delivery system design is intended to facilitate skill-based learning for nursing staff so they can effectively educate diabetic patients about glycerin and hemoglobin A1C monitoring as well as nutrition and lifestyle changes. This step involves coordination of care, which includes recommendations for eye care, foot care, nutritional counseling, and follow-up recommendations. Each patient is encouraged to take control of his or her diabetes and learn self-management skills. Healthcare providers should focus on providing optimal care of diabetes through management of complications. This is accomplished by addressing barriers to care such as lack of knowledge and awareness of services available for diabetes (Stellefson et al., 2013).

Pillar Three: Decision Support

Decision support provides guidance for implementing comprehensive, evidence-based care. This pillar covers education on risk factors; regular follow-up with primary providers; and information about risk factors and identifying barriers (Stellefson et al., 2013). The toolkit provides comprehensive information for nurses to integrate evidence-based diabetes care guidelines into clinical practice.

Pillar Four: Clinical Information Systems

A clinical information system tracks progress through reporting outcomes to patients and providers. Stellefson et al. (2013) claimed that clinical information systems using disease process registries and Electronic Medical Records (EMRs) can help patients and providers set self-

management goals and review progress reports to determine whether patients met their goals. This pillar is accomplished through a recommendation of the strategies for evaluating the toolkit.

Pillar Five: Community Resources and Policies

Community resources include a variety of services and resources that are available within an organization. Nurses will gain comprehensive information about effective services in the community such as relevant agencies and cost-effective services for patients, nutritional counseling, and peer support groups (Stellefson et al., 2013). Upon completion of the toolkit, nurses can refer patients to community resources that offer different services such as eye care, foot care, and patient assistance programs essential for diabetic patients.

Pillar Six: Self-Management Support

Evidence indicates that nursing staff should emphasize patient empowerment and the acquisition of self-management skills because they are effective in diabetes care (Wagner et al., 2001). Nurses who are properly educated about type 2 diabetes can educate and work with patients on issues such as medication compliance, foot care, diabetic diet and exercise, interpretation of laboratory results, and goal setting for better healthcare outcomes. A review of literature indicated diabetes self-management education can generally improve psychosocial and clinical outcomes in patients with pre-diabetes, diabetes, and disease progression (Stellefson et al., 2013).

Strengths and Limitations of the CCM

CCM is an evidence-based guideline and a synthesis of system changes to guide quality improvement (Wagner et al., 2001). The model is associated with several strengths including facilitation of community and family support to meet the needs of patients, improvement of health systems, delivery system design, and clinical information systems to meet the needs of

both health care providers and patients, as well as enhanced health care professional case management to meet patients' needs (Davy et al., 2015). Additionally, the model promotes effective delivery of care, facilitates self-management of care, and provides evidence-based tools and techniques for care provision while controlling costs and resources. Besides, the model promotes implementation of systems for improving quality of life for individual patients and populations. A limitation of the model may be that it has only been utilized in healthcare since 2001, compared with other theoretical models that have been utilized and tested for decades.

Due to the impact of chronic illnesses on the healthcare system, researchers should explore additional comprehensive diabetes education strategies using CCM to improve patient satisfaction and patient outcomes. CCM is ideally equipped to handle education about chronic illnesses because it has "provided guidance regarding chronic illness such as diabetes as well as a systematic approach to improve care" (Wagner et al., 2001, pp. 64-78). Stuckey, Adelman, and Gabbay (2011) noted that the model has been most effective in translating evidence-based recommendations into clinical practice, particularly in relation to diabetes management both in the U.S. and internationally. CCM is particularly suitable for this project as it hypothesizes "that the productive interactions of a prepared proactive practice team and an informed empowered patient and family lead to improved outcomes" (Stuckey et al., 2011 p. 49). The diabetes prevention and management education program will impart essential knowledge to the participating nurses who will be in a position to empower their patients leading to improved health outcomes.

Relevance to Nursing Practice

Nurses play a significant role in patient education, which is perceived as one of the means of promoting health. Health education entails creating awareness among patients on diverse

issues as a way of preventing diseases and improving well-being. Diabetes self-management education is a collaborative process through which diabetic patients acquire the knowledge and skills required to modify their behavior and manage the disease (Burke, Sherr, & Lipman, 2014). Kemppainen, Tossavainen, and Turunen (2013) emphasized that nursing practitioners should adopt practical actions to promote health through the use of a holistic or patient-centered approach. Notably, nurses should utilize the available opportunities to educate diabetic patients about the disease, the risk factors, and the self-management interventions.

As integral stakeholders in the healthcare system, nurses are concerned by issues affecting the health care sector such as high costs. Nurses can contribute towards reducing hospital admissions and readmissions by educating patients about diabetes self-management. Patient education leads to a reduction in estimated lifetime health care costs due to a lower risk for complications. The cost of diabetes in the U.S. was \$245 billion in 2012, and patient education provides an opportunity for minimizing the costs (Powers et al., 2015). Projections indicate that one in three persons will develop type 2 diabetes by 2050. Diabetes costs will overwhelm the country's health care system creating the need to reduce the incidence rates and diabetes-related complications.

Local Background and Context

Diabetes threatens the health of many people living in the U.S. (ADA, 2011; CDC, 2014). Although the ADA (2011) and CDC (2014) have developed numerous educational materials and activities to decrease the prevalence and incidence of type 2 diabetes, diabetes is still a significant health problem. Not only is the disease the seventh leading cause of death in the U.S. (U.S. Department of Health and Human Services, 2018), it is associated with an estimated

15-year reduction in lifespan and a high risk of developing stroke, heart disease, blindness, kidney failure, gangrene, and lower-limb amputations (CDC, 2014).

The prevalence of diabetes varies by gender and ethnic group, but also varies by education level and geographic location. The prevalence of the disease is higher in individuals without high school education compared to those who have attended high school or tertiary education. Geographically, the prevalence of diabetes in 1994 was 4.5% in 25 states, 4.5% to 6.0% in 24 states, and over 6.0% in one state; however, in 2010, all states had a prevalence of diabetes over 6.0%, and 15 states exceeded 9.0% (CDC, 2014). The CDC also revealed that Mississippi had the highest rate of diagnosed diabetes at 11.3%, followed by Alabama at 11.1%. The lowest rate of diagnosed diabetes was in Vermont at 5.8%, followed by Montana and Minnesota at 6.2%, respectively. The distribution of diabetes across the states also showed an increase in the prevalence of diabetes, especially in the southeast. The medical clinic of interest in this project provides care to approximately 3,150 patients who are part of an underserved community and 8% of those patients are diabetic, annually.

Nurses have the same responsibility in providing care to diabetic patients whether in an inpatient or outpatient care setting. Healthcare facilities depend on nurses to provide diabetes education to individuals at risk for type 2 diabetes or pre-diabetes. However, Abduelkarem and El-Shareif (2013) posited that nurses lack sufficient diabetes management skills, particularly on insulin therapy. The researchers maintain there is a need for advancing general diabetes knowledge among nurses in hospital settings. Empowering nurses with this knowledge would enable them to convey accurate information to diabetic patients.

Yacoub et al. (2014) conducted a study to assess the level of Jordanian nurses' perceived and actual knowledge of diabetes and examined the relationship between nurses' actual

knowledge of diabetes and their different characteristics. A total of 277 out of the 450 eligible registered nurses accepted to participate and returned questionnaires from seven hospitals in Jordan. Nurses in this study mostly demonstrated a knowledge deficit in clinical and theoretical-based topics, such as initial treatment of hypoglycemia, insulin storage and preparation, meal planning, and duration of action with hypoglycemic agents. Nurses' actual knowledge of diabetes was positively correlated with their perceived knowledge, perceived competence, and level of education. The researchers concluded that a knowledge deficit regarding diabetes was demonstrated by the nurses. The role of continuing education is essential to supporting nurses' knowledge of complex clinical conditions, such as diabetes. Adequate implementation and dissemination of evidence-based guidelines on caring for people with diabetes is a prerequisite to improve the nurses' knowledge.

Carney, Stein, and Quinlan (2013) examined nurses' perceived and actual knowledge of diabetes. A total of 245 nurses completed a structured questionnaire measuring their experience, perception of diabetes, and diabetes knowledge. The researchers established a need to enhance the nurses' and nursing students' nutritional knowledge in relation to diabetes management. Nurses are not registered dietitians, but they should maintain basic knowledge of diabetes nutrition to care for patients with diabetes.

Young-Hyman et al. (2016) conducted a needs assessment to determine nurses' knowledge of diabetes care and found a gap between staff nurses' perceived knowledge and their actual knowledge of diabetes mellitus. Alotaibi, Gholizadeh, Al-Ganmi, and Perry (2018) explored the factors nurses perceive as influencing their knowledge acquisition in relation to diabetes care and its management in Saudi Arabia. Three main themes emerged: (a) diabetes care and education, (b) barriers affecting nurses' acquisition of diabetes knowledge and (c) factors to

support nurses' acquisition of diabetes knowledge (Alotaibi et al., 2018). The researchers concluded that to pursue the goal of continued improvement in diabetes management in the challenging settings of acute care, there is a need to develop good practice in diabetes care among nursing professionals. Understanding of the complexity of factors that influence nurses' knowledge acquisition in relation to diabetes care and its management provides clinical nurses and nursing managers with directions for future education, policy development, and research (Alotaibi et al., 2018).

According to Powers et al. (2015), some of the mental health nurses' felt that they did not receive appropriate diabetes care training and a majority hold the belief that they need further training in diabetes care. For this reason, nurses working with populations at increased risk for diabetes or type 2 diabetes must be equipped with the knowledge of providing evidence-based diabetes prevention education to the population (Powers et al., 2015).

Nurses must also be knowledgeable about current evidence-based practices and resources to provide competent, effective, and culturally sensitive education. American Diabetes Association (2016) emphasized the importance of adapting programs to meet the educational needs of specific healthcare providers, arguing that nurses and medical clinic staff must be knowledgeable about current evidence-based practices and resources to provide competent, effective, and culturally sensitive education on type 2 diabetes. Chiang, Kirkman, Laffel, and Peters (2014) asserted that the high prevalence, increased complication, and poor outcomes of diabetes among African Americans and Hispanic Americans is a result of a lack of culturally sensitive and population-specific intervention by healthcare providers as well as a lack of knowledge about the disease process and treatment regime specific to African Americans and Hispanic Americans. Tovar and Clark (2015) examined these populations' beliefs and

knowledge about diabetes and found that participants did not consider exercise, weight control, and physical activity as factors that could influence diabetes. The researchers also found that participants lacked knowledge regarding the cure for diabetes and suggested the lack of knowledge about the causes and treatment of diabetes contributes to poor health outcomes.

Role of the DNP Student

During the clinical nursing experience, I questioned diabetes patients about their type 2 diabetes care and some of them had little to say or did not know about their diabetic treatment, which further highlighted the lack of awareness among them. I conducted tests from which I found that both patients and staff lacked knowledge of type 2 diabetes prevention and management. This discovery emphasized the need to develop a toolkit for nurses to improve their knowledge about type 2 diabetes so that they can be in a better position to educate the patients who visit medical clinic office with pre-diabetes and type 2 diabetes. My main area of interest is the use of EBPs to make decisions about effective pre-diabetes to type 2 diabetes treatment and education.

There is a need to create a type 2 diabetes toolkit, choose an assessment, and have the toolkit evaluated by nurses. If the toolkit is accepted and used in the future at this medical clinic office, the organization will be supported in the implementation of the planned staff education program. Efforts will be made to ensure that nurses are working closely with patients as diabetic champions and participating in continue education or training to improve their knowledge of pre-diabetes and type 2 diabetes so they can better serve their patients.

Definition of Terms

Diabetes: A group of metabolic disorders in which the level of blood sugar is high, which is a result of inadequate insulin production or body cells do not respond properly to insulin, or both (Asmat, Abad, & Ismail, 2016).

Diabetes self-management education (DSME). This is the process of empowering diabetic patients with information aimed at improving their knowledge, attitudes, self-efficacy, and decision making leading to healthy behaviors and improved clinical outcomes (Sherifali, Berard, Gucciardi, MacDonald, & MacNeill, 2018).

Diabetes self-management support (DSMS). This involves sustained efforts to help diabetic patients to maintain effective self-management throughout their lifetime (Piatt, Rodgers, Xue, & Zgibor, 2018).

Insulin: A hormone produced by the pancreases that allows the body to utilize glucose for energy (Craft & Rhoads, 2016).

Prediabetes: If an individual has pre-diabetes, this means that his or her blood sugar level is higher than normal but not yet high enough to be type 2 diabetes (Bansal, 2015).

Type 2 diabetes: This is a disorder in the body that causes the level of blood sugar to rise beyond normal levels. If an individual has type 2 diabetes, this means that his or her body does not utilize insulin properly (Chatterjee, Khunti, & Davies, 2017).

Assumptions and Limitations

The primary limitation is that toolkit will only be developed, but will not be used by nurses at this time. There are multiple assumptions related to the toolkit. First, it is assumed that the clinic staff may accept and value the program and apply the acquired knowledge on diabetic patients. Next, it is assumed patients who visit the clinic may accept the self-management

recommendations from nurses and make lifestyle modifications to prevent or manage diabetes. Finally, it is assumed these nurses evaluated the toolkit correctly and honestly.

Summary

The literature review has indicated that type 2 diabetes can be prevented and managed with lifestyle modification. Unsuccessful type 2 diabetes management has been attributed to a knowledge deficit about management for populations with prediabetes and type 2 diabetes. The literature further indicates that educating nurses about diabetes and self-management can improve patient outcomes since the nurses would be able to empower their patients with the acquired knowledge (Kosti & Kanakari, 2012; Nazar et al., 2016). Developing a toolkit for diabetes self-management based on CCM can ensure that nurses and patients are empowered to manage the disease. The next section presents the project design and methods, the target population, intervention outline, and evaluation plan.

Section 3: Collection and Analysis of Evidence

Introduction

The purpose of this DNP project will be to develop a nursing toolkit based on best practices in type-2 diabetes prevention and care and have the toolkit evaluated by the nurses. Using the results of a 2015 needs assessment of the project setting, the DNP student found a high number of patients with pre-diabetes converted to type-2 diabetes. Clinic staff had no specific intervention or practice protocol aimed at decreasing type-2 diabetes in adult patients. A discussion with the clinic medical director revealed the need to develop an implementation and evaluation plan for type 2 diabetes management education with the goal of decreasing the number of patients who develop type-2 diabetes. The clinic nurses may use the toolkit when educating patients with type 2 diabetes. This section covers the practice-focused question, sources of evidence, and analysis and synthesis.

The initial step in planning the development of the educational intervention (toolkit) will include gathering the learning material and constructing objectives to be used for the toolkit (See Appendix A for the sample outline for the toolkit). Staff education is often used to help inform and improve knowledge and skills relating to the best clinical practice. The primary key stakeholders will be the nurses, clinical nursing director, nursing manager in the medical clinic office, and the evaluation team, which consists of the clinic administrators and staff who may review the plan and provide input for the development of a toolkit. The DNP student was responsible for the step-by-step planning of the project, including the evaluation plan and gathering best practices information from multiple sources, creating the toolkit, presenting it to the evaluation team, and making the necessary revisions. The information was appropriate for the patients' age, literacy level, education, and language skills. Patient educational materials was

written at the sixth to eighth grade reading levels. The nurses avoided the use of medical terminology or jargon. Printed and audiovisual materials will be useful due to the patients' short clinic visits which limit the time for teaching. Printed materials are useful for reinforcing information provided to patients while in the medical clinic office and serve as a ready resource. Printed materials provide an important reminder of key points after patients go home. Families, which include any people who play an important role in the patient's life, must be included in discussions and demonstrations.

The toolkit (Appendix A) present a description of type 2 diabetes and the risk factors associated with the disease. The toolkit further outlines evidence-based practices for preventing the disease and the importance of preventing or delaying the disease.

Practice-Focused Question

The question for the DNP project is: After the development of a toolkit, do the nurses in the field deem the toolkit as effective?

Sources of Evidence

Population and Sampling

This evidence-based DNP project will target nurses working in a family clinic located in South Central California and that has served vulnerable populations since 2007. The type 2 diabetes toolkit was reviewed by a convenience sample of 20 nurses. The nurses will include nurse educators and registered nurses with expansive knowledge and experience on diabetes.

Data Collection

The DNP student will communicate with the nurses in person to invite them to participate in evaluation of the toolkit. An invitational letter will be given to the potential participant. DNP student will hand deliver the surveys and the toolkit to the nurses and then come back in a one

week to collect feedback from the nurses who may have reviewed the toolkit developed through the project. The nurses will be instructed to put their completed surveys in a sealed envelope at a designated place in nursing conference room. There will be a total of 20 nurses who will review the toolkit and offered input for improvement. Data collection will be achieved using a five-point Likert scale questionnaire which also contained two-open questions which enabled the nurses to provide feedback in narrative form (Appendix B).

Protection of the Human Subjects

The DNP student will seek approval from University's Institutional Review Board before collecting data from the nurses who reviewed the toolkit. The project is educational as it will follow University's DNP Manual for staff Education. The DNP student will seek the permission of the clinic's management before implementing the project at the facility. The nurses' confidentiality and privacy will be protected since identifiers such as names will not be required for the project purposes.

Analysis and Synthesis

Data Analysis

The evaluation data from the nurses will be analyzed through descriptive statistics to determine if the toolkit is effective. The evaluation data will be analyzed through frequencies and percentages to determine how the nurses rated the toolkit. The analysis will be achieved through Microsoft Excel. The evaluation results will be presented through the use of tables and graphs.

Evaluation Plan

The educational module toolkit will be reviewed by the nurses to determine whether it provided nurses with diabetes-related knowledge so that they can pass the knowledge to their patients. The evaluation will also determine whether the tool may be used in future studies on

diabetes knowledge and self-management. The evaluation will highlight the strengths and weaknesses of the toolkit and how it will contribute to nursing practice.

Outcome Evaluation

The toolkit will be reviewed by the nurses who will comment on the content and give recommendations with regards to the additional content that should be integrated into kit. The project consists of two plans: (1) the development of the toolkit, and (2) the assessment and feedback of the toolkit by the 20 nurses. Evaluation of this project will be necessary to assess the strength and weakness of the educational toolkit and its benefit to nursing practice. The DNP student will evaluate the project by interpreting the results and determines the applicability of results for the organization and for the patients' social change. Particularly, the interpretation will focus on the applicability of the toolkit in enhancing nurses' and patients' diabetes and diabetes self-management knowledge. DNP student will communicate the results and recommendations to organizational leaders and program stakeholders through a systematic presentation and poster.

Summary

With the large number of diabetic patients in the U.S., healthcare providers must be innovative in addressing the burden of diabetes-complicated outcomes using comprehensive approaches that will not only address the management of diabetes, but the factors leading to the disease. The best approach to diabetes care is prevention and management through lifestyle modification. Nurses and patients should be educated about diabetes self-management. The proposed toolkit is one way to provide nurses with resources to improve management of diabetes among patients in the clinic.

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