2020

# Staff Education: Prediabetes Lifestyle Modification Toolkit

Vivian Elege
*Walden University*

# Walden University

College of Health Sciences

This is to certify that the doctoral study by

Vivian Ngozi Elege

has been found to be complete and satisfactory in all respects,
and that any and all revisions required by
the review committee have been made.

Review Committee
Dr. Cheryl McGinnis, Committee Chairperson, Nursing Faculty
Dr. Kathleen Wilson, Committee Member, Nursing Faculty
Dr. Casey Cole, University Reviewer, Nursing Faculty

Chief Academic Officer and Provost
Sue Subocz, Ph.D.

Walden University
2020

Abstract

Staff Education: Prediabetes Lifestyle Modification Toolkit

by

Vivian Ngozi Elege

MSN, Maryville University, 2015

BSN, Texas Tech University, 2010

Project Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Nursing Practice

Walden University

February 2020

## Abstract

Prediabetes patients are at a high risk for developing Type 2 diabetes. The purpose of this project was to educate the medical staff of the project site clinic on lifestyle modifications that can help patients prevent prediabetes from progressing to Type 2 diabetes. The project took place at an outpatient clinic in the Southwestern United States. The clinic patient population is mostly African American, a population at risk for diabetes. The theoretical framework to support the project was the Iowa model of evidence-based practice. Staff education on patient diabetes prevention was the goal of the project. The project question focused on staff education for lifestyle modifications to increase nurses' knowledge and skills on prediabetes patient management. Educational content of the module was formed using evidenced-based guidelines from the Centers for Disease Control and Prevention's Road to Health toolkit and from the American Diabetes Association. The educational program was evaluated by 3 content experts in primary care and diabetes management. Expert responses were measured with a 5-point Likert-scale survey. The expert panel indicated the content would be applicable and beneficial for clinic staff. The program was then provided to 3 clinic nurses. Each nurse answered pretest and posttest questionnaires to assess their knowledge on program content related to lifestyle modifications to prevent Type 2 diabetes. All participants answered the posttest questions as agree or strongly agree. Results from the questionnaires indicated the nurses improved their knowledge on the subject matter after program completion. The toolkit supports social change by providing nurses with the necessary education to help prediabetes patients experience improved outcomes.

# Staff Education: Prediabetes Lifestyle Modification Toolkit

by

Vivian Ngozi Elege

MSN, Maryville University, 2015

BSN, Texas Tech University, 2010

Project Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Nursing Practice

Walden University

February 2020

# Dedication

This project is dedicated to my husband, my children, and Mrs. Hope Adodo, for their overwhelming support and encouragement as well as their unfailing love.

# Acknowledgments

Foremost, I would like to thank God. To God, be the glory for all my accomplishments because I have countless reasons to glorify his name.

My sincere gratitude goes to my wonderful husband E-Mac. Thank you for all the support throughout this journey. You have helped with some activities in the house in order to make it easier for me to complete the DNP program.

I thank my sons, Michael and Kenny, for their love and patience. I will now have time to spend with you when this program is over. You deserve a trip to Paris! A special feeling of gratitude to my daughters and grandchildren for their ability to lift my spirits when I am down. Thank you my dearest sister Nwakuso, you have never left my side and you are very special to me. Special thanks to Mrs. Hope Adodo. Your love, support, and encouragement kept me going. I thank my friend Mrs. Francisca Offordili. The numerous times you have helped me to cook during my chaotic schedule will not be forgotten.

Thank you, Ms. Scholastica Nwodo FNP-C, my preceptor, for giving me opportunities in her clinic and guiding me on my project.

Last, but not the least, I would like to thank my mentor Dr. Cheryl McGinnis, Dr. Joan Hahn, and my project committee for their encouragement, constructive comments, and questions. Thank you for the opportunities to help me grow.

Thank you, everyone!

Table of Contents

List of Tables

Section 1: Nature of the Project

## Introduction

Prediabetes is a condition when a patient's fasting plasma glucose level is 100–125 mg/dl or hemoglobin A1C (A1C) of 5.7–6.4% (Abdallah, Ahmed, Stevens, & Griebeler, 2019). Prediabetes occurs when glucose levels are higher than usual but not in the diabetes range, which is hemoglobin A1C of 6.5% and above (Phillips, Ratner, Buse, & Kahn, 2014). Progression of prediabetes to Type 2 diabetes may be reduced through lifestyle interventions, such as diet and physical activity. These lifestyle changes are effective, harmless, and lucrative (Glechner et al., 2018). If prediabetes is uncontrolled, it can lead to Type 2 diabetes. In this section, I will focus on the background, problem statement, purpose statement, and significance of the project.

## Problem Statement

Prediabetes is on the rise worldwide and will continue to grow in years to come. Thirty-seven percent of adults age 20 years and above are being affected by prediabetes in the United States (Rariden, Lavin, & Yun, 2015). If an individual has prediabetes, they are at high risk of being diagnosed with diabetes, but prediabetes can be prevented from advancing to diabetes. The progression of prediabetes to Type 2 diabetes can be stopped or delayed in many prediabetic people through interventions such as lifestyle changes (Rariden et al., 2015). When prediabetes is detected early and the individual involved is educated and follows lifestyle changes, there is every chance for their blood glucose to correct to a reasonable level (Rariden et al., 2015). When patients visit the clinic, education on diabetes prevention may not be the key focus for the nurses because

diabetes may not be the main reason for the patient's office visit that day. Proactive education plays a fundamental role in empowering patients to take accountability for their health. Patients who receive continuing education on prediabetes are more successful in the management of the disease compared to those who are uneducated (Kleier & Welch-Dittman, 2014).

Prediabetes as a condition is increasing because of poor diet and sedentary lifestyle. Nurses need adequate knowledge to be able to educate patients. It was projected that 84 million adults in the United States would have prediabetes in 2015, and 70% of these adults will develop diabetes in the long-term (Jose & Thomas, 2018). Studies have shown that dietary changes, increasing physical activity, and managing obesity are effective in preventing prediabetes from advancing into Type 2 diabetes (Abdallah et al., 2019). With regards to prediabetic care and prevention of diabetes, nurses may be unaware of the methods and techniques available to effectively prevent Type 2 diabetes (Maryniuk et al., 2013). Educating patients is one way to prevent prediabetes from progressing to Type 2 diabetes. Diabetic nurse educators and nurses are well trained and licensed to guide diabetic patients.

Medical staff at the project site clinic reported that only one staff nurse knew about the CDC Road to Health toolkit educational material for preventing diabetes. The medical clinic does not have a protocol for prediabetes management and struggles with educating prediabetes patients on how to prevent progression to Type 2 diabetes. There is a defined need for staff education on prediabetes management to improve patient

education. The focus of this doctoral project included planning an evidence-based and sustainable prediabetes management educational program for the project site.

## Purpose Statement

Eating a healthy diet and increasing physical activity is important for prediabetes patients to prevent progression to Type 2 diabetes and, in effect, avoid the complications that can result from being diabetic. The complexities of diabetes—such as cardiovascular disease, diabetic retinopathy, and blindness—are causes of death among diabetes patients in the United States (Mao, Yip, &Chen, 2019). Prediabetes can be a financial burden if it progresses to Type 2 diabetes. Therefore, diet and exercise are essential to prevent prediabetes from progressing to Type 2 diabetes. Mao et al. (2019) stated that, according to the American Diabetes Association (ADA), $27 billion was spent treating patients with diabetes and $58 billion was spent for complications associated with diabetes in 2007.

Nurses should be knowledgeable about lifestyle modifications—such as diet and exercise—to prevent prediabetes from progressing to Type 2 diabetes. The project question is: Will staff education on lifestyle modification, including diet and exercise, increase the nurses' knowledge and skills on prediabetes patient management? The purpose of this DNP project was to educate nursing staff on a diabetes prevention program. The goal of the project was to develop and evaluate an educational program for clinic staff in a medical clinic in the Southwest region of the United States. The Road to Health Toolkit (CDC, 2016) provided the evidence-based practice (EBP) guidelines to support the development of the educational content. The medical clinic planned on using this toolkit as a standard of care to assist staff in teaching patients' lifestyle modifications

to prevent prediabetes from progressing to Type 2 diabetes. Prediabetes should be controlled to avoid the long-term complications of diabetes.

## Nature of the Doctoral Project

To meet the purpose of this doctoral project, I used evidence collected from the following databases: Medline, CINAHL, EBSCO host, Ovid Plus, Walden University library, Google Scholar, and Pub Med. I reviewed literature related to *prediabetes, Type 2 diabetes,* and *diabetes*. However, my approach was staff education on lifestyle modifications, including diet and exercise, to prevent prediabetes from progressing to Type 2 diabetes. This project followed the Walden DNP staff education manual to design and present a diabetes education program to nursing staff using the Road to Health Toolkit's (CDC, 2016) evidence-based content.

The nurses at my project site lacked the knowledge to educate prediabetes patients on lifestyle modifications such as exercise and physical activity, and patients were not receiving the education necessary to be proactive in preventing progression from prediabetes to Type 2 diabetes. Patients presented with elevated hemoglobin A1C of 5.7–6.4 but lacked knowledge on dietary changes and exercise, interventions that can assist in improving the hemoglobin A1C results. During a discussion with medical clinic staff regarding prediabetes patients, I identified gaps in staff knowledge regarding educating prediabetes patients. The medical clinic did not have an educational class for nurses on preventing prediabetes from progressing to Type 2 diabetes. From my literature review, I found out that prediabetes was a national and local problem. According to Abraham, Chaney, Huffman, & Kremer (2015), prediabetes is a significant health concern around

the world, including in the United States. Therefore, there is a need to educate the staff in the medical clinic on lifestyle modifications such as healthy diet and exercise to prevent the progression of prediabetes to Type 2 diabetes.

Nurses should have adequate knowledge of lifestyle modifications to prevent the progression of prediabetes to Type 2 diabetes. The knowledge level of the nurses at the site clinic was measured with pretest and posttest questionnaires. Prediabetes is a risk factor for developing Type 2 diabetes. Eating a healthy diet and increasing physical activity can help to prevent prediabetes from progressing to Type 2 diabetes in patients. According to Weisenberger (2019), ADA guidelines for preventing prediabetes from progressing to Type 2 diabetes are(a) physical activity of about 150 minutes every week, (b) a reduction in sitting for an extended period, and (c) nutrition and lifestyle changes. The guidelines offered EBP recommendations for clinic staff when making clinical decisions that can benefit prediabetes patients. ADA (2017) guidelines included lifestyle interventions for prediabetes patient to curb the progression to Type 2 diabetes.

The earlier patients find out about prediabetes, the sooner they can take action to prevent the progression to Type 2 diabetes. CDC guidelines reviewed by Nhim et al., (2018) are meant to increase the awareness of providers regarding the CDC lifestyle modification program. The approach of these guidelines is for providers to screen patients for prediabetes and refer them to the CDC life changes program.

The Road to Health Toolkit (CDC, 2016) content was used as a standard of care to teach nurses lifestyle modifications for patients with prediabetes. Education has the potential to decrease the progression of prediabetes to Type 2 diabetes among patients.

Therefore, staff education on lifestyle modification helped to improve knowledge and awareness of lifestyle modifications to prevent prediabetes from advancing to Type 2 diabetes.

## Significance

The goal of this DNP project was to develop and evaluate a program that can be used by medical clinic nursing staff to educate patients on the prevention of prediabetes advancing to Type 2 diabetes. This project supported the clinical staff to initiate teaching on diet and physical activity for prediabetes patients to potentially decrease the incidence of Type 2 diabetes. Educating patients on lifestyle modifications, including healthy diet and physical exercise, was intended to help reduce the overall costs of healthcare because such education has the potential to reduce the occurrences of hypoglycemia; hyperglycemia; and comorbidities such as neuropathies, retinal, peripheral, cardiovascular disease, and kidney disease. Without intervention, many patients with prediabetes will progress to Type 2 diabetes in 5 years (Healthy People 2020, 2017). This DNP project helped the clinic staff receive training and apply that knowledge in their practice in educating patients on preventing Type 2 diabetes using the CDC's (2016) Road to Health Toolkit. In preventing diabetes, a healthy diet and physical activity are vital. This DNP project has the potential to improve lifestyle behavior among patients with prediabetes who are at risk for Type 2 diabetes.

## Implications for Social Change

The implications for social change include the increase in staff knowledge on the current guidelines for prediabetes care and lifestyle modifications for patients.

Prediabetes patients need medical guidance and advice from experts. Patient outcomes can be improved with lifestyle changes, thus decreasing the risk of diabetes. Prediabetes patients who engage in lifestyle modification changes to prevent or delay advancement to Type 2 diabetes can benefit from other health benefits of physical activity and healthier diet, such as a decrease in weight. According to Trief, Cibula, Delahanty, & Weinstock (2017), lifestyle changes like a healthy diet and activity changes can result in weight loss. This new knowledge that the project site nurses acquired can be used to impact other nurses at the site by educating them on lifestyle modifications for patients to prevent prediabetes from progressing to Type 2 diabetes.

## Summary

Diabetes is linked to other health conditions that can be challenging for patients to manage. Lifestyle changes such as diet and exercise are necessary to prevent prediabetes from progressing to Type 2 diabetes. The CDC's (2016) Road to Health Toolkit was used for educational content. Based on EBP, healthcare organizations are becoming more aware that lifestyle modifications can help improve patient outcomes. Healthcare professionals play a significant role in educating and encouraging patients with prediabetes from preventing Type 2 diabetes.

In Section 1, I discussed the DNP practice problem, project purpose and question, and the significance to nursing. In Section 2, I will discuss the background and context of the project covering the literature review and theoretical framework of planning the prevention of Type 2 diabetes prevention in a medical clinic setting.

Section 2: Background and Context

## Introduction

Type 2 diabetes is one of the leading causes of disability and mortality globally (Rahmati-Najarkolaei et al., 2017). Projections indicate that 10% of the global population will develop diabetes by the year 2030 (Rahmati-Najarkolaei et al., 2017). In individuals who are prediabetic do not change to a healthier lifestyle, they are likely to be diagnosed with Type 2 diabetes (Rahmati-Najarkolaei et al., 2017). Lifestyle modification is the key to preventing diabetes. In Section 2, I discuss the literature review and theoretical framework to support the planning and development of staff education on prevention interventions for the advancement of prediabetes to Type 2 diabetes.

## Concepts, Models, and Theories

The critical framework of this project was the Iowa model (Grove, Burns, & Gray, 2013). This model is an evaluation model that can support a project designed to educate staff on patient interventions to prevent prediabetes from progressing to diabetes. The model addresses EBP through an organizational point of view, instead of from an individual provider's point of view. This model gives clinicians and nurses' guidance in everyday decision-making to provide quality patient care (Grove et al., 2013). This model provides opportunities for individuals to pay special attention to knowledge and those behaviors that can cause problems. Moreover, the model makes the staff question existing nursing practices and see if care can be improved using current research findings (Buckwalter et al., 2017).

**The Iowa Model**

The Iowa model focuses on organization and collaboration with all stakeholders (Buckwalter et al., 2017). The model pays attention to the knowledge and problem focus triggers, leading staff to research current nursing practices and determine whether care can be improved using existing research (Grove, Burns, & Gray, 2013).

The first step is identifying a clinical practice question, which is triggered by a problem in the setting or new knowledge discovery. If the problem is a priority for the organization, the next step is bringing colleagues together to form a team to start searching for relevant literature. If evidence is insufficient, the review of additional literature may be required. However, if evidence is conclusive and points toward a change in practice, the next step is to pilot a practice change (Brown, 2014). If the pilot is successful, it can be transformed into an organizational practice change, but the team will continue to evaluate the change after implementation (Brown, 2014). Nursing care for prediabetes patient helps in promoting healthy behavior and preventing disease, but this involves educating patients on lifestyle modifications such as diet and exercise. Increasing the skills and knowledge of nurses regarding Type 2 diabetes prevention is necessary so they can relay the information to prediabetes patients.

The Iowa model that guided this evidenced-based project was easy to follow, straightforward, and helped me to address the practice problem in an outpatient clinic. In this project, I used the Iowa model to examine nurses' knowledge related to preventing prediabetes from progressing to Type 2 diabetes. The Iowa model is a widely used pragmatic approach to the EBP process (Buckwalter et al., 2017). Type 2 diabetes as a

result of prediabetes is an issue that prompted the need to develop an educational project for nurses so that they could properly inform prediabetic patients on lifestyle modifications to prevent Type 2 diabetes.

Using the Iowa model for this project to promote practice change included the following four steps:

1. Literature search and review: The literature review for this project will be from different search engines and websites, including the ADA and national guidelines. Such a review was used to make sure that information was available to answer the project question.
2. Reviewing current evidence: The current evidence in the clinic was through staff discussions and prediabetes patient observations. The current evidence in the clinic indicated that the staff needed more knowledge on how to educate prediabetes patient about preventing progression to Type 2 diabetes.
3. Development of prediabetes management toolkit: After determining that the project question was relevant, a team was formed including clinic stakeholders.
4. Assessing stakeholder satisfaction: If the change is deemed appropriate, it will be used in the medical clinic and study results will be circulated.

## Definitions of Terms

*Diabetes*: A chronic disease in which there are high levels of sugar in the blood due to lack of insulin, an inability of the body to use insulin, or both (ADA, 2011).

*Road to Health Toolkit:* A program designed to delay or prevent the development of diabetes in African-American and Latino communities with prediabetes. The National

Diabetes Education Program, in partnership with the National Institutes of Health and the CDC, developed this educational material (CDC,2016).

*Prediabetes*: High blood sugar, but not high enough to be diabetes. Prediabetes patients are at risk of developing Type 2 diabetes (ADA, 2011).

*Type 2 diabetes*: Known as noninsulin-dependent or adult-onset diabetes, it occurs when the body develops resistance to insulin or does not produce enough insulin to regulate blood glucose.

## Relevance to Nursing Practice

EBP helps to improve the quality of patient care and control healthcare costs. Several EBP models currently exist to assist nurses and other healthcare providers in incorporating the best evidence into clinical practice. The Iowa model of EBP can be useful in promoting quality patient care. Continuing education for nurses will help improve clinical practice. Brown (2014) agreed that nurses need to implement interventions in their practice based on the highest level of evidence. Lifestyle change, including diet and exercise, is an evidence-based approach to preventing prediabetes from progressing into Type 2 diabetes (Glechner et al., 2018).

Due to the increase in the number of patients with Type 2 diabetes, the U.S. Veterans Administration developed the MOVE program to emphasize the importance of lifestyle changes that can help to improve health and prevent the implications of diabetes (Jackson et al., 2017). Educating patients on the importance of lifestyle modifications is essential and proper.

The project allowed the medical clinic staff to education prediabetic patients about implementing lifestyle changes to prevent progression into Type 2 diabetes. The cost of healthcare would also be reduced by minimizing care needed. The evidence-based nursing practice guideline developed from this project will act as a resource to other healthcare professionals to promote lifestyle modifications among prediabetes patients. This project empowers nurses to educate prediabetes patients on lifestyle changes—such as diet, smoking cessation, and exercise—to prevent Type 2 diabetes and to promote the goal of Healthy People 2020, which is reducing health disparity among diabetes patients (Diabetes Healthy People 2020, 2019).

**Lifestyle Modification**

Prediabetes patients should be more active to prevent progression to Type 2 diabetes. According to Brouns (2018), Lifestyle intervention in patients at increased risk of developing Type 2 diabetes, and eat a healthy diet, results in preventing the long-term progression of Type 2 diabetes. Lifestyle modification such as smoking cessation, healthy eating, and physical activity must be the ultimate goal to prevent prediabetes from progressing into Type 2 diabetes. National guidelines and EBP recommendations agreed that lifestyle intervention is pertinent for prediabetes patients to reduce blood sugar (ADA, 2017).

A sedentary lifestyle leads to obesity and needs avoidance to prevent prediabetes. Prediabetes patients should be educated by the nurses to move more by being active. According to Khan et al. (2017), after observing 130 students from five different classes between January 2016 to June 2016, to determine the occurrence of prediabetes and the

various risk factors associated with it. The result of the study indicated that a sedentary lifestyle and obesity are risk factors for prediabetes. The most critical cause of prediabetes is lack of exercise and obesity.

Changing one's lifestyle and incorporating healthy eating habit and exercise will help to reduce hemoglobin A1C and most likely prevent prediabetes from progressing to Type 2 diabetes. Weight loss will help to decrease blood glucose level, and this is because insulin resistance can be reduced by exercising. With insulin resistance, insulin is not going into the cells. Weight loss will help the pancreas keep up with the body's need for insulin. If glucose remains in the bloodstream, it causes high blood glucose levels leading to prediabetes, and they may progress to Type 2 diabetes (Thaane, Motala, & Mckune, 2019). Das et al. (2019) reviewed studies that researched the long- and short-term benefit of a structured lifestyle modification program among 93 employees diagnosed with diabetes. The findings indicated that there was a mean decrease of 0.6 percentage points in Hemoglobin A1C values from baseline in 12 months. Also, weight, Basic Metabolic Index, blood pressure, and lipid profile improved significantly after 12 months.

**Smoking cessation.** Smoking can damage the pancreas. Nicotine from tobacco makes the pancreas produce less insulin, causing a slight increase in blood sugar and glucose (Thaane et al. 2019). Nicotine causes vasoconstriction and decreases circulation. Smoking cessation is a therapeutic non-pharmacological approach for the management of obesity-associated disease such as diabetes and insulin resistance (Thaane et al. 2019).

Hence, it is necessary to educate patients on the importance of smoking cessation to reduce their risks of prediabetes and Type 2 diabetes.

**Physical activity.** If prediabetes patients are educated by the nurses to walk for at least 30 minutes every day, prediabetes can be prevented from progressing to Type 2 diabetes. Lack of physical activity is the most dominant, adjustable risk factor for diabetes. The supportive and educational environment is essential in influencing people's choices, by choosing a regular physical activity the most natural choice and engaging in regular physical exercise such of about 150 minutes spread through the week for adults (WHO, 2016). Increasing physical activity will help to prevent overweight and obesity. Therefore, exercise programs that will include walking and jogging will be very beneficial to halt the progression of prediabetes to Type 2 diabetes. Participation in physical activity and a family, educational, and work environment can positively reinforce healthy living (WHO, 2011). Educating patients on the importance of exercise will help to change sedentary lifestyle and the risk factors associated with it like diabetes.

**Healthy diet.** Dietary changes will help to prevent prediabetes from progressing to Type 2 diabetes. There is no one particular eating plan that is good for everyone. Every individual is different, and so are their beliefs and culture. Therefore, prediabetes patients should be allowed to eat what they like but need to be cognizant of portion sizes (Nwankwo & Funnell, 2017). Patients must be educated on a diet but should abide by the meal plan that works for them. According to Antonia -Rodriguez et al., (2019), dietary approach to stop hypertension entails eating fruits, vegetables, fat-free dairy products, grains, fish, and lean meats while limiting sodium, alcohol, red meats, and sweets. The

DASH diet is a healthy eating plan that will benefit prediabetes patients, although developed for patients with elevated blood pressure (Nwankwo & Funnell, 2017). The key to a healthy diet is moderation.

**Nurses Knowledge about Diabetes**

Prediabetes can be prevented if patients get adequate education and guidance from the nurses and experts. Nurses are expected to educate prediabetes patient who is at risk for diabetes in healthcare facilities. Nurses lack sufficient knowledge to educate patients on lifestyle changes (Youngs, Gillibrand, & Phillips, 2016). However, prediabetes is increasing in number so nurses should have a good understanding and education to help the patients. Hence, Youngs et al. (2016) agreed that patients need enthusiasm and teaching to learn how to prevent the progression of prediabetes to Type 2 diabetes and the complications associated with diabetes. Being that one of the chief complaints of prediabetes patients for non-compliance with lifestyle changes is knowledge deficit. Alotaibi, Gholizadeh, Al-Ganmi, & Perry (2018), researched to examine reasons and the cause of sufficient knowledge of nurses concerning diabetes care. A total of 16 nurses from different areas of specialty were interviewed. The researchers concluded that continuing education would be beneficial to assist nurses in improving their knowledge and skills in diabetes care.

Clinical nurses lack the knowledge and do not feel comfortable with prediabetes education. Hu, Yang, Chuang, & Liu (2018) published the result of their study about the understanding of nurses concerning caring for diabetes patient. Feedback received from 41 nurses that work in five long term care facilities. In conclusion, nurses have a lack of

sufficient knowledge about diabetes and require education to improve their understanding. Silva Paraizo et al. (2018) also conducted a systematic review of the experience of nurses on diabetes. Thirteen nurses who worked in primary healthcare units were interviewed. The authors concluded that the participants lack knowledge regarding diabetes. It is quite clear that nurses are not dieticians. Nurses need basic dietary knowledge and skills to care for prediabetes patients to decrease progression to Type 2 diabetes.

**Diabetes impact.** Long term complications of diabetes are cardiovascular disease, kidney disease, neuropathy, and retinopathy. Diabetes is a healthcare burden. Knowing what medical care is necessary is helpful to plan for the need and cost of healthcare in the future. Many countries use about 10% of the money budgeted for healthcare in preventing and dealing with the complications associated with diabetes (Sweileh, 2018). The knowledge of the burden associated with diabetes is pertinent for future planning of the cost and need of healthcare. Magliano, Martin, Owen, Zomer, & Liew (2018) conducted a study on the impact of diabetes on efficiency and concluded that eliminating diabetes can increase life span. Hence, employers and the government should be aware of the effects of diabetes and provide different programs for prevention. Early detection is vital.

**Cardiovascular complications**. High blood glucose increases plaque buildup in the arteries. Therefore, the plaque makes it difficult for blood to flow or even block the arteries causing heart attack, coronary artery disease, angina, cerebrovascular accident, and atherosclerosis. Over time, this elevated blood glucose damages the blood vessels

that control the heart and blood vessels (ADA, 2015). Prediabetes is a risk factor for diabetes and diabetes if not adequately controlled, can reduce the patient's life span. In the research that examined the relationship between the risk factors that cause mortality and cardiovascular hospitalization linked to high hemoglobin A1C levels in a group of diabetic patients from the Escarval- risk study (Navarro-Perez et al., n.d.). This study used the information on 3,205,724 individuals that are 30 years and older in 2007 as well as diabetic men and women that do not have cardiovascular disease. The study concluded that diabetes and uncontrolled glucose levels are the cause of mortality and cardiovascular diseases.

**Diabetic nephropathy.** One of the long-term complications of diabetes is kidney damage. Kidney gets rid of waste products and filters toxins from the body. Therefore, an elevated blood glucose level makes the organ to work harder and then leaks albumin (protein) into urine indicating kidney damage (American Heart Association,2016). Hence, when diabetes is well controlled, there will be less chance of kidney disease.

**Diabetic neuropathy.** When high levels of blood glucose go through blood vessels, nerve damage occurs. Nutrients will not get to the nerves when they are damaged, causing feelings of tingling and burning. If the nerve eventually dies, there will be a complete loss of sensation and minor injuries can lead to diabetic ulcer, infections, and amputation of the affected limb (American Heart Association, 2015).

**Diabetic retinopathy.** This diabetes risk causes damage to the vessels around the eyes due to elevated blood glucose. When the body tries to repair these damaged vessels, it can cause swelling and bleeding (inflammation) inside the eyes and may eventually

cause blindness, glaucoma, and cataracts in the affected eye or eyes (American Heart Association, 2015). With daily physical activity and eating a healthy diet, the occurrence of the complications of diabetes can be reduced.

**Educational Tool Kit**

The National Diabetes Education Program, in partnership with the National Institutes of Health and the CDC, developed the Road to Health Toolkit (CDC, 2016). A program designed to delay or prevent the development of diabetes in the African-American and Latino communities with prediabetes (CDC, 2016). This educational intervention will cover the Road to Health Toolkit (CDC, 2016), which has three sections that will guide nurses to educate prediabetes patients on lifestyle modifications to prevent the progressing of prediabetes to Type 2 diabetes. The activities and instructions contained in the toolkit will be easy to use and put into action. There is pertinent information in the toolkit to teach the nurses' lifestyle modifications to prevent prediabetes from progressing to Type 2 diabetes. The participants will also be given information on how to find the Road to Health Toolkit educational materials on the Internet. The medical clinic does not have any developed instructional materials for prediabetes education. It is thus creating a gap in nursing and patient education on management prediabetes. Therefore, I will develop an educational program based on the current toolkit content related to lifestyle modification. It will be used by staff in the medical clinic to teach prediabetes patients recommended lifestyle modifications. The toolkit consists of lifestyle modifications such as physical exercises, smoking cessation, and weight loss from eating a healthy diet to prevent the progression of prediabetes to

Type 2 diabetes. International Diabetes Federation (2019) recommends that lifestyle changes, including eating healthy eating and physical activity, can delay or prevent prediabetes from progressing to Type 2 diabetes.

The road to health toolkit content. This toolkit has three sections with helpful activities that will be beneficial to the patients:

Section 1. This section discusses diabetes, how it affects the body, diabetes risk factors, and how to prevent diabetes along with activities such as portion control. It also explains what diabetes is, people at risk for diabetes, and how to prevent or delay Type 2 diabetes. Included in this section are activities that can be used to educate nurses in the objective for the part that diabetes is preventable (CDC, 2016).

Section 2. This section explains how to make healthy food choices, reading labels, and finding hidden fats. It contains reading labels to identify the calories, hidden fat in the food, and how to eat the right portion of food. Activities in this section include: "where do calories come from," "community waterlogs," etc. (CDC, 2016).

Section 3. This section clarifies how individuals can improve their health by staying active regularly, which will help to reduce the risk of diabetes. It explains how often and what type of physical activities individuals need. For example, 30 minutes of exercise daily will be beneficial to prevent the progression of prediabetes to Type 2 diabetes. This section also discourages barriers and excuses that make individuals not to exercise to stay healthy. However, activities in this section include: "A journey of two" (CDC, 2016). There should be a reward for healthy lifestyle choices

## Local Background and Context

This staff education project will be conducted in a family medical clinic located in the Southwest of the United States. The clinic provides care to children, adults, and geriatric patients. The staff comprised of one physician, two nurse practitioners, three registered nurses, a secretary, and a laboratory technician. The clinic provides care mainly to Hispanic and African American ethnics of a low socioeconomic background who are at high risk of developing Type 2 diabetes. The target audience for the DNP project is the nurses in the medical clinic because they have minimal knowledge in the past about prediabetes, diabetes care, and diabetes prevention and will be responsible for implementing the program to teach clinic patients with prediabetes. The nurses are the main stakeholders and will evaluate the program due to their knowledge. Developing a lifestyle modification toolkit will need content validity.

As a primary care provider, who works in an outpatient clinic interacting and educating prediabetes patients, I am in a position to incorporate this information regarding lifestyle modifications such as physical activity and healthy diet to prediabetes patients to prevent progressing to Type 2 diabetes through staff education. Prediabetes patients in the clinic are not educated appropriately on lifestyle modifications due to knowledge deficits and lack of protocols in the clinic. The medical clinic staff will be trained to be able to teach new nurses hired in the clinic and prediabetes patients.

## Role of the DNP Student

The medical clinic setting currently has no specific guidelines and lacked staff education by the nurses to the patients aimed at decreasing the progression of prediabetes

to Type 2 diabetes which led to the research of this issue. The first and seventh essentials of doctor prepared advanced practice registered nurse guided this educational program. I am familiar with the medical clinic after prior completion of my clinical hours for NP program in the clinic. First, I reviewed literature, applied evidence-based practice to develop the education content. However, as the leader of the program, I used the Road to Health Toolkit (CDC, 2016) to educate nurses on lifestyle modifications to prevent or delay Type 2 diabetes. This educational toolkit was for disease prevention and promotion of health of the patients/population.

Nurses must have a concrete understanding of lifestyle modifications, including diet and exercise, to be able to educate the patients properly. A pretest was completed before the initiation of the program to find out the gap in knowledge, strengths, and weaknesses of the nurses about lifestyle modification with a pretest questionnaire. I then planned the project and worked with other nurses who had some education regarding caring for diabetes patients to design, develop, evaluate, and implement the program. I also had panel of experts to assess the project content and ease of use. Then I modified the program based on feedback and then presented the program to a small group of staff. A posttest questionnaire was given to the nurses after the project.

My motivation for this project was that timely identification and lifestyle interventions will benefit the patient by changing their physical activity behavior and diet, which will help to decrease the risk of Type 2 diabetes. Using lifestyle modifications such as diet, weight loss, and exercise to prevent or delay Type 2 diabetes in persons with

prediabetes. Early identification and improved awareness of prediabetes are critical to encouraging those with prediabetes to make healthy lifestyle changes.

## Summary

Prediabetes can be prevented from progressing to Type 2 diabetes, as indicated in the review of the literature. The problem of prediabetes progressing to Type 2 diabetes is attributed to lack of knowledge by the nurses to educate the patients with prediabetes. In Section 2, I reviewed the current literature and discussed the theoretical framework for planning the prevention of Type 2 diabetes in a medical clinic.

## Section 3: Collection and Analysis of Evidence

### Introduction

The purpose of this DNP project was to create an educational program using the CDC's Road to Health Toolkit to educate the staff on guidelines for preventing prediabetes from advancing to Type 2 diabetes in a family medical clinic. This educational project assisted staff in teaching patients about lifestyle modifications to prevent prediabetes from progressing to Type 2 diabetes. The project involved an expert panel that developed and evaluated the content of the toolkit. The clinic indicated a need to educate staff on lifestyle modifications, including a healthy diet, physical activity, and smoking cessation to prevent prediabetes from progressing to Type 2 diabetes.

### Practice Focused Question

The Road to Health Toolkit (CDC, 2016) was used during this intervention as an educational module for staff nurses in a medical clinic. The project question asked: Will staff education on lifestyle modification, including diet and exercise, increase the nurses' knowledge and skills on prediabetes management?

### Sources of Evidence

The Road to Health Toolkit contains materials developed by the CDC to help individuals, especially African Americans, at risk for Type 2 diabetes prevent or delay Type 2 diabetes (CDC, 2016). The toolkit contains EBP guidelines on lifestyle modifications such as diet and exercises to prevent prediabetes from advancing to Type 2 diabetes. The project goal was to create an educational program using the Road to Health Toolkit that applies to staff education in the medical clinic. The medical director

supported the idea of implementing the toolkit for staff education. The medical clinic setting currently has no formal staff education or patient educational materials aimed at decreasing the incidence of Type 2 diabetes among patients with prediabetes. The clinic staff will be able to use the materials provided during this project when teaching patients with prediabetes. This DNP project helped nurses become educated on diabetes patient management. The nurses can apply the knowledge in their practice to educate patients on preventing Type 2 diabetes using the CDC's (2016) Road to Health Toolkit.

In planning the development of the educational project, I completed a comprehensive literature search using Medline, CINAHL, EBSCO host, Ovid Plus, Walden University library, Google Scholar, Pub Med, and CDC and ADA websites to obtain information on lifestyle modifications to prevent prediabetes progressing to Type 2 diabetes, diabetes risks, and knowledge gaps in the practice of nurses. Literature reviewed were within 5 years, and the information collected was also applied to the educational project. The articles reviewed discussed the awareness of patients and healthcare professionals regarding the prevention of diabetes, education regarding lifestyle modifications or changes, and the risks associated with prediabetes and diabetes. Also, a current evidence-based lifestyle modification toolkit was determined to be put to practical use in developing a lifestyle modification toolkit and an educational project to suit the needs of the medical clinic staff.

## Project Design and Methods

The main goal for the DNP project was to develop a staff educational program using the Road to Health Toolkit to teach lifestyle modifications for managing

prediabetic patients. When staff and patient need in the clinic were explored, medical providers and staff stated that many patients converted from prediabetes to Type 2 diabetes. The clinic does not use specific diabetes guidelines for prediabetic patient management. Staff education programs on diabetes have not been available for the nursing staff. Therefore, clinic staff members lacked education on current diabetic guidelines and lifestyle modifications necessary in teaching prediabetic patients. This staff education project applied the Road to Health Toolkit for lifestyle modification for prediabetes patients to teach nurses how to educate patients on lifestyle modifications.

This staff education project was guided by the Walden University DNP Staff Education Manual. I assumed the role of the project leader. As the project leader, I worked in collaboration with the stakeholders, including the clinical staff and other experts as well as the medical director, to develop the education program and pretest/posttest questions were used to evaluate the effectiveness of the educational program. After the development of the program content, I presented the educational program to the panel of experts who assessed the content and provided recommendations. The program was modified based on content expert recommendations. Then, the project was presented to the staff participating in the project. A pretest was administered before the program and then again after the program to measure staff knowledge.

**Participants**

The criteria for the expert panel members included their knowledge and years of experience in their field of practice. The expert team for the educational program review consisted of the medical director for the clinic, one nurse practitioner, and a staff nurse.

The medical director has10 years of experience in caring for patients with diabetes and prediabetes. The family nurse practitioner involved in the evaluation of the educational project has 5 years of experience in primary care taking care of prediabetes and diabetes patients. The registered nurse who is also a Diabetic educator with approximately 5 years of experience in primary care clinic takes care of patients, including patients with prediabetes and diabetes.

As the project leader, I have about four years of experience as a nurse practitioner in primary care and served as the project leader. For the sustainability of the educational project, as the project leader I was planned, implemented, and evaluated the educational program.

All participation was voluntary. The names and addresses of the participants were not used in the educational project. All the participants were notified and assured that all information was confidential.

**Procedures**

I developed the educational program that consisted of a 90- minute PowerPoint presentation and educated the participants on the lifestyle modifications of the Road to Health Toolkit (Appendix A). The three members of the expert panel was asked to review the content of the educational program for application in the clinical setting and their understanding of the content. The three members of the expert panel completed the expert panel questions (Appendix B), and the results were anonymous. The Questions for the expert panels and the participants was based on a Likert scale scoring system: *strongly agree* (5 points), *agree* (4 points), *neutral* (3 points), *disagree* (2points), and *strongly*

*disagree* (1point). The pretest and posttest questionnaires were completed by all the participants before and after the presentation of the project, and the results was anonymous (Appendix C).

**Protections**

Project approval was obtained from Walden's institutional review board(IRB) # 10-28-19-0413094. Participant's confidentiality and privacy was protected during the planning and implementation of the project. A site agreement form that gave the authorization to implement the project in the clinic was completed by the authorized personnel of the clinic and submitted with the Walden IRB application. The project was a staff educational project, and there was no patient intervention. Staff participation in the project was voluntary. Participants were also notified that they can withdraw from project participation at any time during the program. All participant responses remained anonymous and will be kept in a locked cabinet for 5years.

## Analysis and Synthesis

The project leader used descriptive statistics and graphical representation to analyze the data collected from the questionnaires. First, I evaluated the expert panel results and made any recommended changes to the content. The educational program was then implemented with the application of pretest and posttests to analyze staff knowledge and understanding of prediabetes management, using descriptive statistics. Future recommendations for clinic practice change was presented to the leaders of the clinic.

## Summary

Clinicians have a vital role to play with regards to educating patients with prediabetes on lifestyle modifications, including eating a healthy diet, smoking cessation, and exercise to reduce weight to prevent Type 2 diabetes. The staff in the family clinic must be prepared with the materials and knowledge of existing EBP to provide effective teaching on the prevention of Type 2 diabetes.

# Section 4: Findings and Recommendations

## Introduction

In Section 4, I will analyze and report data from project evaluations. The project goal was to address the gap in knowledge and educate nurses on lifestyle modification strategies for patients to prevent prediabetes progressing to Type 2 diabetes. The purpose of this doctoral project was to educate nurses on a lifestyle modification toolkit for use in the prevention and management of prediabetes patients in an outpatient clinic to prevent the progression of prediabetes to Type 2 diabetes.

## Findings and Recommendations

The toolkit was developed and was used to educate and guide nurses to teach prediabetes patients lifestyle modifications, such as eating healthy diet, smoking cessation, and exercise, to prevent their progression to Type 2 diabetes. All members of the expert panel completed the consent form prior to the presentation of the educational program. The education consisted of a 90–minute PowerPoint presentation on the contents of the lifestyle modification toolkit. The educational program was presented to three experts: the medical director, a nurse practitioner, and a registered nurse who is a diabetic educator. The panel of experts had previous experience in primary care clinics and with patients including patients with prediabetes and diabetes. The panel of experts evaluated the program content (Appendix A).

The three members of the expert panel completed the expert panel questions (Appendix B), and their knowledge and confidence in the educational toolkit were measured. The questions for the expert panel and the participants was based on a Likert

scale scoring system: *strongly agree* (5 points), *agree* (4 points), *neutral* (3 points), *disagree* (2points), and *strongly disagree* (1point). The responses from the expert reviewers were positive. Questions 1–5 in Appendix B were designed to evaluate expert reviewers'(N=3) opinions on the appropriateness of the content of the lifestyle modification toolkit. The expert panel questionnaire (Appendix B) was answered by all the experts and the feedback confirmed the importance of the project. The panel also agreed that they easily understood the educational module, it was very informative, and they believed it would improve the knowledge of the nurses and would be applied in clinical practice for the nurses. All the expert feedback was anonymous. Table 1 illustrates the survey results from the panel of experts.

Table 1

*Expert Panel Program Questionnaires*

| Survey questions | SD | D | N | A | SA |
|---|---|---|---|---|---|
| 1.Staff participation in this lifestyle modification program will help to improve patients' care in the clinic. | 0 | 0 | 0 | 0 | 3 (100%) |
| 2. This educational program will improve the knowledge of the staff. | 0 | 0 | 0 | 0 | 3 (100%) |
| 3. The content of the lifestyle modification toolkit will be easy to understand by the clinic staff | 0 | 0 | 0 | 0 | 3 (100%) |
| 4. The content of the lifestyle modification program will help nurses to provide care. | 0 | 0 | 0 | 0 | 3 (100%) |
| 5. The style of the PowerPoint presentation will be easy for the staff to understand. | 0 | 0 | 0 | 0 | 3 (100%) |

*Note*.SD=strongly disagree, D=Disagree, N=Neutral, A=Agree, SA=Strongly Agree

Question 6 of the expert panel questionnaire was an open-ended question asking for overall comments. The three expert panel members' comments on the educational toolkit presentation did not indicate that program changes were needed before presenting the content to the clinic staff.

The content of the presentation was very informative and will be integrated into our practice.

During new staff orientation, the educational module will be used to train new staff members.

The PowerPoint presentation was very easy to understand and will be easy to understand by everyone.

**Participants Pretest Questionnaire Results**

After the panel of experts reviewed and approved the educational program, it was presented to the clinic participants. Three staff members participated in the educational training on the prediabetes lifestyle modifications toolkit. The participants included one nurse practitioner and two registered nurses. The Consent for Anonymous Questionnaire was provided to each participant prior to the presentation. The participants were told the program was voluntary, they could withdraw at any time, and that questionnaire results would remain confidential. First, each participant completed the pretest questionnaire. The pretest questionnaire provided a baseline for staff knowledge prior to receiving the educational program. Table 2 shows the results of this pretest questionnaire.

Table 2

*Participants Pretest Questionnaire, N = 3*

| Questions | SD | D | N | A | SA |
|---|---|---|---|---|---|
| 1.The education on patient lifestyle modifications changed my attitude on the importance of healthy eating and physical activity. | 0 | 0 | 1 (33%) | 1 (33%) | 1 (33%) |
| 2. Sedentary lifestyle and obesity can increase risk of Type 2 diabetes. | 0 | 0 | 1 (33%) | 1 (33%) | 1 (33%) |
| 3. Type 2 diabetes has serious consequences such as kidney failure, blindness, loss of toes, feet, and legs. | 2 (67%) | 1 (33%) | 0 | 0 | 0 |
| 4. Educating patients on lifestyles modifications may help to prevent prediabetes progressing to Type 2diabetes. | 0 | 0 | 1 (33%) | 2 (67%) | 0 |
| 5. Staff should receive annual education on lifestyle modifications, such as diet, smoking cessation, and physical activity for patients with prediabetes or diabetes | 0 | 0 | 2 (67%) | 1 (33%) | 0 |

*Note*. SD= Strongly disagree, D=Disagree, N=Neutral, A=Agree, SA=Strongly agree.

Questionnaires were administered, and responses were used to determine participants' level of knowledge prior to the educational program. Answers to all the pretest questions indicated a knowledge gap as evidenced in Question 3, in which most answers to the question were below expectations. This showed a clear lack of knowledge of the subject matter. This entry behavior to identify prerequisite knowledge was the purpose of administering the pretest questionnaire and the responses validated the need to educate the clinic’s medical staff on lifestyle modifications to prevent prediabetes progressing to Type 2 diabetes.

**Participants posttest Questionnaire Results**

Participants were presented the 90-minute PowerPoint presentation (Appendix A). The presentation content included three sections that will guide nurses to educate prediabetes patients on lifestyle modifications to prevent the progressing of prediabetes to

Type 2 diabetes. Section 1 discussed diabetes, how it affects the body, diabetes risk factors, and how to prevent diabetes. Section 2 explained how to make healthy food choices, reading labels, and finding hidden fats. Section 3 clarified how individuals can improve their health by staying active regularly, which will help to reduce the risk of diabetes.

After the program was concluded, all participants were provided the posttest questionnaire. They were instructed to answer each question and not to write any identifying information on the questionnaire. The posttest questionnaire results are presented in Table 3. Answers to all the questions indicated knowledge improvement on the Posttest questions. The feedback obtained from the evaluation confirmed the need of the project and the relevance to the nurses for teaching patients' health promotion and prevention through lifestyle modifications such as eating healthy diet, smoking cessation, and progressive exercise activity.

Table 3

*Participants Posttest Questionnaire*

| Questions | SD | D | N | A | SA |
|---|---|---|---|---|---|
| 1.The education on patient lifestyle modifications changed my attitude on the importance of healthy eating and physical activity. | 0 | 0 | 0 | 1 (33%) | 2 (67%) |
| 2. Sedentary lifestyle and obesity can increase risk of Type 2 diabetes. | 0 | 0 | 0 | 2 (67%) | 1 (33%) |
| 3. Type 2 diabetes has serious consequences such as kidney failure, blindness, loss of toes, feet, and legs. | 0 | 0 | 0 | 2 (67%) | 1 (33%) |
| 4. Educating patients on lifestyles modifications may help to prevent prediabetes progressing to Type 2diabetes. | 0 | 0 | 0 | 2 (67%) | 1 (33%) |
| 5. Staff should receive annual education on lifestyle modifications such as diet, smoking cessation, and physical activity for patients with prediabetes or diabetes | 0 | 0 | 0 | 1 (33%) | 2 (67%) |

*Note*. SD=Strongly disagree, D=Disagree, N=Neutral, A=Agree, SA=Strongly agree

## Project Implications

Prediabetes patients are faced with the problem of progressing to Type 2 diabetes, complications of diabetes, increase health cost because of hospitalizations poor health outcome. The ADA and CDC clinical guidelines guided the planning and development of the toolkit. As identified by the outcome of the posttest questionnaire, nurses improved their knowledge to educate patients on lifestyle modifications, improve patient outcome and provide referral for further needed resources. Using this evidenced-based lifestyle modification toolkit steered the nurses in making better clinical judgments for better patient outcome. The expected outcome when the lifestyle modification toolkit was implemented is improved nurses' knowledge and improved treatment outcome.

It was pertinent that nurses have better knowledge and information to educate prediabetes patients on healthy eating, smoking cessation, and exercise to prevent progressing to Type 2 diabetes. Nurses educated on lifestyle modification, would help to transfer the information to the clinic patients. The lifestyle modification toolkit will considerably help in the prevention of prediabetes progressing to Type 2 diabetes and early management of prediabetes patients by the nurses upon implementation. Educating nurses on lifestyle modifications such as healthy eating, smoking cessation and physical activity has the potential to improve patient outcome, hence, promoting a useful social change. Social change will also be influenced by this project by reducing the number of prediabetes patients who will progress to Type 2 diabetes.

## Project Strengths and Limitations

The content experts of the clinic made time to discuss the viability of the project plans. The content experts for the study include a medical director, nurse practitioner and a registered nurse that is also a diabetic educator. They recognized and supported the need for the staff education program. The content of the project was evaluated by the content of experts who has different knowledge which helped the toolkit to have a wide based knowledge from different specialty to determine its content, quality, and appropriateness. The medical director has10 years of experience in caring for patients with diabetes and prediabetes. The family nurse practitioner involved in the evaluation of the educational project has 5 years of experience in primary care taking care of prediabetes and diabetes patients. The registered nurse who is also a Diabetic educator with approximately 5 years of experience in primary care clinic takes care of patients, including patients with prediabetes and diabetes.

The content of the lifestyle modification program has necessary information that will benefit prediabetes patients in the clinic and help to prevent prediabetes progressing to Type 2 diabetes. The result from the pretest and posttest questionnaires was able to confirm that the program was important in addressing the knowledge gap of the nurses in the clinic. This educational program will also help to improve the knowledge of new graduate nurses.

One limitation of the project is the small sample size of three participants. Therefore, the result of the project cannot be generalized to a larger population. The

program will require time from the busy schedule of the nurses in the medical clinic office.

## Project Recommendation

One recommendation for future improvement in the program is to update content yearly, including new research on prediabetes management presented in the literature.

## Summary

Evaluation of the results of the questions indicated the importance of the educational program for the medical clinic staff. With the knowledge improvement, the medical clinic staff will be guided with the educational module to educate the clinic's prediabetes patients on lifestyle modifications such as healthy eating, smoking cessation, and physical activity to prevent progression to Type 2 diabetes. The lifestyle modification program was presented to three panels of experts and feedback was given using the Likert-type scale questions. Then the pretest questions were administered to the clinic staff participants followed by the presentation of the PowerPoint and then Posttest questions was answered by all the participants. However, the results of the pretest and posttest indicated knowledge improvement after the presentation of the educational program. I presented and analyzed the result of the educational project in Section 4 as well as project strengths, limitations, and recommendations. In Section 5, I will discuss plans for the dissemination of the project and self-analysis.

# Section 5: Dissemination Plan

Dissemination is considered an important part of any DNP project because it helps expose a larger audience to the information. According to Marín-González, Malmusi, Camprubí, and Borrell (2017), dissemination and communication of a research project help to increase the discernibility of research outputs, engage the public in science and innovation, and bolster the confidence of society in research. Successful dissemination of research is fundamental to making sure the research has a social, political, or economical influence on people. Dissemination draws the attention of stakeholders to the research's outcomes and conclusions, augmenting their perceptibility, knowledge, and execution of the research (Marín-González et al., 2017). Educating nurses on lifestyle modification to prevent prediabetes progressing to Type 2 diabetes will help to address the practice gap and improve patient outcome. In this section, I will discuss plan for dissemination and analysis of self.

## Project Dissemination

I met with the project team of stakeholders in the clinic and shared my findings in a handout. The project's education program will be used in the medical clinic during in-service trainings for nurses and new staff orientations. I have plans to present the educational program annually to the Nigerian Nurses Association.

## Analysis of Self

Dissemination of nursing knowledge is essential for advanced practice nurses. Being able to contribute, successfully use, and transfer knowledge to nurses, interdisciplinary and interdisciplinary associates, stakeholders, and the public through

meetings, PowerPoint presentations, and interviews is crucial for the nursing profession. Dissemination relates to my development as a nurse leader by motivating individuals on lifestyle modification to prevent prediabetes from progressing to Type 2 diabetes. Developing an educational module for preventing Type 2 diabetes has confirmed my competence as a project manager. As a nurse practitioner, I understand the importance of educating patients on preventing the progression of prediabetes to Type 2 diabetes. I see increasingly more patients who are prediabetic, and when I educate them about lifestyle modifications, their Hemoglobin A1C decreases. Therefore, I am using such evidence to show that my practice is making a difference.

## Summary

Nurses must be prepared and guided by information and knowledge of current EBP, educating themselves on the benefits of patient lifestyle modifications, such as diet, smoking cessation, and physical activity, to prevent prediabetes from progressing to Type 2 diabetes. I have developed an educational program for nurses that can be implemented to improve the health outcome of prediabetes patients. The program will be implemented after my graduation from the DNP program. However, I will follow up with the clinic's medical director after graduation on the status of the educational program.

# References

Abdallah, M. A., Ahmed, K. M., Stevens, D., & Griebeler, M. (2019). Screening for impaired glucose tolerance (prediabetes) and prevention of Type 2 diabetes. *South Dakota Medicine, 72*(2), 67–73. Retrieved from https://www.sdsma.org/SDSMA/Publications/South_Dakota_Medicine.aspx

Abraham, A., Chaney, S., Huffman, A., & Kremer, K. (2015). Prediabetes and metabolic syndrome current trend. *Clinician Reviews, 25*(10), 42–49. Retrieved from https://www.mdedge.com/clinicianreviews

Alotaibi, A., Gholizadeh, L., Al-Ganmi, A. H. A., & Perry, L. (2018). Factors influencing nurses' knowledge acquisition of diabetes care and its management: A qualitative study. *Journal of Clinical Nursing*, *27*(23–24), 4340–4352. doi:10.1111/jocn.14544

American Diabetes Association. (2011). Diabetes statistics. Retrieved fromhttp://www.diabetes.org/diabetes-basics/diabetes-statistics/

American Diabetes Association (2017). Standards of medical care in diabetes—2017: Summary of revisions. *Diabetes Care, 40*. Retrieved fromhttp://care.diabetesjournals.org/content/40/Supplement_1/S4

American Heart Association (2015). Cardiovascular disease &diabetes. Retrieved fromhttps://www.heart.org/en/health-topics/diabetes/why-diabetes matters/cardiovascular-disease--diabetes

American Heart Association (2015). Neuropathy &diabetes. Retrieved fromhttps://www.heart.org/en/health-topics/diabetes/about-

diabetes/complications-to-avoid-with-prediabetes

American Heart Association (2016). Kidney disease &diabetes. Retrieved from https://www.heart.org/en/health-topics/diabetes/why-diabetes-matters/kidney-disease--diabetes

American Heart Association (2015). Complications to avoid with pre-diabetes. Retrieved fromhttps://www.heart.org/en/health-topics/diabetes/about-diabetes/complications-to-avoid-with-prediabetes

Antonia-Rodriguez, M., Friedberg, J. P., DiGiovanni, A., Binhuan Wang, Wylie-Rosett, J., Sangmin Hyoung, & Natarajan, S. (2019). A tailored behavioral intervention to promote adherence to the DASH diet. *American Journal of Health Behavior, 43*(4), 659–670. doi:10.5993/AJHB.43.4.1

Brouns, F. (2018). Overweight and diabetes prevention: Is a low-carbohydrate-high-fat diet recommendable? *European Journal of Nutrition, 57*(4), 1301–1312. doi:10.1007/s00394-018-1636-y

Brown, C. G. (2014). The Iowa model of evidence-based practice to promote quality care: An illustrated example in oncology nursing. *Clinical Journal of Oncology Nursing, 18*(2), 157–159. doi: 10.1188/14.CJON.157-159

Buckwalter, K. C., Cullen, L., Hanrahan, K., Kleiber, C., McCarthy, A. M., Rakel, B., & Tucker, S. (2017). Iowa model of evidence-based practice: Revisions and validation. *Worldviews on Evidence-Based Nursing, 14*(3), 175–182. doi:10.1111/wvn.12223

Centers for Disease Control and Prevention. (2016). Road to Health user's guide.

Retrieved from https://www.cdc.gov/diabetes/ndep/toolkits/road-to-health.html

Centers for Disease Control and Prevention. (2008). Road to Health user's guide.Retrieved from http://media/road-to-health-toolkit-users-guide.pdf

Das, S., Rouseff, M., Guzman, H. E., Osondu, C. U., Brown, D., Betancourt, B., … Veledar, E. (2019). The impact of lifestyle modification on cardiometabolic risk factors in healthcare employees with Type 2 diabetes. *American Journal of Health Promotion, 33*(5), 745–748. doi:10.1177/0890117118823164

Gerlanc, N. M., Cai, J., Tkacz, J., Bolge, S. C., & Brady, B. L. (2017). The association of weight loss with patient experience and outcomes in a population of patients with Type 2 diabetes mellitus prescribed canagliflozin. *Diabetes, Metabolic Syndrome and Obesity: Targets and Therapy*, 89. doi:10.2147/DMSO.S129824

Glechner, A., Keuchel, L., Affengruber, L., Titscher, V., Sommer, I., Matyas, N., &Gartlehner, G. (2018). Effects of lifestyle changes on adults with prediabetes: A systematic review and meta-analysis. *Primary Care Diabetes, 12*(5), 393–408.doi: 10.1016/j.pcd.2018.07.003

Grove, S., Burns, N., & Gray, J. (2013). *The practice of nursing research: Appraisal, synthesis and generation of evidence* (7th ed.). St. Louis, MO: Saunders Elsevier.

Healthy People 2020. (2017). Topics & objectives index. Retrieved fromhttps://www.healthypeople.gov/2020/topics-objectives

Healthy People 2020. (2019). Diabetes. Retrieved from https://www.healthypeople.gov/2020/topics-objectives/topic/diabetes

Hu, S. H., Yang, Z. L., Chuang, Y.-H., & Liu, M. F. (2018). Registered

nurses'knowledge of medical care for older adults with diabetes in long-term carefacilities in Taiwan. *Collegian, 25*(3), 271–275. doi: 10.1016/j.colegn.2017.07.003

International Diabetes Federation. (2019). Diabetes prevention.Retrieved from https://www.idf.org/aboutdiabetes/prevention.html

Jackson, S. L., Staimez, L. R., Safo, S., Long, Q., Rhee, M. K., Cunningham, S. A., … Phillips, L. S. (2017). Participation in a national lifestyle change program is associated with improved diabetes control outcomes. *Journal of Diabetes & Its Complications, 31*(9), 1430–1436. doi: 10.1016/j.jdiacomp.2017.06.001

Jose, J., & Thomas, N. (2018). How should one tackle prediabetes in India? *The Indian Journal of Medical Research, 148*(6), 675–676. doi: 10.4103/ijmr.IJMR_1785_18

Khan, R., Khan, S., Gul, S., Kanwal, S., Samin, A., & Ahmed, A. (2017). Pre-diabetes: Prevalence in students of Ayub Medical College, Abbottabad. *Professional Medical Journal, 24*(8), 1190–1194. doi:10.17957/TPMJ/17.3880

Kleier J., & Welch-Dittman, P. (2014). Attitude and empowerment as predictors of self-reported self-care and A1C values among African Americans with diabetes mellitus. *Nephrology Nursing Journal, 41*(5), 487. Retrieved from https://www.annanurse.org/resources/products/nephrology-nursing-journal

Magliano, D. J., Martin, V. J., Owen, A. J., Zomer, E., & Liew, D. (2018). The productivity burden of diabetes at a population level. *Diabetes Care, 41*(5), 979. doi:10.2337/dc17-2138

Mao, W., Yip, C.-M. W., & Chen, W. (2019). Complications of diabetes in China: Health

system and economic implications. *BMC Public Health, 19*(1), 269. doi:10.1186/s12889-019-6569-8

Marín-González, E., Malmusi, D., Camprubí, L., & Borrell, C. (2017). The role of dissemination as a fundamental part of a research project. *International Journal Of Health Services, 47*(2), 258–276. doi:10.1177/0020731416676227

Mishra, P., Pandey, C. M., Singh, U., Gupta, A., Sahu, C., & Keshri, A. (2019). Descriptive statistics and normality tests for statistical data. *Annals of Cardiac Anaesthesia, 22*(1), 67–72. doi: 10.4103/aca.ACA_157_18

Navarro-Perez, J., Orozco-Beltran, D., Gil-Guillen, V., Pallares, V., Valls, F., Fernandez, A., … ESCARVAL Study Grp. (n.d.). Mortality and cardiovascular disease burden of uncontrolled diabetes in a registry-based cohort: the ESCARVAL-risk study. BMC Cardiovascular Disorders, 18. https://doi-org.ezp.waldenulibrary.org/10.1186/s12872-018-0914-1

Nhim, K., Khan, T., Gruss, S. M., Wozniak, G., Kirley, K., Schumacher, P., … Albright, A. (2018). Primary Care Providers' Prediabetes Screening, Testing, and Referral Behaviors. American Journal of Preventive Medicine, 55(2), e39–e47. https://doi-org.ezp.waldenulibrary.org/10.1016/j.amepre.2018.04.017

Nwankwo, R., & Funnell, M. (2017). WHAT'S NEW IN NUTRITION for Adults with Diabetes? Home Healthcare Now, 35(7), 386–390. https://doi-org.ezp.waldenulibrary.org/10.1097/NHH.0000000000000576

Phillips, L. S., Ratner, R. E., Buse, J. B., & Kahn, S. E. (2014). We can change the natural history of Type 2 diabetes. Diabetes Care, 37(10), 2668-2676.

doi:10.2337/dc14-0817

Rahmati-Najarkolaei, F., Pakpour, A. H., Saffari, M., Hosseini, M. S., Hajizadeh, F., Hui, C., & Yekaninejad, M. S. (2017). Determinants of Lifestyle Behavior in IraniAdults with Prediabetes: Applying the Theory of Planned Behavior. Archives of Iranian Medicine (AIM), 20(4), 198-204.

Rariden, C., Lavin, M., & Yun, S. (2015). Improving Prediabetes Screenings at Rural Missouri County Health Departments. Journal of Community Health, 40(6)1107-1114. doi:10.1007/s10900-015-0036-y

Sebire, S. J., Toumpakari, Z., Turner, K. M., Cooper, A. R., Page, A. S., Malpass, A., &Andrews, R. C. (n.d.). "I've made this my lifestyle now": a prospective qualitative study of motivation for lifestyle change among people with newly diagnosed type two diabetes mellitus. BMC PUBLIC HEALTH, 18. https://doi-org.ezp.waldenulibrary.org/10.1186/s12889-018-5114-5

Silva Paraizo, C. M., Gabriely Isidoro, J., de Souza Terra, F., Rezende Dázio, E. M., Barbosa Felipe, A. O., & Coelho Leite Fava, S. M. (2018). Knowledge of the Primary Health Care Nurse about Diabetes Mellitus. Journal of Nursing UFPE / Revista de Enfermagem UFPE, 12(1), 179–188. https://doi-org.ezp.waldenulibrary.org/10.5205/1981-8963-v12i1a23087p179-188-2018

Sweileh, W. M. (2018). Analysis of global research output on diabetes depression and suicide. Annals of General Psychiatry, 17(1), N.PAG. https://doi-org.ezp.waldenulibrary.org/10.1186/s12991-018-0214-2

Thaane, T., Motala, A. A., & Mckune, A. J. (2019). Lifestyle modification in the

management of insulin resistance states in overweight/obesity: the role of exercise training. *Journal of Endocrinology, Metabolism & Diabetes of South Africa*, *24*(2), 65–69. https://doi-org.ezp.waldenulibrary.org/10.1080/16089677.2019.1608054

Trief, P. M., Cibula, D., Delahanty, L. M., & Weinstock, R. S. (2017). Self-determination theory and weight loss in a Diabetes Prevention Program translation trial. *Journal of Behavioral Medicine*, *40*(3), 483–493. https://doi-org.ezp.waldenulibrary.org/10.1007/s10865-016-9816-9

Weisenberger, J. (2019). How to Halt Prediabetes: Prediabetes is a serious risk factor for developing Type 2 diabetes. Environmental Nutrition, 42(6), 6.

World Health Organization. (2011). Social determinants of health: Key concepts. Retrieved from http://www.who.int/social_determinants/thecommission/finalreport/key_concepts/en/index.html

World Health Organization (2016). Physical Activity. Retrieved from http://www.who.int/entity/mediacentre/factsheets/fs385/en/

Wojciechowski, E., Pearsall, T., Murphy, P., & French, E. (2016). A Case Review: Integrating Lewin's Theory with Lean's System Approach for Change. Online Journal of Issues in Nursing, 21(2), 1. doi:10.3912/OJIN.Vol21No02Man04

Youngs, W., Gillibrand, W., & Phillips, S. (2016). The impact of pre-diabetes diagnosis on behavior change: an integrative literature review. Practical Diabetes, 33(5), 171–175. https://doi-org.ezp.waldenulibrary.org/10.1002/pdi.2030

Appendix A: Lifestyle Modification Toolkit for Nurses Use to Prevent Prediabetes Progressing to Type 2 Diabetes

# Lifestyle Modification Toolkit for Nurses' Use to Prevent Prediabetes Progressing to Type 2 Diabetes

# Interventions to prevent Diabetes for healthcare providers

## Scope and Purpose of the Educational Program

The toolkit is to teach the nurses' lifestyle modifications to prevent prediabetes from progressing to Type 2 diabetes. The guideline contains recommendations by the CDC (CDC, 2016), and EBP guidelines on lifestyle modifications such as diet and exercises to prevent prediabetes from advancing to Type 2 diabetes. The toolkit designed considering the experience level of individual nurses based on their knowledge, judgment, and skills. The toolkit is a staff educational tool to be used by the nurses to teach prediabetes patients lifestyle modifications to prevent progressing to Type 2 diabetes. The outcome of this guideline is to increase the knowledge of the nurses' in the medical clinic to be better equipped to teach prediabetes patients for better patient care.

## Goals

- Educate nurses on the importance of lifestyle modifications for patients with prediabetes
- Discuss the risk factors associated with prediabetes and diabetes
- Reducing the burden of diabetes by addressing lifestyle modifications in prediabetes patients.
- Better patient treatment outcome hence reducing the rate of hospitalization.
- Decrease the chances of prediabetes progressing to Type 2 diabetes
- Increase awareness of the importance of lifestyle modifications including smoking cessation, healthy eating, and physical activity

- Staff should be trained during orientation and annual in-service on lifestyle modifications to prevent prediabetes from progressing to Type 2 diabetes

**Explain**

- Prediabetes
- Diabetes

**Risk factors of Prediabetes and Type 2 Diabetes**

- Sedentary lifestyle
- Cigarette smoking
- Poor eating habit by eating a lot of carbohydrate diet which increases blood glucose

**Complications of Type 2 Diabetes**

- Cardiovascular disease: High blood glucose increases plaque buildup in the arteries. Therefore, the plaque makes it difficult for blood to flow or even block the arteries
- Diabetic neuropathy: When high levels of blood glucose go through blood vessels, nerve damage occurs.
- Diabetic nephropathy: One of the long- term complications of diabetes is kidney damage.
- Diabetic Retinopathy: This diabetes risk causes damage to the vessels around the eyes due to elevated blood glucose.

Appendix A: Educational Toolkit
PowerPoint slides

# Lifestyle modification toolkit for nurses' use to prevent prediabetes progressing to type 2 diabetes

## Learning Objective

- Describe prediabetes and the risk factors
- Identify three evidence-based practice ideas on how to prevent type 2 diabetes
- Explain the significance of preventing or delaying type 2 diabetes
- Explain the importance of lifestyle modifications: smoking cessation, eating healthy diet and physical activity

# Program Overview

- Welcome and Introduction
- Will meet 60 – 90 minutes
- Goal: lose weight with healthy eating
- 150 minutes a week of moderate physical activity
- Smoking cessation
- Monitoring blood glucose
- All helps to decrease chances of prediabetes progressing to type 2 diabetes

# Is prediabetes and diabetes a problem?

- Prediabetes is on the rise worldwide.
- Thirty-seven percent of adults aged 20 years and above are being affected by prediabetes in the United States (Rariden, Lavin, & Yun, 2015).
- Complications of diabetes such as cardiovascular disease, diabetic retinopathy, and blindness
- Most impacted are Native Americans, Non-Hispanic blacks, and Hispanics

# Who is at Risk for prediabetes and type 2 diabetes

- All individual with pre-diabetes (high blood sugar or HgA1C but not high enough to be diagnosed)
- Smokers
- Obese individuals

# Section 1: Diabetes is Preventable

- Pre-test
- Preventing type 2 diabetes
- Complications of diabetes
- How to prevent prediabetes progressing to type 2 diabetes
  - Road-to-health toolkit Activity
- Intervention
- **Activity 1: Portion Distortion**
- **Portion control: "downsize," not "super-size"**
- Larger portions contribute to eating too many calories in a day.
- Single portion should not provide enough food for two people.
- Increase portion size relates to increases in body weight— both of which increase the risk of developing type 2 diabetes.
- **Steps/intervention**
- A closed fist is an estimated serving of starches,
- An open palm of the hand is a serving of meat,
- A cupped hand is a serving of vegetables,
- The end of the thumb is a serving of cheese. For some of us, our thumbprint is about the size of a teaspoon; for others, our thumbprint is about the size of a tablespoon (CDC, 2016).
- **Intervention: Nurses should demonstrate portion control with their hands**

# Section 2: Food Choices

- Reading labels
- Finding hidden fats
- Fast food "value" meals
- Portion Sizes
- Drink more water and less soda or juice

**Activity 2: Community water log**

- **Set a goal of drinking more water and less soda or juice**
- Water is necessary to stay healthy.
- Water has no calories but soda or juice has a lot of extra calories
- Juice has more nutrients than soda; it is also loaded with sugar and calories.
- Even all-natural or no-sugar-added juice has natural sugar.
- Drinks with added and natural sugars should be limited.

- **Steps/intervention**
- Have participants write the number of glasses of water they drink each day (Remember: the goal is at least eight 8-ounce glasses a day and 1 gallon = sixteen 8-ounce glasses).
- Encourage participants to set realistic goals for drinking water each day (CDC, 2016).

# Section 3: Increase physical Activity

- Moving more
- Barriers and excuses

**Activity 3: A journey of two**

- **Making physical activity part of your daily schedule – select a walking buddy**
- Schedule 30 minutes for physical activity every day
- With good planning people with busy schedule can make time out for physical activity
- It can be before or after work or meals

**Suggestions:**

- Park the car far away from your destination.
- Get on or off the bus several blocks away.
- Take the stairs instead of the elevator or escalator.
- Play with children or pets.
- Take fitness breaks—walking or doing desk exercises—instead of taking cigarette breaks.
- Dance to music.
- Start out slowly then add few minutes every day.
- Reward and acknowledge the efforts you see people make.

- **Intervention:** Have participants write their schedule and when they can make out time for physical activity

# Setting goals and rewards

- Smoking Cessation-
  - Smoking damages the Pancreas
  - smoking cessation to reduce their risks of prediabetes and type 2 diabetes
- Summary
- Rewards of a healthier lifestyle-setting goals
- Post-test
- Evaluation


Appendix B: Toolkit Educational Questionnaire—Expert Panel Questions

Kindly read the following statements and check the appropriate box to evaluate the content of the program regarding the lifestyle modification that will be used to educate nurses in the clinic on how to prevent the progression of prediabetes to Type 2 diabetes. Responses will be kept confidential and anonymous.

Kindly use the following scale for your responses.

1=Strongly disagree 2=Disagree 3=Neutral 4=Agree 5=Strongly Agree

| | | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|---|
| 1 | Staff participation in this lifestyle modification program will help to improve patients' care in the clinic | | | | | |
| 2 | This educational program will help to improve the knowledge of the staff | | | | | |
| 3 | The content of the lifestyle modification toolkit will be easy to understand by the clinic staff | | | | | |
| 4 | The content of the lifestyle modification program will help nurses to provide evidence- based care to the patients' | | | | | |
| 5 | The style of the PowerPoint presentation of the instructor will be easy for the staff to understand the content | | | | | |
| Overall comments: | | | | | | |

Appendix C: Toolkit Educational Questionnaire - Pretest and Posttest Questions

Kindly read the following statements and check the appropriate box that corresponds to your skills, level of knowledge and confidence regarding the lifestyle modification program for pre-diabetic patient. Responses will be kept confidential and anonymous.

Kindly use the following scale for your responses.

1= Strongly disagree 2=Disagree 3=Neutral 4=Agree 5=Strongly Agree

| | | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|---|
| 1 | The education on patient lifestyle modifications changed my attitude on the importance of healthy eating and physical activity | | | | | |
| 2 | Sedentary lifestyle and obesity can increase risk of Type 2 diabetes | | | | | |
| 3 | Type 2 diabetes has serious consequences such as kidney failure, blindness, loss of toes, feet, and legs | | | | | |
| 4 | Educating patients on lifestyles modifications may help to prevent prediabetes progressing to Type 2 diabetes | | | | | |
| 5 | Staff should receive annual education on lifestyle modifications such as diet, smoking cessation, and physical activity for patients with pre-diabetes or diabetes. | | | | | |
| Overall comments: | | | | | | |